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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)

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT UNIT 2

VOL. 1 OF 2

NRC DOCKET NO. 50-328

NRC TAC NO. 50328

NRC CONTRACT NO. NRC-03-79-118

FRC PROJECT C5257

FRC ASSIGNMENT 13

FRCTASK 526

Prepared by

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

FRC Group Leader: G. J. Toman

Prepared for

Nuclear Regulatory Commission Washington, D.C. 20555

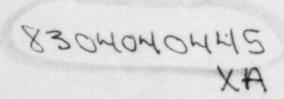
Lead NRC Engineer: P. Shemanski

March 31, 1983

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Reviewed by:

Group Leader

Approved b

Project Manager

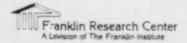
Department Director

Franklin Research Center

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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

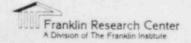
The purpose of this report is to:

- 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) [5],* 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 [9] 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.

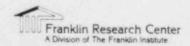
The NRC has determined that the evaluation of environmental qualification of equipment items (1) located in plant areas whose environment is not adversely affected by the design basis event (DBE) (e.g., equipment located in "mild" environments) or (2) required to achieve and maintain cold shutdown, is 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 bac's 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.

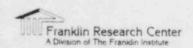


Of particular concern is the assurance that equipment will remain operable during and following exposure to the harsh environmental conditions (i.e., temperature, pressure, humidity [steam], chemical sprays, radiation, and submergence) imposed as a result of a design basis accident. These harsh environments 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 Jechnical Activity A-24,



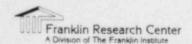
"Qualification of Class IE Safety Related Equipment." The positions documented therein are applicable to plants that are or will be in the construction permit or operating license review process.

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

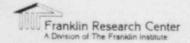


licensing criteria. The subject of electrical equipment environmental qualification (SEP Topic III-12) was selected for accelerated evaluation as part of this program. Seismic qualification of equipment was to be addressed as a separate SEP topic. In December 1977, the NRC issued a generic letter to 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" [1]. (The document is hereafter

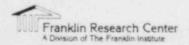


referred to as the "DOR Guidelines.") The document was prepared as a screening standard for reviewing all operating plants, including SEP plants. It was originally intended that the licensees evaluate their qualification documentation in accordance with the DOR Guidelines. However, initial NRC review 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.

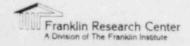


On February 21, 1980, the NRC and representatives of the SEP Plant Owners Group held an open meeting at NRC headquarters to discuss an accelerated review program in accordance with the DOR Guidelines. Representatives of the Indian Point Units and Zion Station also attended this meeting. The NPC formally 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" [1], 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 [6], 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

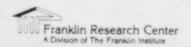


Design Criteria for an interim period. Rulemaking was proposed for the purpose of establishing a permanent interpretation of the General Design Criteria.

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 NURE 0588 as required by IE Bulletin 79-01B. The NRC was to perform an audit of the qualification documentation references as part of its Safety Evaluation Program. If discrepancies were found, the audit was to be extended. The plants included within this assignment were Nine Mile Point Unit 1, Millstone Unit 2, Salem Unit 1, Browns Ferry Units 1, 2, and 3, Brunswick Units 1 and 2, Hatch Units 1 and 2, Dresden Unit 3, and Quad Cities Units 1 and 2. (This assignment was completed in June 1981.)

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



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

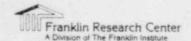
In May 1981, under the licensing action assistance contract, NRC authorized Franklin Research Center to proceed with the review and evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments, required for TMI Lessons Learned Implementation on 71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

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

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

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

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



guidelines for meeting the NRC Commissioners proposed rule on equipment qualification.

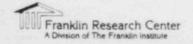
On April 20, 1982, the NRC staff issued Generic Letter No. 82-09 [7] to all licensees, presenting the NRC's position and clarification of certain aspects of the environmental qualification requirements.

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

1.4 SPECIFIC ISSUE BACKGROUND

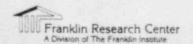
On May 31, 1978, the NRC Office of Inspection and Enforcement issued IE Circular 78-08, "Environmental Qualification of Safety-Related Electrical Equipment at Nuclear Power Plants," which required all licensees of operating plants to examine their installed safety-related electrical equipment and ensure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

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



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

The NRC Office of Inspection and Enforcement performed an onsite verification inspection (during the week of December 15, 1980) of selected safety-related electrical equipment. Selected components in the emergency raw cooling water, feedwater, and component coolant water systems were inspected at Unit 1, and selected components in the reactor coolant, emergency raw cooling water, and chemical and volume control systems were inspected at Unit 2. This inspection specified proper installation of equipment, overall interface integrity, and manufacturer's nameplate data. The manufacturer's mame 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 for Unit 1 in report IE 50-327/80-48 and for Unit 2 in report IE 50-328/80-26. All significant deficiencies were noted. For this review, the documents referenced above have been factored into the overall staff evaluation. The NRC Office of Nuclear Reactor Regulation performed audits on August 5 and 6, 1980 and December 17-19, 1980 of environmental qualification documentation and/or test data for 18 items in Unit 1. because equipment in Units 1 and 2 is essentially identical, with few exceptions, the results of the Sequoyah Unit 1 audits may be applied to Unit 2. No significant concerns were identified during the IE inspection or the NRR audits.



The NRC issued a Safety Evaluation Report (SER) to the Tennessee Valley Authority in 1981 [10].

Requests for information [24, 25, 26, 27] 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 [9].

By letters dated September 25, 1981 [11] and January 19, 1982 [13], the Tennessee Valley Authority transmitted to the NRC a response to the SER.

On April 7, 1982 [15] and July 16, 1982 [23], the Tennessee Valley Authority provided responses to the FRC requests for additional information.

2. NRC CRITERIA FOR ENVIRONMENTAL QUALIFICATION

2.1 CRITERIA PROVIDED BY THE NRC

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

- o DOR Guidelines, "Guidelines for Evaluating Environmental Qualification of Class lE Electrical Equipment in Operating Reactors," November 1979 [1]
- o NUREG-0588, Revision 1, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," July 1981 [8].

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

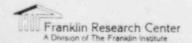
- o IE Bulletin 79-01B, "Environmental Qualification of Class 1E Equipment," January 14, 1980; Supplement No. 1, February 29, 1980; Supplement No. 2, September 29, 1980; and Supplement No. 3, October 24, 1980 [2, 3, 4, 5]
- o NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980 [9]. 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 [4] 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

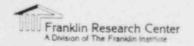
REQUIREMENTS

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

REPLACEMENT COMPONENTS USE NUREG-0588 (CAT. I)

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

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



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

[Question 17]

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

[NRC Answer to Question 17]

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

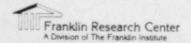
2.2.2 Application of Requirements and Criteria to TMI Lessons Learned Implementation Equipment

The NRC requested an evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation in accordance with criteria established by the NRC in a manner identical to the evaluation of all other safety-related electrical equipment. Additionally, Item 21 of Supplement 2 to IE Bulletin 79-01B [4] 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 [5] 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

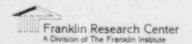


'planned' to be installed as a result of lessons learned need not be addressed in that response. Some of this equipment has since been installed. Supplement #2 (Q.5, Q.21) identified that the staff position was that equipment which is installed should be treated in a manner similar to all other safety-related 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 [4] 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 [5] 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

4

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

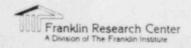
For pressurized water reactors (PWRs), the DOR Guidelines state that the containment temperature and pressure conditions as a function of time should be based on the most recent NRC-approved service conditions specified in the Final Safety Analysis Report (FSAR) or other licensee documentation. In the 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 [4], "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 [4] 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 [4] provides the following additional criterion:

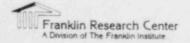
"Equipment designed to perform its safety-related function within a short time into an event must be qualified for a period of at least 1 hour in excess of the time assumed in the accident analysis. The staff has indicated that time is the most significant factor in terms of the margins required to provide 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 [4] 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 [4] provides the following additional criteria:

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

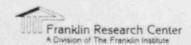
NUREG-0578 provides the radiation source term to be used for determining the qualification doses for equipment in close proximity to recirculating fluid systems inside and outside of containment as a result of LOCA. This method considers a LOCA event in which the primary system may not depressurize and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

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

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

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

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



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

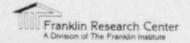
2.2.5 Additional Clarification of Qualification Requirements

The NRC has worked with a number of licensees, at their requests, to provide further clarification on environmental qualification requirements. On January 20, 1982, the NRC issued Generic Letter No. 82-09 [7] presenting staff positions on certain aspects of the qualification requirements. Generic Letter No. 82-09 states:

"1. Operator Display Instrumentation

- Q. Given the interrelated activities associated with display instrumentation (e.g., NUREG-0700, NUREG-0799, proposed Regulatory Guide 1.97 and Equipment Qualification efforts), what display instrumentation referenced in emergency operating procedures must be identified in licensee submittal to the NRC?
- A. All display instrumentation referenced in the emergency procedures need not be identified. The NRC requires that licensees need only identify and have available qualification documentation on those operator display instruments which are safety-related (see Question 2). If licensees have previously supplied a listing of all display instrumentation referenced in emergency procedures, licensees may identify (such as by the use of an *) which of those instruments are safety-related. The staff will defer review of the basis for this safety-related classification until other NRC activities 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.

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



- 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:

- 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.
- 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.
- 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 x 107 rads applicable to all operating reactors?
- A. No. This screening value is applicable only to PWRs with dry type containments. However, for PWRs with dry type containments, the licensee may choose to use plant specific analysis instead of the screening value. For plants with other containment types, the licensee must use plant specific analysis.

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

7. Containment Service Conditions

- Q. Must the Staff value (identified in the SERs) of $T_{\rm SAT}$ for PWRs and $T_{\rm SAT}$ + 20°F for BWRs be used as the maximum in-containment temperature for the purpose of equipment qualification?
- A. No. The Staff will accept the use of these values. However, an acceptable alternative to the NRC staff's temperature criterion used for the service conditions must base that service condition on the FSAR analysis or other NRC approved analysis, provided that the specific analysis, or a summary of that analysis, together with reference to the previous NRC acceptance of the analysis is submitted by the licensee. In addition, some of the information in the associated safety evaluation may require clarification.
- 8. One Hour Minimum Operating Time
- Q. The Staff has previously indicated that certain exceptions to the one hour minimum operating time rule are permitted. Can further clarification be provided?



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

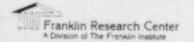
The one hour time margin rule is not applicable to equipment whose safety function is performed prior to significant changes in the environment at the equipment location.

9. Aging

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

An acceptable method for addressing in-service degradation is through a preventive maintenance/surveillance program with equipment and component refurbishment and/or replacement hased 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 T - Temperature

QT - Qualification Time

RT - Required Time

P - Pressure H - Humidity

CS - Chemical Spray

A - Material Aging Evaluation, Replacement Schedule, Ongoing Equipment Surveillance

S - Submergence

(R) - Licensee has committed to replace equipment M - Margin

I - HELB Evaluation Outside Containment Not Completed

QM - Qualification Method

RPN - Equipment Relocation or Replacement, Adequate Schedule Not Provided

EXN - Exempted Equipment Justification Inadequate

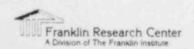
SEN - Separate Effects Qualification Justification Inadequate

QI - Qualification Information Being Developed

RPS - Equipment Relocation or Replacement Schedule Provided

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

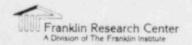
The Licensee, The Tennessee Valley Authority, provided a response to the SER and additional qualification information in its submittals [11, 13] to the NRC for the Sequoyah Nuclear Plant Unit 2.

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.

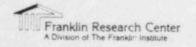


"equipment item." In this report, the term "equipment item" refers to a specific type of electrical equipment, designated by manufacturer and model, which is representative of all identical equipment in a plant area exposed to the same environmental service conditions (e.g., Flow Transmitter, Fischer & 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.

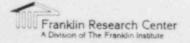


Topics not within the scope of the evaluation are:

- 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

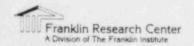
II.K.3.21 (BWR/GE/7-1-18) Restart of Core Spray and LPCI Systems (If Hardware Changed Cut)

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 Quest 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 N. PEG-0588 as required by IE Bulletin 75-01B. For these 13 plants and all o her 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 la, reproduced here as Figure 3-1.

The checksheets contain the following information:

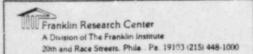
o Equipment item information (see Figure 3-1), for example:

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
- 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





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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

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

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

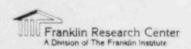
R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checkshest Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	16
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 la "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

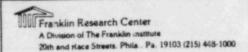
This category includes equipment items which are fully acceptable on the basis that all applicable criteria defined in the DOR Guidelines or NUREG-0588 are (1) satisfied and the equipment has been found to be qualified or (2) sufficient information has been presented to determine that deviations from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





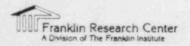
NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _____

Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. __

	Di	SIGNATION:
	X ·	DEFICIENCY
RC REQU	IREMENTS	
ocument	ed Evidence of Qualification Adequate	
dequate	Similarity Between Equipment and Test Specimen Established	
Da	aradation Evaluated Adequately	-
unlifte	d Life or Replacement Schedule Established (If Required)	
rogram	Established to Identify Aging Degradation	=
riteria	Regarding Aging Simulation Satisfied (If Required)	
riteria	Regarding Temperature/Pressure Exposure:	
0 P	eak Temperature Adequate	
0 2	war Pressure Adequate	
0 0	Required Profile Enveloped Adequately	
0 8	Steam Exposure (If Required) Adequate	
riteria	Regarding Spray Satisfied	
riteria	Regarding Submergence Satisfied	
Criteria	Regarding Radiation Satisfied	_
	Regarding Test Sequence Satisfied	
ritoria	regarding test sequence	
Criteria Criteria	Regarding Test Failures or Severe Anomalies	
Criteria Criteria (If An	Regarding Test Failures or Severe Anomalies	
Criteria Criteria (If Ar	Regarding Test Failures or Severe Anomalies ny) Satisfied Regarding Functional Testing Satisfied	=
Criteria Criteria (If Ar Criteria Criteria	Regarding Test Failures or Severe Anomalies ny) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied	=
Criteria Criteria (If Ar Criteria Criteria	Regarding Test Failures or Severe Anomalies ny) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied Regarding Margin (1 hour + Function Time) Satisfied	=
Criteria Criteria (If Ar Criteria Criteria	Regarding Test Failures or Severe Anomalies ny) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied	
Criteria Criteria (If Ar Criteria Criteria	Regarding Test Failures or Severe Anomalies ny) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied Regarding Margin (1 hour + Function Time) Satisfied	DESIGNATIO
Criteria Criteria (If Ar Criteria Criteria Test Dur Criteria	Regarding Test Failures or Severe Anomalies ny) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied ration Margin (1 hour + Function Time) Satisfied Regarding Margins Satisfied (NUREG-0588, Cat. I)	
Criteria Criteria (If Ar Criteria Criteria Test Dur Criteria	Regarding Test Failures or Severe Anomalies ny) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied ration Margin (1 hour + Function Time) Satisfied Regarding Margins Satisfied (NUREG-0588, Cat. I) LIFICATION CATEGORY	DESIGNATIO
Criteria Criteria (If Ar Criteria Criteria Test Dur Criteria NRC QUA)	Regarding Test Failures or Severe Anomalies (hy) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied ration Margin (1 hour + Function Time) Satisfied Regarding Margins Satisfied (NUREG-0588, Cat. I) LIFICATION CATEGORY Equipment Qualified	DESIGNATIO
Criteria Criteria (If Ar Criteria Criteria Criteria Test Dur Criteria NRC QUA	Regarding Test Failures or Severe Anomalies (hy) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied ration Margin (1 hour + Function Time) Satisfied Regarding Margins Satisfied (NUREG-0588, Cat. I) LIFICATION CATEGORY Equipment Qualified Equipment Qualification Pending Modification	DESIGNATIO X = CATEGO
Criteria Criteria (If Ar Criteria Criteria Test Dur Criteria NRC QUA	Regarding Test Failures or Severe Anomalies (hy) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied ration Margin (1 hour + Function Time) Satisfied Regarding Margins Satisfied (NUREG-0588, Cat. I) LIFICATION CATEGORY Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established	DESIGNATIO X = CATEGO
Criteria Criteria (If Ar Criteria Criteria Criteria Criteria Criteria Indiana I.a I.b II.a II.b	Regarding Test Failures or Severe Anomalies (hy) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied ration Margin (1 hour + Function Time) Satisfied Regarding Margins Satisfied (NUREG-0588, Cat. I) LIFICATION CATEGORY Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified	DESIGNATIO X = CATEGO
Criteria Criteria (If Ar Criteria Criteria Test Dur Criteria NRC QUA	Regarding Test Failures or Severe Anomalies (hy) Satisfied Regarding Functional Testing Satisfied Regarding Instrument Accuracy Satisfied ration Margin (1 hour + Function Time) Satisfied Regarding Margins Satisfied (NUREG-0588, Cat. I) LIFICATION CATEGORY Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Not Qualified Equipment Satisfies Ail Requirements Except Qualified Life	DESIGNATIO X = CATEGO
Criteria Criteria (If Ar Criteria Criteria Criteria Criteria Criteria Institution II.a II.a II.b II.a II.b III.a	Regarding Test Failures or Severe Anomalies (a) Satisfied (a) Regarding Functional Testing Satisfied (a) Regarding Instrument Accuracy Satisfied (a) Regarding Instrument Accuracy Satisfied (a) Regarding Margins (1) hour + Function Time) Satisfied (a) Regarding Margins Satisfied (NUREG-0588, Cat. I) LIFICATION CATEGORY Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified Equipment Exempt From Qualification	DESIGNATIO X = CATEGO
Criteria Criteria (If Ar Criteria Criteria Criteria Criteria Criteria Institution II.a II.b II.c III.a III.b III.c	Regarding Test Failures or Severe Anomalies (a) Satisfied (a) Regarding Functional Testing Satisfied (a) Regarding Instrument Accuracy Satisfied (a) Regarding Instrument Accuracy Satisfied (a) Regarding Margins (1) hour + Function Time) Satisfied (a) Regarding Margins Satisfied (NUREG-0588, Cat. I) LIFICATION CATEGORY Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified Equipment Exempt From Qualification	DESIGNATIO X = CATEGO
Criteria Criteria (If Ar Criteria Criteria Criteria Criteria Criteria Institution II.a II.a II.b II.a II.b III.a	Regarding Test Failures or Severe Anomalies (a) Regarding Functional Testing Satisfied (a) Regarding Instrument Accuracy Satisfied (a) Regarding Instrument Accuracy Satisfied (a) Regarding Margins Satisfied (NUREG-0588, Cat. I) LIFICATION CATEGORY Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified Equipment Exempt From Qualification	DESIGNATIO X = CATEGO

Figure 3-2. Sample Checksheet Page 2
"Equipment Environmental Qualification Summary Form"



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

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

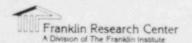
The qualification of equipment items in this category, in accordance with the requirements of the DOR Guidelines or NUREG-0588, is significantly deficient or inconclusive based upon review of (1) the documentation provided by the Licensee or (2) applicable and available qualification documentation associated 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 MRC Category II.c EQUIPMENT THAT SATISFIES ALL APPLICABLE REQUIREMENTS OF THE DOR GUIDELINES OR NUREG-0588 WITH THE EXCEPTION OF QUALIFIED LIFE

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



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

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

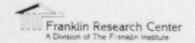
This category includes equipment items that are exempt from qualification on the basis that (1) the equipment does not provide a safety function (i.e., should not have been included in the equipment list submitted by the Licensee), or (2) the specific safety-related function of the equipment can be accomplished 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 safetyrelated 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 TE 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.

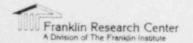
O NRC Category IV EQUIPMENT FOR WHICH QUALIFICATION DOCUMENTATION HAS NOT BEEN MADE AVAILABLE FOR REVIEW

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	NUMBER OF EQUIPMENT ITEMS
I.A	EQUIPMENT QUALIFIED	- 13
6.1	EQUIPMENT QUALIFICATION PENDING MODIFICATION	
11.A	EQUIPMENT QUALIFICATION NOT ESTABLISHED	- 62
8.11	EQUIPMENT NOT QUALIFIED	- 0
11.0	EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED [EQUIPMENT ITEM NO(S).: 77,129,130,131,132,144]	- 6
A.III	EQUIPMENT EXEMPT FROM QUALIFICATION	- 3
111.8	EQUIPMENT NOT IN THE SCOPE OF THE REVIEW[EQUIPMENT ITEM NO(S).: 49, 85,163]	- 3
IA	DOCUMENTATION NOT MADE AVAILABLE	- 5
2324222	TOTAL	183

TABLE 4-2 QUALIFICATION DEFICIENCY SUMMARY

 ====	NRC REQUIREMENT	NUMBER OF DEFICIENT EQUIPMENT ITEMS
1.	DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	. 89
2.	ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED————————————————————————————————————	
3.	AGING DEGRADATION EVALUATED ADEQUATELY	
4.	QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)	35
5.	PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION [EQUIPMENT ITEM NO(S).: 164,165,167,168,169]	5
6.	CRITERIA REGARDING AGING SIMULATION (IF REQUIRED)	2
7.	CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:	
	A PEAK TEMPERATURE ADEQUATE	10

Table 4-2 (Cont.) QUALIFICATION DEFICIENCY SUMMARY

NUMBER OF DEFICIENT EQUIPMENT NRC REQUIREMENT ITEMS B. - PEAK PRESSURE ADEQUATE-----9 [EQUIPMENT ITEM NO(S) .: 6, 10, 11, 13, 16, 17,135,164,179] 5 C. - DURATION ADEQUATE----[EQUIPMENT ITEM NO(S) .: 135,137,146,164, 179.179 1 D. - REQUIRED PROFILE ENVELOPED ADEQUATELY----[EQUIPMENT ITEM NO(S) .: 161,164] E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE----[EQUIPMENT ITEM NO(S) .: 135,164,179] 8. CRITERIA REGARDING SPRAY SATISFIED -----2 [EQUIPMENT ITEM NO(S) .: 93,161] 9 CRITERIA REGARDING SUBMERGENCE SATISFIED -----[EQUIPMENT ITEM NO(S) .: 139] 10. CRITERIA REGARDING RADIATION SATISFIED -------7 [EQUIPMENT ITEM NO(S).: 8, 93,164,165,167,168, 169,169] 11. CRITERIA REGARDING TEST SCOUENCE SATISFIED ------4 [EQUIPMENT ITEM NO(S).: 135,104,165,179] 12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED-----0 13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED -----[EQUIPMENT ITEM NO(S) .: 161] 14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED -----6 [EQUIPMENT ITEM NO(S) .: 161,164,165,167,168,169] 15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED ---1 [EQUIPMENT ITEM NO(S) .: 164]

Table 4-2 (Cont.) QUALIFICATION DEFICIENCY SUMMARY

NUMBER OF DEFICIENT EQUIPMENT ITEMS

16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)- 0

TABLE 4-3

LICENSEE CORRECTIVE ACTION SUMMARY

	CORRECTIVE ACTION DESCRIPTION	NUMBER OF EQUIPMENT ITEMS
EQUIPMEN 34, 35, 58, 60, 106,107, 118,119,	ENT WITH QUALIFIED EQUIPMENT T ITEM NO(S).: 26, 29, 30, 31, 32 36, 37, 41, 42, 43, 44, 50, 52, 53 61, 62, 63, 64, 72,101,102,103,104 108,109,110,111,112,113,114,115,116 120,141,143,145,149,150,152,156,157 181,182 J	, 33, , 54, ,105, ,117,
2. EQUIPMENT MODIFICA	TION	0
3. EQUIPMENT RELOCATI	ON ABOVE SUBMERGENCE LEVEL	0
4. RELOCATE OR SHIELD	EQUIPMENT FROM RADIATION SOURCE	0
[EQUIPMEN 39, 40,	ON BY ADDITIONAL TESTING/ANALYSIS T ITEM NO(S).: 5, 6, 8, 10, 11 46, 47, 48, 51, 56, 57, 59, 66, 67 74, 75,148,153,154,155,158,166,172	, 38,
6. EQUIPMENT RELOCATI	ON TO A MILD ENVIRONMENT	0
	ING OF EQUIPMENT IN PROGRESS T ITEM NO(S).: 70,170,171)	3
[EQUIPMEN	D DESCRIPTION SEE SPECIFIC EQUIPMEN T ITEM NO(S).: 10, 18, 19, 20, 21 25, 49, 98,121,122,123,151]	
PROVIDED (SEE SPECIFI [EQUIPMEN	ON OF CORRECTIVE ACTION(S) HAS BEEN C EQUIPMENT ITEM FOR COMPLETION DAT TITEM NO(S).: 39, 40, 41, 42, 43 70, 72,150,159,170,171]	E) 14

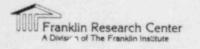


Table 4-4

I NAC PEQUIREMENTS (DESIGNATION: X = DEFICIENCY) I 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1														
NRC REQUIREMENTS	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1	I X	1 1	1	1	1	9101	0101	1110	1121	013	1014	101
NAC REQUIREMENTS (DESIGNATION: X = DEFICIENCY) 1	1 X 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		X	!	1	1	1	1	1		-	ERE		
1 15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED				1	1	1	1	1 X X 1 X 1 X 1 X 1 X 1 X 1 X 1 X 1 X 1			X 1 X 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	xxx	1	1
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I NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY) 1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE————————————————————————————————————	xxx	1 X X X X X	1 X 1 X 1 X 1 X 1 X 1 X 1 X 1 X 1 X 1 X	! ! ! ! X	1 1 2 X	1021 X	10221 11	10233 11 X 11 X 11 X 11 X	X X X	x x x	x	10271	X	1 X	0301 ===== 1 X 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 16. CRITERIA REGARDING MARGINS GATISFYED (NUREG-0588, CAT. 1)	x	1 X	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1 X X 1 X 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	X	x	X	X	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	X	X	X 1
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED) 1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT 2. EQUIPMENT MUDIFICATION 3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL 4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SQURCE 5. VERIFY QUALIFICATION OF ADDITIONAL TESTING/ANALYSIS 6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT 7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS 1. OTHER (SEE SPECIFIC EQUIPMENT ITEM IF CHECKED) 1. SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED——			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 X	1 X	X			X	1 X 1 X 1 X 1 X 1 X 1 X 1 X 1 X 1 X 1 X

Table 4-4 (Cont.)

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NRC REQUIREMENTS (DESIGNATION: X'= DEFICIENCY)	1	1	1	1	1	1	1	1	1		1				
(nodiusate succession and a succession	1	1	1	1	i	i	i	i	i		i		:	:	:
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TEST SPECINEN ESTABLISHED	1	1	1	1	1	1	1	1	1	1	1	1	1	\$	1 X
3. AGING DEGRADATION EVALUATED ADEQUATELY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ESTABLISHED (PE REQUIRED)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5. PROGRAM SETABLISHED TO IDENTIFY AGING DEGRADATION	1		1	1	1	1	1	1	1	1	1	1	1	1	1
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)		1	1	1	1	1	1	1	1	1	1	1	1	1	1
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:				1	1	1	1	1	\$	1	1	1	1	1	1
A PEAK TEMPERATURE ADEQUATE				1	1	1	1	1	2	1	1	1	1	1	1
B PEAK PRESSURE ADEQUATE		1		1	1	ž.	1	1	1	1	1	1	1	1	1
C DURATION ADEQUATE			3				1	1	1	1	1	1	1	1	1
D REQUIRED PROFILE ENVELOPED ADEQUATELY			8	1		1	1	ı	1	1	1	1	1	1	1
E STEAM EXPOSURE (IF REQUIRED) ADEQUATE					3	1	1		1	1	1	1	1	1	1
8. CRITERIA REGARDING SPRAY SATISFIED			:			1			1	1	1	1	1	1	1
9. CRITERIA REGARDING SUBMERGENCE SATISFIED		:	•				1		1	1	1	1	1	1	1
IO. CRITERIA REGARDING RADIATION SATISFIED			:		:			5	1		1	1	1	1	1
II. CRITERIA REGARDING TEST SEQUENCE SATISFIED			:	:	:		:		:	1			1		1
2. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES			:	:								1	1	1	1
(IF ANY) SATISFIED			:	:							1	1	1	1	1
13. CHITERIA REGARDING FUNCTIONAL TESTING SATISFIED				:										1	1
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIFD			:		:		:						1	1	1
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIES					;										
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)				i	1						:			:	:
						CHRE									
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)		1 1	1	1	1	1	1	1		1					
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11.4 EGUIPMENT QUALIFICATION NOT ESTABLISHED		1	1	1			1 1					-		. ^	i x
				1	1	1	1 1								. ^
ANTICOLOGICAL PROPERTY OF ACTOR AND	- 1	1		1	1 1		1 1	1		1					
QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED	- 1			1	1 1	1	1 1			1					i
TO DESCRIPTION OF THE PROPERTY	- 1	1		1	1 1	1	1 1			1	1			1	
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IV DOCUMENTATION NOT MADE AVAILABLE				1 1		1	1 1								
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TO THE PARTY OF TH	- 1	- 1		1 1	1 1	1 1	1 1	1	1 1	1 1	1 1	1 1	1 1	1 1	1
1. EUUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT	- 1	- 1	4		1 1	1	1 1	1	1 1	1 1					1
2. FOUIPMENT MODIFICATION	X 1	X 1	X	X	X	X 1	XI	- 1	1 1		E I	X I	X	1 X 1	1
3. FOULPHENT RELOCATION ABOVE THE SUBMERGENCE LEVEL	. 1	- 1			1	1	1 1	1		1 1	1	1			1
4. PELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE	1				1		1 1	- 1		1 1	1		1		1
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS	. 1	1		1	1			1	1		1	1	1	1	1
6. EGGAPHENT RELOCATION TO A MILD ENVIRONMENT		1		1	1		1	X 1	X	X I	1	1	1	1 1	1
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS	1	1			- 1	1	1		- 1	1	1	1			1
6. OTHER (SEE SPECIFIC EQUIPMENT ITEM IF CHECKED)		1				- 1		- 1	- 1	1 1	1		1	1 1	1
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SCHEDULF FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED		1		1	1	1	1	- 1	. 1	1		- 1	- 1	1	

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NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	1	1	1	1	1	1	1	1	1	1	1				
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2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND	1	1	1	1	1	1	1	1	1	1	1	1	i	1	i
TEST SPECIMEN ESTABLISHED	!	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3. AGING DEGRADATION EVALUATED ADEQUATELY	!	\$	1	1	1	1	1	1	1	1	1	1	1	1	1
ESTABLISHED (IF REQUIRED)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION							1	1	1	1	1	1	1	1	1
6. CRITERIA REGARDING AGING SINULATION SATISFIED (IF REQUIRED)					1			1		1	ı	1	1	1	1
7. CHITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:	:	:	:		:	:	:				1	1	I .	1	1
A PEAK TEMPERATURE ADEQUATE		:	:	:	:	:	:								:
B PEAK PRESSURE ADEQUATE		;	:	:	: .	:	:	:		:					
C DUPATION ADEQUATE		i	i	i	i										
D PEGUIRED PROFILE ENVELOPED ADEQUATELY		1	i	i	i	i	i								:
E STEAM EXPOSURE (IF REQUIRED) ADEQUATE		1	1	i	i	i	i	i		i		i			ï
8. CRITERIA REGARDING SPRAY SATISFIED	1	1	1	1	1	1	1	1	1	1	i	i			i
9. CRITERIA REGARDING SUBMERGENCE SATISFIED	!	1	1	1	1	1	1	1	1	1		1			i
O. CRITERIA REGARDING RADIATION SATISFIED		1	1	1	1	1	1	1	1	1	1	1	1	1	i
4. CRITERIA REGARDING TEST SEQUENCE SATISFIED	1	1	1	1	1	1	1	1	1	1	1	1	1		i
2. CHITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED			1	1	1	1	1	1 .	1	1	1	1	1	1	1
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED	!	1			1	1		1	1	1	1	1	1	1	1
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED	:	:	:	:						1					1
16. CHITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)	!	:	:	:	:										1
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NRC QUALIFICATION CATEGORY [DESTGRATION: X = CATEGORY)	1	1	1	1	1	1	1	1		1	1	1	1	1	1
1.A EQUIPMENT QUALIFIED	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	!	1	1	1	1	1	1	1	1	1	1	1	1	1	1
I.6 EQUIPMENT QUALIFICATION PENDING MODIFICATION	1 X	IX	1 X	1	1 X	1 X	IX	1 X	X	1	1 X	1 X	1 X	X	1
II.A FOUIPMENT NOT QUALIFIED		1	1	1		1	1	1	1	1 X		1	1	1	1
II.C FOUIPHENT SATISFIES ALL REQUIREMENTS EXCEPT	1	:		1	1		1			1	1	1			1
QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIES	!	:	1	:	1					1					1
III.A EQUIPMENT EXEMPT FROM QUALIFICATION		:		:	:										:
ITI.B FOUIPHENT NOT IN THE SCOPE OF THE REVIEW	!		:	i ×	:										:
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3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL	:		1	1	1	1		1 1		1	1 1	1	1 1		:
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE			1	1			1	1		1	1				1
. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS	! v			:						1					1
6. FULLPMENT RELOCATION TO A MILD ENVIRONMENT	! ^		1 A			I A					X	X		X	
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS	1			:											1
8. OTHER (SEE SPECIFIC EQUIPMENT ITEM IF CHECKED)	!		1	ix	ì										
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NRC REQUIREMENTS	(DESIGNATION: X = DEFICIENCY)	1	1	!	1	1	1	1	1	1	4	1	1	1	1	1
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10. CRITERIA REGART 11. CRITERIA REGART 12. CRITERIA REGART 13. CRITERIA REGART 14. CRITERIA REGART 15. TEST DURATION 16. CRITERIA REGART	ING RADIATION SATISFIED		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1								
I.b EQUIPMENT OF THE PROPERTY		- i x	1 x 1 x 1 x 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 x	1 X 1 X 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1	1 X 1 I X 1 I I I I I I I I I I I I I I	1 x 1 x 1 1 x 1 1 1 1 1 1 1 1 1 1 1 1 1	1 X	X	1 X	X	X	X	x	
CORRECTIVE ACTION S 1. FOUIPMENT REPLA 2. EQUIPMENT MODIF 3. EQUIPMENT RELOCA 4. PELOCATE OR SHI 5. VERZTY QUALIFIC 6. FOUIPMENT PELOC 7. QUALIFICATION 7 8. OTHER (SEE S	PECIFIED (DESIGNATION: X = ACTION SPECIFIED)	1 X 1 X 1 1 1 1 1	1 X 1 1 X 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1	1 X 1 X 1 1 X 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	X		! ! ! ! ! ! ! ! ! ! ! X ! ! ! X ! ! ! X	X	x	X	x	

FOUIPMENT ENVIROPHENTAL GUALIFICATION SUMMARY FORM

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1 16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)	X 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	X 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	x	x	**************************************	######################################	x	I X			X		x	1	

	1				FR	EQS :	IPHE	NT I	TEM	NUMB	ERS				
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1 NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	1	1	1	1	1	1	1	1	!	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	i	1	1	i
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	1	1 X	1 X	1	1	1	1 X	1 X	1 X	1 X	1 X	t X	1 X	I X	1 X
1 2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND	1	!		1	1	1	1	1	1	1	1	1	1	1	1
TEST SPECIMEN ESTABLISHED	1 X	1 X	The real of	1 X	1	1	1	1	1	1	1	1	1	1	1
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE	1		1 X	1	1	1	1	1	1	1	1	1	1	1	1
FSTARLISHED (IF REQUIRED)	1		! .	1	1	1	1		1	1	1	1	1	1	1
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION			1 X		1					1	!	!	1	!	
6. CHITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)		:			:	:	:								
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:	1	:	:		1	:			,						
A PEAK TEMPERATURE ADEQUATE			1			:	:			:	:				
B PEAK PRESSURE ADEQUATE	1	i	i	i.	i	i	i			:			:		
C DURATION ADEQUATE	1	1	1	i	i	1	i				1		2		•
D REGUTRED PROFILE ENVELOPED ADEQUATELY		1	1	1	i	1	1	1	i	1	i		4		1
E STEAM EXPOSURE (IF REQUIRED) ADEQUATE		1	1	1	1	1	1	1	1	1	1	i			1
8. CRITERIA REGARDING SPRAY SATISFIED			1 X	1	1	1	1		1	1	1	1	8	1	i
9. CRITERIA REGARDING SUBMERGENCE SATISFIED	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10. CRITERIA REGARDING RADIATION SATISFIED	1	1	1 X	1	1	1	1	1	1	1	1	1	1 1	1	1
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED	1	1	1	1	1	1	1	1	1	1	1	1	1 1		1
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES		1	1	1	1-	1	1	1	1	1	1	1			1
(IF ANY) SATISFIED			1	1	1	1	1	1	1	1	t	1	1 1		1
.14. CHITERIA REGARDING INSTRUMENT ACCURACY SATISFIED		1					1		1	1		1			1
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED				1	:	:									
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)					:	:	:								
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MRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)	1	1	1	1	1	1	1			1	l				
	1	1	1	1	1	1	1			,					
I.A FQUIPHENT QUALIFIED		1	1	1	ŝ	1	1	21.21					1 1		
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION		1	1	1	1	1	1 1	X		1	X	X	X	X I	X
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II.8 EQUIPMENT NOT QUALIFIED	1 1	1	1	1	1	1	1 .			1	1	1	1 1	1	1
The state of the s	1 1		1	1	1	1	1 1	1		1			1 1	1	1
QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED			1	1	1	1	1						1 1	1	1
III.A FOUIPMENT EXEMPT FROM QUALIFICATION					1 X	ix	1 1			1	1		1 1		
IV DOCUMENTATION NOT MADE AVAILABLE				:	1		1	5 - B							
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)	1 3			1	1	1	1			1			1		
***************************************	1	1		1	1	1	1								
1. FOUIPHENT REPLACEMENT WITH QUALIFIED EQUIPMENT		1 1	1	1	1	1	1 1	1		1	X	x	X	X	×
2. EQUIPMENT MODIFICATION	1 !	! !	1	1	1	1	1 1			1	1	1	1	1	
3. EQUIPMENT RELOCATION AROVE THE SUBMERGENCE LEVEL	1 1	1	1	1	1	1	1 1			1	1	1	1	i	1
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE		1	1 1	!	1	1	1 1	1	-	1 1	1 1	1	1	1	
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS				1	1	1	1 1	1		1	1	1			
6. EGUIPMENT RELOCATION TO A MILD ENVIRONMENT				1	1	1	1 1	- 1	1			- 1	1	- 1	
8. OTHER (SEE SPECIFIC EQUIPMENT ITEM IF CHECKED)	1			1				. 1			1	1	1		
Canada Minerial Properties Inch It CHECKED Janes				1				X			1		. 1		
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED								1						- 1	
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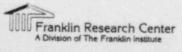
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4.3 METHODOLOGY USED BY THE LICENSEE

This section includes observations concerning the Licensee's qualification methodology presented in the response [10] to the NRC SER.

4.3.1 Completeness of Safety-Related Equipment List

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

"Display instrumentation which provides information for the reactor operators to aid them in the safe handling of the plant was not apscifically 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 postaccident 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.

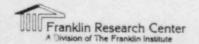
The licensee identified 1173 items of equipment which were assessed by the staff. Because Units 1 and 2 are nearly identical, the review can be performed as one. Where necessary, differences in the units will be noted for clarity."

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

"Display Instrumentation Lists, according to the guidelines of this section of the SER, are given in Tables A and B. Table A lists the plant parameters and associated instrument numbers required for accident monitoring as delineated by the plant technical specifications. Table B lists any additional display instruments specifically mentioned in the LOCA and HELB emergency operating procedures. Also included is the number of the Equipment Qualification Sheet (EQS) associated with each device.

In regard to the SER in this section concerning the omission of the safeguards actuation system, the pressurizer spray system, and the accumulators in the EEEQR, these systems were not omitted, but are covered by the existing EEEQR Safety System List (Table 2.1-1) which has been revised as given in attachment 3."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern. See Appendix C of this TER for further details.



4.3.2 Containment Spray System

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

"The staff has reviewed the qualification documentation to ensure that the qualification specifications envelope the conditions established by the licensee. In addition, the staff assumed, and requires the licensee to verify, that the containment spray system is not subjected to a disabling single-component failure.

Equipment submergence has also been addressed where the possibility exists that flooding of equipment may result from HELBs."

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

"A discussion of the effect(s) of a single failure of a component on the containment spray system operability is given in the revised Section 3.1.2 of the EEEQR contained in attachment 3."

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

4.3.3 Environmental Service Conditions

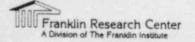
4.3.3.1 Temperature, Pressure, and Humidity Conditions Inside Containment Section 3.3 of the NRC SER [10] identified the following concern:

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

		Max. Temp (°F)	Max. Press. (psig)
LOCA	Lower Compartment	244	12.0
	Upper Compartment	170	12.0
MSLB	Lower Compartment	327	10.8
	Upper Compartment	140	10.8

The licensee's minimum temperature profile for qualification purposes in the lower compartment is based on an MSLB analysis and is acceptable for use because there is reasonable assurance under both MSLB and LOCA conditions that the actual temperatures and pressures for the postulated accidents will not exceed the environmental zone. However, the licensee's MSLB temperature/pressure profile does not extend beyond 1000 seconds. The staff requires that the licensee extend the profile to at least 105 seconds.

The licensee's minimum temperature profile for qualification purposes in the upper compartment is based on the LOCA temperature and is acceptable to the staff."



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

"A revised Section 3.0 and/or Table 3.11-2 of the EEEQR extending the MSLB temperature/pressure profiles for the lower compartment to at least 105 seconds will be submitted with the next revision of the EEEQR."

The Licensee has resolved the NRC concern. The Licensee is responsible for identifying the environments and the parameters identified by the Licensee have been used in the evaluations contained in this Technical Evaluation Report. These parameters are reproduced in Appendix A.

4.3.3.2 Temperature, Pressure, and Humidity Conditions Outside Containment Section 3.4 of the NRC SER [11] stated the following:

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

- (1) Auxiliary Building
- (2) Main steam valve vaults

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

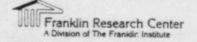
4.3.3.3 Nuclear Radiation Dose (Inside and Outside Containment)

Section 3.8 of the NRC SER [10] stated the following:

"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 to 1×10^8 rads. This value envelopes the minimum requirements of NUREG-0588 and is therefore acceptable.

The required value outside containment of 1 x 10⁶ has been used by the licensee to specify limiting radiation levels for areas near RHR pumps within the auxiliary building. This value appears to consider the radiation levels influenced by the source term methodology associated with post-LOCA recirculation fluid lines."



4.3.4 Chemical Spray

Section 3.6 of the NRC SER [10] identified the following concern:

"The licensee's FSAR value for the chemical concentration is 2000 ppm boric acid solution; the exact volume percent used by the vendor for qualification testing should be verified by the licensee. Therefore, for the purpose of this review, the effects of chemical spray will be considered unresolved. The staff will review the licensee's response when it is submitted and discuss the resolution in a supplemental report."

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

"The effects of 2000 ppm boric acid (chemical spray) upon equipment qualification for that equipment located inside primary containment is addressed on the attachments to the EQS and/or in the column titled 'Environment to which qualified' on Table 3.11-4 in the EEEQR. For that equipment to be tested or replaced, this will be addressed in the same manner after testing or replacement."

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

4.3.5 Submergence

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

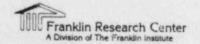
"The maximum submergence levels have been established and assessed by the licensee. Unless otherwise noted, the staff assumed for this review that the methodology employed by the licensee is in accordance with the appropriate criteria as established by Commission Memorandum and Order CLI-80-21.

The licensee's value for maximum submergence is 13.2 ft. In this regard, the Sequoyah design is such that no safety-related equipment is subjected to submergence."

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

"A new level of submergence has been calculated and is discussed in the revised Section 3.1.4 and Table 3.11-2 notes of the EEEQR contained in attachment 3. TVA is presently investigating those components that may be subjected to submergence and will report on the results of this investigation at a later date."

It is concluded that the new information provided by the Licensee will require evaluation when the investigation is completed.



4.3.6 Aging and Qualified Life

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

"NUREG-0588, Category II, delineates two aging program requirements. Valve operators committed to IEEE Standard 382-1972 and motors committed to IEEE Standard 334-1971 must meet the Category I requirements of the NUREG. This requires the establishment of a qualified life, with maintenance/replacement schedules based on the findings. All other equipment must be subjected to an aging program which identifies aging susceptible materials within the component. Additionally, the staff requires that the licensee:

- (1) establish an ongoing program to review surveillance and maintenance records to identify potential age-related degradetions
- (2) 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 [11]:

"A discussion of the requirement that NUREG-0588, Category II valve operators and motors committed to IEEE Standard 382-1972 and 334-1971 respectively must meet the Category I requirements of NUREG 0588 regarding aging is given in Table C (NSSS) and Table D (Balance of Plant).

(NSSS)

Component

A. MTRA-74-10A MTRA-74-20B RHR Pump Motors MTRA-63-10A MTRA-63-15A SIS Pump Motors MTRA-62-108A MTRA-62-104B Centrifugal Charging Pump Motors

Response

These motors have been qualified for aging per Category I of NUREG-0588, according to the general Westinghouse response to NUREG-0588 and and test report WCAP-8754. No material evaluation was performed since the complete component was qualified per the test reports.

MTRB-62-108-A-A MTRB-62-104-A-B Centrifugal Charging Pump Auxiliary Oil Pump Motor MTRB-78-12A MTRB-78-9B MTRB-78-35T Spent Fuel Pit Pump Motor MTRB-62-230A MTRB-62-232B Boric Acid Transfer Pump Motors

These motors have not been qualified for aging per Category I. These metors have been committed to Category I aging requirements. No information is currently available to establish compliance, but it is being sought. If this effort is not successful, these components will be replaced by motors fully qualified to aging requirements.

C. Limitorque Motor
Operators
(various TVA
tag numbers).
SMB-type

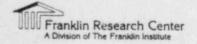
These components have been qualified for aging according to several Limitorque reports. These are listed on EQS - NEB-XX-28, NEB-74-2, NEB-68-4, NEB-62-17, and NEB-63-16. No materials evaluations were performed since the complete components were qualified per above. It remains to match individual operators to the applicable test report. This requires additional information from Limitorque. If components are found not in compliance with aging requirements, the components will be replaced with fully qualified operators or retrofitted accordingly.

TABLE D (Balance of Plant)

	Component	Model No.	EQS No.	Response
1.	Allis-Chalmers	Type 30RS6	MEB-3-003R3	TVA has performed a
2.	Lincoln Electric	S/N 1640467 S/N 1640468	MEB-31-001R2	material analysis on all these components. From the material
3.	General Electric	Type 5K256AN205	MEB-32-002R3	analyses, a qualified life was determined, which will be factored in TVA's
4.	Allis-Chalmers	012 Type FOD	MEB-70-024R2	Surveillance, Maintenance, and
5.	Allis-Chalmers	113 Type RG	MEB-70-030R1	Replacement Program. See reply to SER
6.	Westinghouse	HSNI	MEB-72-025R1	Section 3.7(1), (2), and (3).
7.	Link-Belt	TN 200 & TW 2000	MEB-67-005R3	TVA is presently performing a material analysis on this component. This analysis will be factored into the test report discussed on the attachments of the EQS. The results of this analysis will be included in the next revision of the EEEQR.
8.	Limitorque Motor Operators (SMB-Type)		MEB-1-006 MEB-3-007 MEB-3-009 MEB-3-011 MEB-26-008 MEB-67-014 MEB-67-016 MEB-67-026 MEB-70-012 MEB-70-015	These components have been qualified for aging according to several Limitorque Reports. No material evaluations were performed since the complete components were qualified per above.

3.7 (0) - Material Analyses -

Aging as related to material evaluations was handled on a case-by-case basis in the appendixes to the EQS's. Some components were aged thermally before their accident testing, in which case, material evaluations were



not needed. In other cases, only the most susceptible material in the component was identified, and this was used to evaluate qualified life. If materials were not available and some testing had been performed, the 10°C rule or some other acceptable means was used to establish qualified life.

3.7 (1) - Surveillance and Maintenance Program -

TVA has an established maintenance program that operates in accordance with our Nuclear-Operational Quality Assurance Manual (N-OQAM) (designed to meet the requirements of Appendix B of 10 CFR 50) and ANSI N18-1976. As a part of the maintenance program, maintenance instructions (MI's) and surveillance instructions (3I's) are performed on all safety-related equipment to determine operability and to detect any signs of deviations, deterioration and/or degradation in the equipment being tested. If the MI's or SI's are not run successfully, the documentation is detailed so that the cause of the malfunction would be documented as well as a description of the repairs. The documentation also has a place for collecting data if any parts are replaced during the repairs. The documentation for safety-related systems is kept on file at the plant, and the present review of the documentation at the plant is sufficient to detect age-related degradation.

3.7 (2) - Maintenance and Replacement Schedules -

TVA is in the process of developing a computer program to address class lE safety-related electrical equipment located in a harsh environment at Sequoyah. The computer program will contain all pertinent equipment nameplate data and environmental parameters, plus the established qualified life of the equipment. TVA has a contract with Wyle Laboratories that will establish the qualified life of many components. The qualified life as determined by Wyle Laboratories will be age related, since the equipment will be subjected to aging during testing. Our maintenance and surveillance programs reviews will detect age degradation in installed components. The information from all sources will be entered into the computer program as it becomes available. The computer program will be run periodically to ensure that items will be changed out before the end of their qualified life. The program will be run with sufficient leadtime to allow for the procurement, if necessary, of needed items that are qualified environmentally."

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.

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ITEM				
NO.	COMPONENT	MATHEACTURER	MUDEL HARBER	LOCATION
	************************			********************************
1	MOTORIZED VALVE ACTUATOR	FINK-BELT	TN200/TN2000	AUXILIARY HUILDING
2	MOTORIZED VALVE ACTUATOR	LINK-BELT	. TN200/TN2000	AUXILIARY RUILDING
3	MOTORIZED VALVE ACTUATUR	CHICAGO FLUID POWER	TVA-01-0577	WEST VALVE POOMS
4	MOTORIZED VALVE ACTUATOR	CHICAGO FLUID POWER	TVA-01-0577	EAST VALVE ROOM
5	ELECTROHYDRAULIC VALVE ACTUATOR	HFA	MEA119K2	AUXILIARY BUILDING
6	MOTORIZED VALVE ACTUATUR	LIMITORQUE	. SMB; SIZES 00, 000	AUXILIARY BUILDING
7	HOTORIZED VALVE ACTUATOR	LIMITOROUE	S48; SIZE 000	AUXILIARY BUILDING, PIPE CHASE
8	HOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB; SI7FS 1, 2	AGXILIARY BUILDING
9	MOTORIZED VALVE ACTUATOR	LIMITOROUE	SYB; SIZES 00, 000	ACXILIARY AUTIDING (CORRIDON 690, A
10	MOTORIZED VALVE ACTUATOR	LIHITOROUE	SHB: SIZE OO	WEST VALVE ROOM
11	MOTORIZED VALVE ACTUATOR	LINITORQUE	SMILL SIZE 4	EAST VALVE ROOM
12	MOTORIZED VALVE ACTUATUR	LIMITORQUE	SME; SIZE OO	AUXILIARY BUILDING, INDIVIDUALITY CO
13	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB; SIZE 00	CUNTAINHENT
14	MOTORITED VALVE ACTUATOR	LIMITOROUE	SMB; SIZE 000	AUXILIARY BUILDING, OPEN AREA, ELEV
15	HOTCHEZED VALVE ACTUATOR	LIMITOROUE	S#8; S1ZF 000	ANNULUS
16	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SNR; SIZE 4	WEST VALVE ROOM
17	MOTORIZED VALVE ACTUATOR	LIMITOROUE	SMB) SIZE 000	CONTAINMENT
18	MOTORIZED VALVE ACTUATOR	LIMITOROUE	SNB; SIZES 00, 0, 1, 2, 3	AUXILIARY RUILDING, INDIVIDUALLY CO
19	MOTORIZED VALVE ACTUATOR	LINITOROUE	SMB; SIZES 00, 1, 2	AUFILIARY BUILDING
20	MOTORIZED VALVE ACTUATOR	LIMITOROUE	SMB1 SIZE 00	AUXILIARY BUILDING
21	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB1 RIZE OO	AUXILIARY BUILDING, GENERAL SPACES
22	MOTORIZED VALVE ACTUATOR	LIMITOROUE	SMB1 SIZF 00	AUXILIARY BUILDING, INDIVIDUALITY CO
23	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SHB; SIZES 00, 2, 3	CUNTAINMENT
24	MOTORIZED VALVE ACTUATOR	FIMILUBURE	SMB; SIZE 1	CONTAINMENT
25	MOTORIZED VALVE ACTUATOR	LIMITOHOUE	54H; SIZE 00	CONTAINMENT
26	ELECTRIC MOTOR	RELIANCE ELECTRIC	3Y362708	NOT STATED
27	ELECTRIC MUTUR	RELIANCE ELECTRIC	X328203	CONTAINMENT, LOWER COMPANIMENT
28	ELECTRIC MUTUR	LINCOLN	12557	HOT STATED
29	ELECTRIC MUTUR	LINCOLN	T2523	AUXILIARY AUILDING
30	ELECTRIC MOTUR	LINCULA	T2518	AUXILIARY BUTLDING
31	ELECTRIC MOTOR	LINCOLN	17518	AUXILIARY BUILDING
32	ELECTRIC MUTOR	LINCOLN	T2518	AUXILIARY SUILDING
33	ELECTRIC MOTOR	LINCULN	T2556	AUXILIARY AUILDING
34	ELECTRIC MOTOR	RELIANCE PLECTRIC	3Y36220A	AUXILIARY AUTLDING
35	ELECTRIC MUTUR	WESTINGHOUSE	76055052	AUXILIARY SUILDING
36	ELECTRIC MOTOR	LTHCOLN	72518	AUXILIARY BUILDING
37	ELECTRIC MUTUR	Lincotn	T2523	AUXILIARY SUILDING
38	ELECTRIC MOTOR	WESTINGHOUSE	1000	AUXILIARY RUILDING
39	ELECTRIC MOTOP	WESTINGHOUSE	5809P24	AUXILIARY BUILDING
40	ELECTRIC MUTUR	WESTINGHOUSE	TRUP	AUXILIARY BUILDING
41	ELECTRIC MOTOR	ALLIS CHALHERS	30156	AUXILIARY REILDING
42	ELECTRIC MUTUR	LTHCOT-H	FOT STATED	AUXILIARY BUILDING
43	ELECTRIC MOTOP	GENERAL ELECTRIC	5K256A,1205	AUXIETARY BUILDING
44	ELECTRIC MOTUP	SIEMANS-ALLIS	NOT STATED	AUXILIARY PUILDING
45	ELECTRIC MOTOR	WESTIRGHOUSE		· AUXILIARY BUILDING
46	ELECTRIC MOTOR	FSTINGHOUSE .	052H4 SBI-P "KR	AUXILIARY BUILDING
47	CONTROL SWITCH	CUTLER HAMMER	102507	AUXILIARY BUILDING
48	CONTROL SWITCH	CUTLER HAPPER	10250T	CONTAINTENT
49	CONTROL SWITCH	ELECTRO SHITCH	SPRIES 21	AUXIERARY BRITEDING

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NO.	CORPONENT	HAMIFACTURER	RODEL BURNER	LOCATION
50	D/P SWITCH	BARTON	286	AUXICIARY PULLDING
51	PRESSURF SWITCH	DEALE	3301	AUXILIARY BUILDING
52	PRESSURE SWITCH	BARTON	298	MEST VALVE VAILT
53	FLOW SWITCH	EARTUN	298	AUXILIARY AUILDING
54	PRESSURE SWITCH	CUSTOM COMPONENT	604G	AUXILIARY BUILDING
55	PRESSURF SWITCH	DWYER	1627	
56	FLOW SWITCH	DWYFR	1627	AUXILIARY BUILDING
57	FLOW SWITCH	DWYFR	1627	AUXILIARY BUYLDING
56	PRESSURE SWITCH	BARTON	2884	AMMILUS
59	PRESSURF SWITCH	DWYER	1627	
60	PRESSURE SWITCH	CUSTOM COMPONENT	604G	AUXILIARY BUILDING
61	D/P TRANSMITTER	BAILEY METER	555	AUXILIARY BUILDING
62	D/P TRANSMITTER	FOXBURO	E13DL	AUXICIARY RUILDING
63	D/P TRANSMITTER	PAILEY METER	555	AUXILIARY BUILDING
64	FLOW TRANSHITTER	BAILEY METER		AUXILIARY HUTLDING
65	D/P TRANSMITTER	BARTON	555	AUXILIARY BUILDING
66	PRESSURE CONTROLLER		764 LOT 2	LOWER CONTAINMENT
67	SIGNAL CUNVERTER	TRANSMATION	PC40002	AUXILIARY BUILDING
68	AIR DRYFR	PALL TRINITY MICRO	SW1731T	AUXILIARY BUILDING
69	PANEL, DISTRIBUTION	POWER ELECTRIC	101HA1 6HD9R10 331	AUXILIARY BUILDING
70	PANEL. I AND C	TERPY	CC8	NOT STATED
71	PANEL, I AND C		GS2	AUXILIARY RUILDING
72	ELECTRIC HEATER	INGERSOLL-RAND	7Y4FSV IP Nt. 7	AUXILIARY BUILDING
73	TRANSDUCER	E. U. HRIGAN	04265379001	CONTAINMENT
74	TRANSDUCER	ITT HAMMER	725	AUXILIARY BUILDING
75	TRANSDUCER, 1/P		8005	AUXILIARY BUILDING
76	PANEL, RELAY	ROBERTSHAW	445C3	AUXILIARY BUILDING
77	ELECTRICAL CARLE SPLICE	INTERNATIONAL SWITCHBOARD		AUXILIARY BUILDING
78	ELECTRICAL CARLE	RAYCHEM	NCSF N	INSIDE AND OUTSIDE CONTAINMENT
79	ELECTRICAL CAPLE	AMERICAN INSULATED WIFE	NOT STATED	INSIDE AND OUTSIDE CONTAINAETT
80	ELECTRICAL CAPLE	ROCKBESTOS	HOT STATED	INSIDE AND OUTSIDE COUTAINFENT
81	ELECTRICAL CARLE	ANACOMDA WIRE AND CABLE	HOT STATED	INSIDE AND DUTSIDE CONTAINMENT
92	ELECTRICAL CARLE	AMACUMDA WIRE AND CABLE	NOT STATED	INSIDE AND OUTSIDE CONTAINERS
0.00		ROCKBESTOS	NOT STATED	INSIDE AND OUTSIDE CONTAINENT
83	ELECTRICAL CARLE	ITT SUPFRNANT	NOT STATED	INSIDE AND UNTSIDE CONTAINVENT
95	ELECTRICAL CARLF	BRAND-REX	NOT STATED	INSIDE AND OUTSIDE CONTAINENT
	ELECTRICAL CAPLE	1TT SUPERNAUT	TRIAXIAL	OUTSIDE CONTAINMENT
86	ELECTRICAL CAPLE	GENERAL ELECTRIC	Aurklue	INSIDE AND UNTSIDE CONTAINMENT
87	ELECTRICAL CARLE	INSTRUMENT CARLE	ENT STATED	INSIDE AND OUTSIDE CONTAINNELT
88	ELECTRICAL CARLE	ND	HOT STATED	INSIDE AND OUTSIDE CONTAINMENT
89	ELECTRICAL CARLE	OKONITE	UNT STATED	INSIDE AND DUTSICE CONTAINSENT
90	ELECTRICAL CARLE	1.0	NOT STATED	INSIDE AND OUTSIDE CONTAINMENT
91	ELECTRICAL CARLE	nn .	MOT STATED	INSIDE AND OUTSIDE CONTAINMENT
92	ELECTRICAL CARLE	IID.	TFFZEL	INSIDE AND OUTSIDE CONTAINMENT
93	ELECTRICAL PENETRATION	EFSTINGHOUSE.	TYPES MX32198 THROUGH 32212	CONTAINMENT
94	ELECTRICAL CAPLE	np.	ENT STATED	INSIDE AND OUTSIDE CONTAINFEAT
95	ELECTRICAL CAPLE	NP.	NOT STATED	ANTOLOS
96	JUNCTION BOX	TVA	ENT STATED	INSIDE AND DUTSIDE CONTAINFENT
97	TERMINAL PLOCK	1.0	VASTORS	INSIDE AND OUTSIDE CONTAINAFFI
98	TRANSFURMER	KESTINGHOUSE	LISPID FILLED	VANITIVEA BUILDING

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NO.	COMPONENT	HARUFACTURER	MOLFL NUMBER	LOCATION

99	SOLENOID VALVE	AUTOMATIC VALVE CORP	C5439	CONTAINMENT
100	SOLENOID VALVE	AUTOMATIC VALVE CORP	C5439	AUXILIARY BUILDING
101	SCLENOID VALVE	ASCO	8320A19	AUXILIARY MUILDING
102	SOLENDID VALVE	ASCO	HT8300	COFTAINMENT
103	SOLENOID VALVE	ASCO	HT8302H25RF	AUXILIARY BUILDING
104	SOLENDID VALVE	ASCO	HT8300	OUTSIDE CONTAINMENT
105	SOLENOID VALVE	ASCO	HV202300LRV	AUXILIARY BUTLDING
106	SOLEHOID VALVE	ASCO	HV2009242F	AUXILIARY BUILDING
107	SOLENOID VALVE	ASCO	HTX9320	ANNULUS
108	SOLENOID VALVE	ASCO	KT8300	AUXILIARY BUILDING
109	SOLENDIP VALVE	ASCO	WPXHV2023011F	AUXILIARY BUILDING
110	SOLENOID VALVE	ASCO	HR8300	AUXILIARY RUILDING
111	SOLENDID VALVE	ASCO	HR8300	AUXILIARY BUILDING
112	SOLENOID VALVE	ASCO	HV2009211RF	AUXILIARY HUILDING
113	SOLFNOID VALVE	ASCO	8300 AND 8302	AUXILIARY PUILPING
114	SOLENOID VALVE	ASCO	831654	AUXILIARY BUILDING
115	SOLENOID VALVE	ASCO	831654	AUXILIARY BUILDING
116	SOLENDID VALVE	ASCO	LB#300B64RU	AUXILIARY BUILDING
117	SOLENOID VALVE	ASCO	HT831654	AUXILIARY BUILDING
110	SOLFNOID VALVE	ASCO	LR831654	CONTAINMENT
119	SOLENOID VALVE	ASCO	LR831654	CONTAINMENT
120	SOLEHOLD VALVE	ASCO	HAB300C5BRU	AUXILIARY BUILDING
121	SOLENDID VALVE	ASCO	HT8300 SERIES WPHXHV2023011	LOWER CONTAINMENT
122	SOLEHOID VALVE	ASCO	9320	AUXILIARY BUILDING
123	SOLENOID VALVE	ASCO	6300	OUTSIDE CONTAINMENT
124	SOLENOID VALVE	ASCO	2063813RF	COMTAINMENT
125	SOLEWOLD VALVE	ASCO	2063813RF	ANNOLUS
126	SOLFNOID VALVE	ASCO	NP831654E	CONTAINMENT
127	SOLENOID VALVE	ASCO	2063813RF	CONTAINMENT
128	SOLENGID VALVE	ASCO	2063813RF	AUXILIARY PUILDING
130	SOLENOID VALVE	ASCO	HV2063902RVII	ANHULUS
131		ASCO	206380 AND 206381	ANNULUS
132	SOLENDID VALVE	ASCO ASCO	206381	OUTSIDE CONTAINMENT
133	SOLEHOID VALVE	ASCO	2063813RF 206381	AUXILIARY AUILDING CONTAINMENT
134	SOLENOID VALVE	TARGET RUCK	775001	CONTAINMENT
135	LIMIT SWITCH	NANCO	EA170	
136	LIMIT SWITCH	LANCO	EA170302	ANNULUS
137	LIMIT SWITCH	HASCO	EA180	AUXILIARY RUILDING CONTAINMENT
138	LIMIT SWITCH	PARCO	EAIRO	AUXILIARY RUELDING
139	LIMIT SWITCH	NAMCO	EALAO	CONTAINMENT
140	LIMIT SWITCH	NICRO SWITCH	UPPAR7905	ANNULUS
141	LIMIT SWITCH	HARCO	EA700	ANNULUS
142	LIMIT SWITCH	HANCE	E 4700	AUXILIARY BUTLDING
143	LIMIT SWITCH	UA/CO	EA700	AUXILIARY BUILDING
144	LIMIT SWITCH	HALCO	EA 170	AUXILIARY BUILDING
145	LIMIT SVITCH	GARCO	E8170	VAPIOUS
146	LIMIT SWITCH	PARCO	EA740	CONTAINMENT
147	LIMIT SWITCH	LATCC	EA7 3	AUXILIARY BUILDING
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! EQUIPMENT ENVIRONMENTAL QUALIFICATION !
! EQUIPMENT ITEM CHECKSHEET INDEX !
! SEQUIPMENT 2 !

148 RADIATION MONTTOR GENERAL ATOMIC NOT S 149 PRESSURE TRANSMITTER BAILEY METER 556	AUXILIARY BUILDING CORFIDOR, ELEV. AUXILIARY BUILDING OPEN AREA, FLEV. C AUXILIARY BUILDING 1540 AUXILIARY BUILDING 50 AUXILIARY BUILDING -7 AUXILIARY BUILDING
148 RADIATION MONTTOR GENERAL ATOMIC NOT S 149 PRESSURE TRANSMITTER BAILEY METER 556 150 LEVEL SWITCH MERCOTD 203G7 151 TEMPERATURE SWITCH PENN A19BA 152 TEMPERATURE SWITCH HONEYWELL T675A	AUXILIARY BUILDING AUXILIARY BUILDING CORPIDOR, ELEV. B10C1160 AUXILIARY BUILDING OPEN AREA, FLEV. C AUXILIARY BUILDING 1540 AUXILIARY BUILDING 50 AUXILIARY BUILDING 77 AUXILIARY BUILDING
149 PRESSURE TRANSMITTER BAILEY METER 556 150 LEVEL SWITCH MERCOTD 203G7 151 TEMPERATURE SWITCH PENN A19BA 152 TEMPERATURE SWITCH HOMEYWELL T675A	AUXILIARY BUILDING CORFIDOR, ELEV. AUXILIARY BUILDING DPEN AREA, FLEV. C AUXILIARY BUILDING 1540 AUXILIARY BUILDING 50 AUXILIARY BUILDING -7 AUXILIARY BUILDING
150 LEVEL SWITCH MERCOTD 203G7 151 TEMPERATURE SWITCH PENN A19BA 152 TEMPERATURE SWITCH HONFYWELL T675A	AUXILIARY BUILDING OPEN AREA, FLEV. C AUXILIARY BUILDING 1540 AUXILIARY BUILDING 50 AUXILIARY BUILDING -7 AUXILIARY BUILDING
151 TEMPERATURE SWITCH PENN A19BA 152 TEMPERATURE SWITCH HONFYWELL T675A	C AUXILIARY BUILDING 1540 AUXILIARY BUILDING 50 AUXILIARY BUILDING -7 AUXILIARY BUILDING
152 TEMPERATURE SWITCH HOUFYWELL T675A	1540 AUXILIARY BUILDING 50 AUXILIARY BUILDING -7 AUXILIARY BUILDING
132 1646641146 341.64	50 AUXILIARY BUILDING -7 AUXILIARY BUILDING
	-7 AUXILIARY BUTLDING
	The state of the s
154 TEMPERATURE SKITCH FEWAL 18003	-O AUXILIARY BUILDING FW PUMP TURPITE
155 TEMPERATURE SWITCH FERWAL 17323	
156 TEMPERATURE SWITCH FERMAL T675A	
157 TEMPERATURE ELEMENT ROSEMOUNT 176KS	
158 HYDROGEN ANALYZER COMSIP DELPHI K111M	
159 PRESSURE TRANSMITTER FOXBORD E11GM	
160 LEVEL TRANSMITTER FOXBORD E13DM	
161 TEMPERATUPE ELEMENT ROSEMOUNT 176KF	
162 SOLENOID VALVE VALCOR V7090	
163 POWER SUPPLY WESTINGHOUSE HOT'S	The state of the s
164 PRESSURE TRANSMITTER FOXBURO E11GM	
165 PRESSURE TRANSMITTER FOXHORD E11GM	
166 PRESSURE CONTROLLER JOHNSON CONTROL: PC406	THE PARTY OF THE P
167 LEVEL TRANSMITTER BARTON 764 L	
168 PRESSURE TRANSMITTER BARTON 763 L	
169 LEVFI TRANSMITTER BARTON 764 L	A CONTRACTOR OF THE PROPERTY O
170 CONTROL SWITCH CUILEP HAMMER 10250	
171 CONTROL SWITCH CHILER HAMMER 10250	
172 FLOW SWITCH DWYFR 1627	AUXILIARY RUILDING
1/3 Tenegrature deliter	AND 1540 AUXILIARY BUILDING
174 TEMPERATURE SWITCH FERWAR, 18003	
1/3 EDECIFICAD CASAG	TATED CONTAINMENT
1/0 EUGLIBIUM CACUL	TATED INSIDE AND OUTSIDE CONTAINMENT
1// EDSCIBILAD CACH	TATED INSIDE AND OUTSIDE CONTAINMENT
1 10 EPPLIKITAD CHUPE	TATED INSIDE AND OUTSIDE CONTAINMENT
179 LIMIT SWITCH BARCO EA170	
180 LIMIT SWITCH HARCO EA170	
181 LIMIT SWITCH NAMED EATON	
182 LIMIT SWITCH NAMED EATON	
183 SOLENOID VALVE ASCO 20638	CONTAINHENT

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

EQUIPMENT ITEM NO. 1

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING AND ANNULUS

LINK-BELT MODELS TN200/TN2000

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 1

LICENSEE REFERENCE(S): 3008

FUNCTION (PLANT ID): CONTROL AND ISOLATION VALVE (FCV 67-123, -125, -127,

-128, -146, -147, -151, -152, -233)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-005 (TABLE 3.11-6/6; TABLE 3.11-8/22)

FUNCTION (PLANT ID): CONTROL AND ISOLATION VALVE (FCV 67-205, -208)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-005 (TABLE 3.11-6/6; TABLE 3.11-8/17)

FUNCTION (PLANT ID): AUXILIARY BUILDING ERCW HEADER A & B ISOLATION VALVE

(FCV 67-81, -82)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-005 (TABLE 3.11-7/3; TABLE 3.11-8/31)

FUNCTION (PLANT ID): CONTAINMENT SPRAY HEAT EXCHANGER A AND B DISCHARGE VALVE

(FCV 67-126, -124)

LICENSEE SUBMITTAL: MEB 67-005 (TABLE 3.11-7/3; TABLE 3.11-8/29)

FUNCTION (PLANT ID): UPPER AND LOWER CONTAINMENT COOLERS SUPPLY AND DISCHARGE

ISOLATION VALVES (FCV 67-83, -88, -91, -96, -99, -104,

all others

72 75 70

-107, -112)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-005 (TABLE 3.11-5/3)

(See Section 3 of this TER for Legend) FCV 67-83,-88,-91,-96,-99,-104,-107,-112

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:

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
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

	EQUI	PMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
			ESIGNATIO	
NRC REQ	UIREMENTS	<u>x</u>	= DEFICIE	NCY
Documen	ted Evidenc	e of Qualification Adequate		
		y Between Equipment and Test Specimen Establish	ed	XXX
Aging D	egradation	Evaluated Adequately		
Qualifi	ed Life or	Replacement Schedule Established (If Required)	_	X
Program	Establishe	d to Identify Aging Degradation		X
Criteri	a Regarding	Aging Simulation Satisfied (If Required)	-	X
Criteri	a Regarding	Temperature/Pressure Exposure:		
		ature Adequate		
	Peak Pressu			
0	Duration Ad	equate	-	-
0	Required Pr	ofile Enveloped Adequately	_	
		ure (If Required) Adequate	_	
		Spray Satisfied	_	
		Submergence Satisfied	_	
		Radiation Satisfied	_	
		Test Sequence Satisfied	_	
Criteri	ia Regarding	Test Failures or Severe Anomalies		
	Any) Satisfi		_	
		Functional Testing Satisfied	_	
		Instrument Accuracy Satisfied		
Test Du	uration Marg	in (1 hour + Function Time) Satisfied		
Criter	ia Regarding	Margins Satisfied (NUREG-0588, Cat. I)	_	
			DESIGNAT	TION:
una on		CAMPCODY	X = CATE	
NRC QUA	ALIFICATION	CATEGORY	A - CHIL	200111
I.a		Qualified		
I.b		Qualification Pending Modification	_	~
II.a	Equipment	Qualification Not Established	_	1
II.b	Equipment	Not Qualified		X
II.c	Equipment	Satisfies All Requirements Except Qualified Li	fe	
	or Replace	ement Schedule Justified		
III.a	Equipment	Exempt From Qualification		
III.b	Equipment	Not in the Scope of the Qualification Review	-	
IV		tion Not Made Available		

SUMMARY OF LICENSEE RESPONSES TO THE	E NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/kas not) provi	ided a response to the SER concerns.
	ifically stated that the equipment is when exposed to the applicable DBE
The Licensee has presented infor outstanding qualification defici	mation which shows there are no encies.
The Licensee (has/has not) proporties whose qualification has not	esed a corrective action for this equipment been fully established.
Justification for interim op Licensee for this equipment	peration (has/has not) been provided by the item.
Corrective action specified	by the Licensee:
Equipment replacement wi Equipment modification Equipment relocation abo Relocate or shield equip Verify qualification by Equipment relocation to Qualification testing of Other (ove submergence level ment from radiation source additional (testing/analysis) a mild environment
	her information for this equipment item asis for justification for interim
	rovided a schedule for the proposed e for accomplishing the corrective
The Licensee states that the equand/or should be exempted from e	ipment item does not require qualification nvironmental qualification.
	CATION 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.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

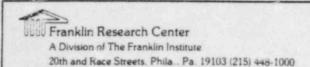
LICENSEE RESPONSE TO NRC SER

- a. The valve motor operators are qualified by test of model TN-200. The model TN-2000 is qualified by equivalance to the TN-200 operator. The test is described in the Franklin Institute Research Laboratories Report No. F-C2883.
- b. The testing sequence was as follows:
 - 1. Radiation 1 by 108 rad
 - 2. Seismic
 - 3. 6 day steam and simultaneous 5 hour chemical spray exposure starting at 90 psig/330°F and reduced gradually to 5 psig/ 225°F.
- c. The test subjected the actuator to the temperature pressure profile illustrated in attachment 1.
- d. The test conditions correspond to those for saturated steam or 100 percent relative humidity.
- e. The above test conforms to the requirements set forth in IEEE-323-1971 and NUREC-0588, section 2.2, all applicable paragraphs for the application.
- f. The operating conditions to which these operators will be subjected are within tested parameters.
- g. Operating time The subject test report does not specifically address this, however, the test parameters (see above) are significantly more severe than our worst case environment (150°F, ATM Press, 100 percent RA and 5 by 107 rads), therefore, it's our engineering judgment the test is sufficient to meet the required operating time.

Prepared by:

Reviewed by:

RJP8



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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 579 526

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				an and a		
Checksheets	50 through	5i	have been	removed d	ue to the	
proprietary natur	e of information	n contair	ed therein.			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

EOUIPMENT ITEM NO. 2 MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (GENERAL SPACES AND INDIVIDUALLY COOLED ROOMS) LINK-BELT MODELS TN200/TN2000 REQUIRED OPERATING TIME: 1 YEAR TER CHECKSHEET NO. 2 LICENSEE REFERENCE(S): 3008 FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVES (FCV70-2, -3, -4, -8, -9, -10, -11, -12, -15, -40, -41, -193, -194, -195, -196, -197, -198) LICENSEE SUBMITTAL: SCEW(S): MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/22) FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVES (FCV70-13, -22, -23, -25, -26, -27, -34, -39, -64, -74) LICENSEE SUBMITTAL: SCEW(S): MEB 70-004 (TABLE 3.11-7/20; TABLE 3.11-8/5) FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVES (FCV70-14, -16, -18, -28, -29)LICENSEE SUBMITTAL: SCEW(S): MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/19) FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV70-75, -168) LICENSEE SUBMITTAL: MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/12) FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV70-76, -78) LICENSEE SUBMITTAL: MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/15)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALUE (FCV 70-111) LICENSEE SUBMITTAL: MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/11)

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

(See Section 3 of this TER for Legend) FCV 70-14, -15-18, -28, -29, -40, -75 -76, -78

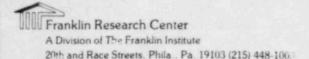
(R,T) (RT) P H) CS, A S, (R), M I, QM RPN, EXN, SEN, QI RPS, None,

Not stated, Not applicable FCV-70-1

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la,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, 4£
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. 2

EQUIPMENT ITEM NO. 2 (CONTINUED)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV 70-153, -156) LICENSEE SUBMITTAL: MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/5)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV 70-92, -139, -140,

-143)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-004 (TABLE 3.11-7/3; TABLE 3.11-8/35)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV 70-1) LICENSEE SUBMITTAL: SCEW(S): MEB 70-004 (TABLE 3.11-7/16)

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	la
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

SUMMARY OF LICENSEE RESPONSES TO THE NR	C SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/has not) provided	a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented informat outstanding qualification deficience	
The Licensee (has/has not) proposed item whose qualification has not be	a corrective action for this equipment en fully established.
Justification for interim opera Licensee for this equipment ite	tion (has/has not) been provided by the m.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipmen	t from radiation source
Verify qualification by add	
Equipment relocation to a m	
Qualification testing of eq	
Other ()
	information for this equipment item s for justification for interim
	ided a schedule for the proposed or accomplishing the corrective
The Licensee states that the equipm and/or should be exempted from envi	ent item does not require qualification ronmental qualification.
DESTONATION OF DESIGNATION NO. OUR TRYON	TON PURT HAMYON CAMPCODY CACOO ON ADVINCE
- CIRCLED ITEM ONLY: (See Section 3 of	
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 SUMMARY FORM	
NPC PEC		ESIGNATION: = DEFICIENCY
MIC ROS	O I real to	
Adequat	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Establish	ed X
Aging D	egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Required)	X
Program	Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	-
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	nny) Satisfied	
	a Regarding Functional Testing Satisfied	
	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NPC OUZ	ALIFICATION CATEGORY	X = CATEGORY
MANC DOS	mar ton the contract of the co	
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	e
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	Married (47 MM
IV	Documentation Not Made Available	
evi	per to Equipment item * 1 for a discourse of the referenced report review nilar equipment exposed to The same	wed for
m	re seriere environment.	

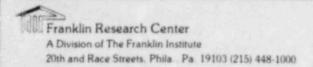
LICENSEE RESPONSE TO MRC SER

- Motor-Operated Valves (1'3V) Link-Belt Electrodyne Model TN-200 and TN-2000
 - a. The valve motor operators are qualified by test of model TN-200. The model TN-2000 is qualified by equivalence of the TN-200 operator. The test is described in the Franklin Institute Research Laboratories Report No. F-C2883.
- b. The testing sequence was as follows:
 - 1. Radiation 1 by 108 rads
 - 2. Seismic
 - 6 day steam and simultaneous 5 hour chemical spray exposure starting at 90 psig/330°F and reduced gradually to 5 psig/ 225°F.
- c. The test subjected the actuator to the temperature pressure profile illustrated in attachment 1.
- d. The test conditions correspond to those for saturated steam or 100 percent relative humidity.
- e. The above test conforms to the requirements set forth in IEEE-323-1971 and NUREG-0588, section 2.2, all applicable paragraphs for the application.
- f. The operating conditions to which these operators will be subjected are within tested parameters.
- g. Operating time The subject test report does not specifically address this, however, the test parameters (see above) are significantly more severe than our worst case environment (202°F, ATM Press, 100 percent RA and 5 by 107 rads), therefore, it's our engineering judgment the test is sufficient to meet the required operating time.

Prepared by:

Reviewed by:

RJP10



PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13,
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

EQUIPMENT ITEM NO. 3

MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST VALVE ROOMS

CHICAGO FLUID POWER MODEL TVA-01-0577 REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 3

LICENSEE REFERENCE(S): 4277, 4278

FUNCTION (PLANT ID): ISOLATION VALVE (FSV1-4A, B, D, E, F, G, H, J; FSV1-29A,

B, D, E, F, G, H, J)

LICENSEE SUBMITTAL: SCEW(S): MEB 1-003 (TABLE 3.11-8/3)

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, RPM, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 5o, 5d, 5e , 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6 b
Maintenance and Replacement Schedule Summary	7a, 7b, 7e

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X The Licensee (has/has not) provided a response to the SER concerns. X The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions. X The Licensee has presented information which shows there are no outstanding qualification deficiencies. The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
qualified and/or will function when exposed to the applicable DBE environmental service conditions. X The Licensee has presented information which shows there are no outstanding qualification deficiencies. The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established. Justification for interim operation (has/has not) been provided by the Licensee for this equipment item. Corrective action specified by the Licensee: Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress Other (The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim
outstanding qualification deficiencies. The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
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 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 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 (
that can be construed as a basis for justification for interim
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 VALUE ICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)
I.a Qualified II.c Qualified Life Deficiency II.a Qualification Not Stablished III.b Not in Scope II.b Not Qualified IV Documentation Not Available

NRC Contract No. NRC-03-79-118
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	DESIGNATION: X = DEFICIENCY
NRC REQUIREMENTS	7 500 2000000
Occumented Evidence of Qualification Adequate	
dequate Similarity Between Equipment and Test Specimen Es	tablished
ging Degradation Evaluated Adequately	
qualified Life or Replacement Schedule Established (If Req	uired)
rogram Established to Identify Aging Degradation	
Criteria Regarding Aging Standation Satisfied (If Required)
Criteria Regarding Temperature/Pressure Exposure:	
o look Temperature Adequate	1
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposur@ (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
riteria 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)	
receive regarding ner year	
	DESIGNATION:
NRC QUALIFICATION CATEGORY	X = CATEGORY
The Company of the Co	
a Equipment Qualified	
Equipment Qualification Pending Modification	
I.a Equipment Qualification Not Established	
I.b Equipment Not Qualified	The second second
II.c Equipment Satisfies All Requirements Except Qualif	Red Life
or Replacement Schedule sustified	
III.a Equipment Exempt From Qualification	
III.b Equipment Not in the Scope of the Qualification Re	view

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

LICENSEE RESPONSE TO NRC SER

The valve actuator complete with solenoids and limit switches is qualified as described in A&M's report No. 201-39500.

The test objective was to qualify the actuator assembly to the requirements of IEEE 323, 344, and 382.

The test sequence was as follows:

- 1. Mechanical life test -4800 cycles.
- 2. Radiation 1.74 X 107.
- Thermo cyclic aging test 612 cycles at 225° F
- 4. Seismic.
- 5. Environmental See sheet 2.

Operating Time . No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results, in our judgment, more than satisfy this requirement.

The operating conditions to which these motor operators will be subjected to are within tested parameters.

Prepared by:

Reviewed by:

E71023.07

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

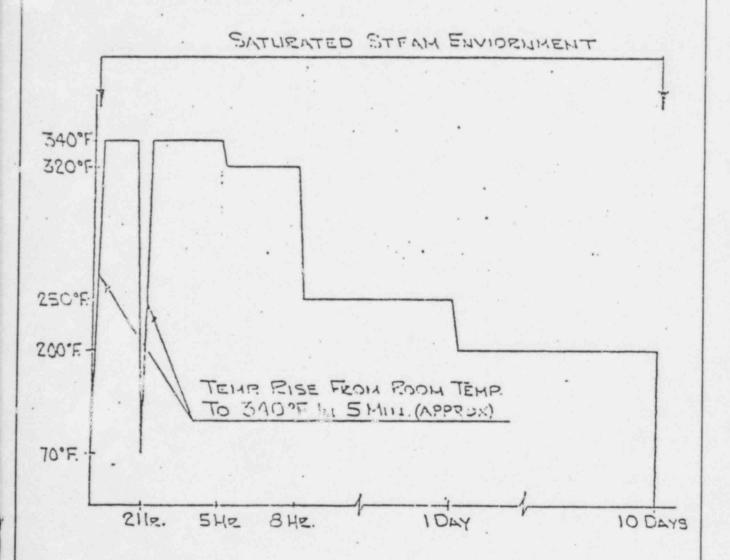
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

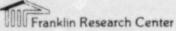
LICENSEE RESPONSS TO NRC SER (Continued)

STR-030578-1

FIGURE 5



ABNORMAL ENVIRONMENT (LOCA) TEMPERATURE CURVE



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NOTES:
A. The licensel's submittal of The referenced
seports (PGR # 4277 and 4278) donsisted
only of copies of The fransmittel
letters and conce pages. The actual
body of The fist reports were not
submitted. Due to This fact, an
independent evaluation cannot be
med as to the qualification of this
egupment item.

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. __5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

EQUIPMENT ITEM NO. 4

MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST VALVE ROOM

CHICAGO FLUID POWER MODEL TVA-01-0577

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 4

LICENSEE REFERENCE(S): 4277, 4278

FUNCTION (PLANT ID): ISOLATION VALVE (FSV1-11A, B, D, E, F, G, H, J;

FSV1-22A, B, D, E, F, G, H, J)

LICENSEE SUBMITTAL: SCEW(S): MEB 1-003 (TABLE 3.11-8/4)

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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3a, 3d
System Consideration Review	4a, 4b, 4e, 4d, 4e, 46
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5£, 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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABL
X The Licensee (has/has not) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
X The Licensee has presented inform ourstanding qualification deficie	
The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided by the tem.
Corrective action specified b	y the Licensee:
	re submergence level ment from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

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. ___5/9/526_

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	ORM	
DESIGNATION:			
NRC REO	UIREMENTS	X = DEFICIENCY	
ocumen	ted Evidence of Qualification Adequate		
Adequat	e Similarity Between Equipment and Test Specimen Estab	lished	
Aging D	egradation Evaluated Adequately		
Qualifi	ed Life or Replacement Schedule Established (If Require	ed)	
Program	Established to Identify Aging Degradation		
Criteri	a Regarding Aging Simulation Satisfied (If Required)		
	a Regarding Temperature/Pressure Exposure:		
	Peak Temperature Adequate		
	Peak Pressure Adequate		
	Duration Adequate	***************************************	
0	Required Profile Enveloped Adequately		
	Steam Exposure (If Required) Adequate		
	a Regarding Spray Satisfied		
	a Regarding Submergence Satisfied		
	a Regarding Radiation Satisfied		
Criteri	a Regarding Test Sequence Satisfied		
	a Regarding Test Failures or Severe Anomalies		
	ny) Satisfied		
	a Regarding Functional Testing Satisfied	-	
	a Regarding Instrument Accuracy Satisfied		
rest Du	ration Margin (1 hour + Function Time) Satisfied a Regarding Margins Satisfied (NUREG-0588, Cat. I)		
criceri	a Regarding Margins Datistica (No. 2007) Control		
		DESIGNATION:	
NRC OUA	LIFICATION CATEGORY	X = CATEGORY	
201			
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 Revie	w	
IV	Documentation Not Made Available	X	
R	efer to equipment item # 3 for 5	The licinsus	
re	sponse and an evaluation	of This	
eg	supment item.		

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

EQUIPMENT ITEM NO. 5

ELECTROHYDRAULIC VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (CORRIDOR, ELEV. 690')

MEA MODEL MEA1 19K2

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 5

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MODIFIER-AFW PUMP VALUE ACTUATORS (PM-3-122, -132) LICENSEE SUBMITTAL: SCEW(S): EEB-1023 (TABLE 3.11-6/1; TABLE 3.11-8/16)

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, (M), RPN, EXN, SEN, QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

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

SUMM	MARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
<u>X</u>	The Licensee (has/has-not) provide	ded a response to the SER concerns.
-	The Licensee (has/has not) specification will function when the environmental service conditions.	
	The Licensee has presented inform outstanding qualification deficie	
_X	The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	X Justification for interim operation Licensee for this equipment is	eration (has/ has not) been provided by the tem.
	X Corrective action specified b	by the Licensee:
	X Verify qualification by a Equipment relocation to a Qualification testing of Other (The Licensee has provided oth that can be construed as a ba operation. X The Licensee (has/has not) pr corrective action. (Schedule	re submergence level ment from radiation source dditional (testing/analysis) mild environment
	The Licensee states that the equi	pment item does not require qualification
-	and/or should be exempted from en	로 (Table 1988) - 1985 -
-	GNATION OF RESULTANT NRC QUALIFIC RCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.b	Qualified Modification	II.c Qualified Life Deficiency III.a Exempt
ASSESSMENT OF THE PARTY OF THE	Qualification Not Established	III.b Not in Scope IV Documentation Not Available

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FRC Task No. 519 | 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Criceria 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 Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b

Documentation Not Made Available

IV

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

LICENSEE RESPONSE TO NRC SER

It has been determined that the components listed in appendix 1 do not have sufficient documentation. These components have been identified on Nonconformance Report No. <u>SONEEB8041</u>. Justification for continued safe operation and the definition of TVA's qualification or replacement plan are found in appendix 3.

Sheet No.	EEB	1023	
Revision		2	
Appendix	3		
Sheet 1	of	1	

The operators are required to operate in the following environment:

Temperature: 121° F Pressure: Atmospheric

Relative Humidity: 30-80% (100% Peak) Radiation: 40 years TID = 3.51×10^2 rads Accident = 1×10^4 rads

The manufacturer's specifications for the operators are as follows:

Temperature: 190° F Pressure: Atmospheric

Relative Humidity: NEMA 4-Enclosure

Radiation: Not Specified

The temperature and pressure environment in which the operators are located is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing and analysis are being performed by Wyle Laboratories.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

EQUIPMENT ITEM NO. 6

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING

LIMITORQUE MODEL SMB; SIZES 00, 000

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 6

LICENSEE REFERENCE(S): 662, 2876

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV70-183)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-012 (TABLE 3.11-6/6)

FUNCTION (PLANT ID): RCP THERMAL BARRIER CONTAINMENT ISOLATION VALVE

(FCV 70-90)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-012 (TABLE 3.11-7/3; TABLE 3.11-8/35)

FUNCTION (PLANT ID): CONDENSATE DEMINERALIZER WASTE EVAPORATOR CONTROL VALVE

(FCV 70-206)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-012 (TABLE 3.11-6/7; TABLE 3.11-8/11)

FUNCTION (PLANT ID): CONDENSATE DEMINERALIZER WASTE EVAPORATOR CONTROL VALVE

(FCV 70-207, -208)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-012 (TABLE 3.11-6/7; TABLE 3.11-8/24)

FUNCTION (PLANT ID): RCP THERMAL BARRIER CONTAINMENT ISOLATION VALVE (FCV

70-133, -134)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-012 (TABLE 3.11-7/3; TABLE 3.11-8/6)

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

(See Section 3 of this TER for Legend) FOR FCV 70-183, -90, -133, -134

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

Not stated, Not applicable

-207, -208

LISTING OF APPLICABLE CHECKSHEETS:

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

Installed TMI Lessons Learned Implementation 6a, 6b Equipment Summary

Maintenance and Replacement Schedule Summary 7a, 7b, 7s

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
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FRC Task No. _____5191526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has not) proposition whose qualification has not	ed a corrective action for this equipment been fully established.
X Justification for interim ope	ration (has/has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by acceptance of the control	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

EQUIPMENT ENVIRONMENTAL QUALIFIC	ATTON SUMMANT FORM				
	DESIGNATION:				
NRC REQUIREMENTS	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 Establi	Specimen Established X X X Shed (If Required) X				
Program Established to Identify Aging Degradat	ine				
Criteria Regarding Aging Simulation Satisfied	(If Required)				
Criteria Regarding Temperature/Pressure Exposu	re:				
	(If Required) re: for FCV-70-133,				
o Peak Temperature Adequate	for FCV-70-133, { X -134 { X				
o Peak Pressure Adequate o Duration Adequate	-13+ C -A				
	on 19				
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 And	omalies				
	7ma 2 2 0 0				
(If Any) Satisfied Criteria Regarding Functional Testing Satisfied					
Criteria Regarding Instrument Accuracy Satisfi	ed				
Test Duration Margin (1 hour + Function Time)	Satisfied				
Criteria Regarding Margins Satisfied (NUREG-05	588. Cat. I)				
Criteria Regarding Margins Sacisfied (No. 2007)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
	DESIGNATION:				
NRC QUALIFICATION CATEGORY	X = CATEGORY				
HRC QUALIFICATION CATEGORY					
I.a Equipment Qualified					
I.b Equipment Qualification Pending Modifi	ication				
II.a Equipment Qualification Not Established	ed X				
II.b Equipment Not Qualified					
II.c Equipment Satisfies All Requirements E	Except Qualified Life				
or Replacement Schedule Justified					
III.a Equipment Exempt From Qualification					
TIT h Paulinment Not in the Scope of the Qual	lification Review				

Documentation Not Made Available

IV

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

LICENSEE RESPONSE TO NRC SER

- a. The valve motor operator is qualified by test as described in Limitorque report B0003.
- b. The test objective was to qualify valves for Class 1E service outside primary containment using IEEE 382 as a guide.
- c. The testing sequence was as follows:
 - 1. Thermal aging 165°F and 100 percent RH for 200 hours.
 - Mechanical aging 200 Cycles during (1), 1800 additional cycles at room temperature.
 - 3. Radiation 2 by 107 rads.
 - 4. Seismic
 - 5. Environmental 250°F at 25 psig for 24 hears then 200°F at 10 psig for the remainder of 16 days.
- d. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have busined conducted and the results, in our judgment, more than satisfy this requirement.
- e. The operating conditions to which valve motor operators will be subjected to are within tested parameters with the exception of temperature and pressure (for FCV 70-133 and 134 only). However, similar Limitorque actuators have been tested to substantially higher temperatures and pressures (refer to Limitorque report B-0027).
- f. Aging-Limitorque states in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.

We believe that additional analysis and/or tests will show these actuators to be fully qualified for the service intended.

Prepared by:

Reviewed by:

RJP11

NOTES:		"X" DENOTES APPROPRIATE NOTES	
xxxx	1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)	
XXXX	2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.	
XXXX	3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.	
XXXX	4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).	
XXXX	5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.	
XXXX	6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).	
XXXX	7.	The Licensee has not identified the type of current used in the motorized valve actuator.	
XXXX	8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).	
XXXX	9.		
	10.	The Licensee has stated that the only harsh parameter page 5g that this motorized valve actuator is exposed to is radiation.	
1	11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.	
1	12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
 - B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

NOTES	Both the limit switch and the torque switch in these devices are usually
	constructed of a phenolic material which would not experience significan
	degradation due to thermal effects. However, the motor lead insulation
	material is usually an organic compound and will suffer thermal degrad-
	ation. The licensee should address this component, as well as any
	motor-brake assemblies which may be installed, for both thermal aging
	and radiation qualification. The licensee should be aware that Teflon
	has been used in this application (i.e. motor lead insulation) in some
	cases.
	FOR FCV-70-133, -134 only
	The Science has noted That The specified
	qualified Surgusture and propule. The Usingse of meto That 80027 Tested
	and prevenes Than the accident conditions.
	However, rimilarity to either report has
	me nen meneralianea.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

EQUIPMENT ITEM NO. 7

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, PIPE C

LIMITORQUE MODEL SMB; SIZE 000

REQUIRED OPERATING TIME: NOT STATED

20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

TER CHECKSHEET NO. 7

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): CONTAINMENT SPRAY RECIRCULATION FLOW ISOLATION VALVE

(FCV 72-13, -34)

LICENSEE SUBMITTAL: SCEW(S): MEB 72-013 (TABLE 3.11-7/2; TABLE 3.11-8/34)

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:

Maintenance and Replacement Schedule Summary

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

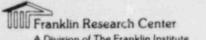
7a, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
_X The Licensee (has/has not) specification who denote the conditions will function who denote the conditions.	
_X The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not has	ed a corrective action for this equipment been fully established.
J.stification for interim open Licensee for this equipment is	ration (has/has not) been provided by the
Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification	
Equipment relocation above	
Relocate or shield equipme	
Verify qualification by ac	iditional (testing/amalysis)
Equipment relocation to a	
Qualification testing of e	equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from envi	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NEC CHALLETO	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 c	of this TER for Legend)
I.a Qualified	TT - Overlished tile Date
I.b Modification	II.c Qualified Life Deficiency III.a Exempt
III.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY					
Documented Evidence of Qualification Adequ	ate					
Adequate Similarity Between Equipment and	Test Specimen Established					
Aging Degradation Evaluated Adequately						
Qualified Life or Replacement Schedule Est	ablished (If Required)					
Program Established to Identify Aging Degr	Test Specimen Established X X Ablished (If Required) Adation ied (If Pequired)					
Criteria Regarding Aging Simulation Satisf	ied (ir Required)					
Criteria Regarding Temperature/Pressure Ex	posure:					
o Peak Temperature Adequate						
o Peak Pressure Adequate						
o Duration Adequate						
o Required Profile Enveloped Adequate						
o Steam Exposure (If Required) Adequa						
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 Sati	sfied					
Criteria Regarding Instrument Accuracy Sat						
Test Duration Margin (1 hour + Function Ti						
Criteria Regarding Margins Satisfied (NURE	G-0588, Cat. I)					
	DESIGNATION:					
NRC QUALIFICATION CATEGORY	X = CATEGORY					
THE CONDITION ONLY						
I.a Equipment Qualified						
I.b Equipment Qualification Pending Mo	dification					
II.a Equipment Qualification Not Establ	ished X					
II.b Equipment Not Qualified	diffication X ished X ats Except Qualified Life					
II.c Equipment Satisfies All Requiremen	ts Except Qualified Life					
or Replacement Schedule Justified						
III.a Equipment Exempt From Qualification	on					
III.b Equipment Not in the Scope of the	Qualification Review					
IV Documentation Not Made Available						

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

LICENSEE RESPONSE TO NRC SER

Limitorque Model SMB-000

- a. The valve motor operator is qualified by test as described in Limitorque report B0003.
- b. The test objective was to qualify valves for Class 1E service outside primary containment using IEEE 382 as a guide.
- c. The testing sequence was as follows:
 - 1. Thermal aging 165°F and 100 percent RH for 200 hours.
 - Mechanical aging 200 Cycles during (1), 1800 additional cycles at room temperature.
 - 3. Radiation 2 by 107 rads.
 - 4. Seismic
 - 5. Environmental 250°F at 25 psig for 24 hours then 200°F at 10 psig for the remainder of 16 days.
- d. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results, in our judgment, more than satisfy this requirement.
- e. The operating conditions to which valve motor operators will be subjected to are wit. In tested parameters.
- f. Aging-Limitorque states in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.

Prepared by:

Reviewed by:

E60340.09

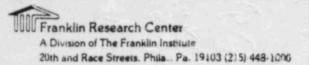
NOTES:		"X" DENOTES APPROPRIATE NOTES
XXXX	1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX	2.	
XXXX	3.	
XXXX	4.	
XXXX	5.	
XXXX	6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
XXXX	7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX	8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
XXXX	9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B,
	10.	
	11.	
	12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
 - B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.



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FRC Task No. S19 / S Z &

Page 5h

NOTES: Both the limit switch and the torque switch in these devices are usually
constructed of a phenolic material which would not experience significan
degradation due to thermal effects. However, the motor lead insulation
material is usually an organic compound and will suffer thermal degrad-
ation. The licensee should address this component, as well as any
motor-brake assemblies which may be installed, for both thermal aging
and radiation qualification. The licensee should be aware that Teflon
has been used in this application (i.e. motor lead insulation) in some
cases.

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FRC Task No. _5/9/526

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ITEM NO. 8

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (INDIVIDUALLY COOLED ROOMS)

LIMITORQUE MODEL SMB; SIZES 1, 2

REQUIRED OPERATING TIME: 1 DAY TO 1 YEAR

TER CHECKSHEET NO. 8

LICENSEE REFERENCE(S): 662, 663

FUNCTION (PLANT ID): CONTAINMENT SPRAY HEADER A AND B ISOLATION VALVES

(FCV 72-2, -39)

LICENSEE SUBMITTAL: SCEW(S): MEB 72-010 (TABLE 3.11-7/3; TABLE 3.11-8/27)

FUNCTION (PLANT ID): CONTAINMENT SPRAY HEADER A AND B ISOLATION VALVES

(FCV 72-20, -23, -21, -22)

LICENSEE SUBMITTAL: SCEW(S): MEB 72-010 (TABLE 3.11-7/3; TABLE 3.11-8/35)

FUNCTION (PLANT ID): CONTAINMENT SPRAY RECIRCULATION FLOW ISOLATION VALVES

(FCV 72-40, -41)

LICENSEE SUBMITTAL: SCEW(S): MEB 72-010 (TABLE 3.11-7/2; TABLE 3.11-8/34)

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, QT

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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,	
Equipment Environmental Qualification Review	5a, 5b, 5a, 5d, 5e , 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

Maintenance and Replacement Schedule Summary 7a, 7b, 7a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. $\underline{\mathcal{S}}$

SUMMARY OF LICENSEE RESPONSES TO THE NRO	SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/has not) provided	a response to the SER concerns.
The Licensee (has/has not) specificate qualified and/or will function when environmental service conditions.	
The Licensee has presented information outstanding qualification deficience	
The Licensee (has/has not) proposed item whose qualification has not been	a corrective action for this equipment on fully sstablished.
X Justification for interim operation Licensee for this equipment item	tion (has/has not) been provided by the
X Corrective action specified by	the Licensee:
Equipment replacement with o	qualified equipment
Equipment relocation above s	submergence level
Relocate or shield equipment	from radiation source
X Verify qualification by add:	itional (testing/analysis)
Equipment relocation to a m	ild environment
Qualification testing of equalification Other (uipment in progress
The Licensee has provided other that can be construed as a basis operation.	information for this equipment item s for justification for interim
The Licensee states that the equipment and/or should be exempted from environmental and an exempted from exempted	ent item does not require qualification ronmental qualification.
DESTANDATION OF DESIGNATION AND OUR TEXAS	TON BURLUAMION CAMPGODY CAGED ON DESCRIPTION
DESIGNATION OF RESULTANT NRC QUALIFICAT	
- CIRCLED ITEM ONLY: (See Section 3 of	chis led for lagend)
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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FRC Task No. __519/526_

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ENVIRONMENTAL QUALIFICATIO			
NDG PROUT PENDAME	DESIGNATION: X - DEFICIENCY		
NRC REQUIREMENTS	X - DEFICIENCE		
Documented Evidence of Qualification Adequate			
Adequate Similarity Between Equipment and Test Spe	d (If Required)		
ging Degradation Evaluated Adequately			
Qualified Life or Replacement Schedule Established	d (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	했다. 14 - 17 - 18 14 1 - 17 - 1 1 11 11 1		
o Required Profile Enveloped Adequately			
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 Anomal	ies		
(If Any) Satisfied			
Criteria Regarding Functional Testing Satisfied			
Criteria Regarding Instrument Accuracy Satisfied			
Test Duration Margin (1 hour + Function Time) Sat	isfied		
Criteria Regarding Margins Satisfied (NUREG-0588,	Cat. I)		
	DESIGNATION:		
NRC QUALIFICATION CATEGORY	X = CATEGORY		
I.a Equipment Qualified			
I.b Equipment Qualification Pending Modificat	ion		
II.a Equipment Qualification Not Established	X		
II.b Equipment Not Qualified	pt Oualified Life		
II.c Equipment Satisfies All Requirements Exce	pt Qualified Life		
or Replacement Schedule Justified			
III.a Equipment Exempt From Qualification			
III h Rouinment Not in the Scope of the Qualifi	cation Review		

Documentation Not Made Available

IV

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 519 1526 FRC Task No.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

LICENSEE RESPONSE TO NRC SER

Limitorque Model SMB-1 and SMB-2

- a. The valve motor operator is qualified by test as described in Limitorque Report F-C3271.
- b. The test objective was to qualify the actuators for service in a steam environment. The test consisted of a 12-hour exposure to an environment of saturated vapor, beginning with the introduction of steam and a temperature rise to about 212°F, followed after 6 hours by a temperature drop to about 155°F. The pressure was maintained at 7 inches water gage throughout the test. The performance of the actuator was monitored by cycling under load and measurement of insulation resistance on all power and control leads periodically during the test.
- c. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results, in our judgment, more than satisfy this requirement.
- d. The operating conditions to which these motor operators will be subjected to are within tested parameters with the exception of radiation. However, similar Limitorque actuators have been tested and qualified to substantially higher radiation levels (refer to Limitorque report B0003).
- e. Aging-Limitorque states in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.

We believe that additional analysis and/or tests will show these operators to be qualified for the pervice intended.

Reviewed by:

RJP13

NRC Contract No. NRC-03-79-118
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FRC Assignment No. 13
FRC Task No. ___519 | 526

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NOTES:		"X" DENOTES APPROPRIATE NOTES
XXXX	1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX	2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
XXXX	3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
XXXX	4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
XXXX	5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
XXXX	6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
XXXX	7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX	8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
XXXX	9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B
_	10.	The Licensee has stated that the only harsh parameter page 5g) that this motorized valve actuator is exposed to is radiation.
	11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
-	12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

- A. The licensee has not established similarity between the installed

 cquipment and the test specimen used in the referenced report(s). The

 licensee has not provided a letter from the manufacturer which would

 establish similarity via their records, nor have they sufficiently

 described the installed equipment enough to allow similarity to be

 established by other means (see page 5f). The licensee has not provided

 the serial number for the actuator or motor, nor have they provided

 the manufacturer's order number. This information would be necessary

 to establish similarity through the manufacturers records. In addition

 to those items identified on page 5f, the licensee should also identify

 the motor lead insulation material, the gear frame housing material,

 the type of limit switch and the type of torque switch (inside or outside

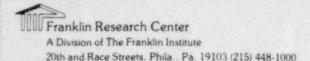
 containment). The licensee should be aware that Teflon has been used for

 motor lead insulation material in some cases.
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

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FRC Assignment No. 13
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Page 5h

NOTES:	Both the limit switch and the torque switch in these devices are usually
	constructed of a phenolic material which would not experience significant
	degradation due to thermal effects. However, the motor lead insulation
	material is usually an organic compound and will suffer thermal degrad-
	ation. The licensee should address this component, as well as any
	motor-brake assemblies which may be installed, for both thermal aging
	and radiation qualification. The licensee should be aware that Teflon
	has been used in this application (i.e. motor lead insulation) in some
	cases.
C.	No radiation Justing was performed in PGR
	#663 (F-C 327), however the licensee has
	stated That similar accurators were
	irradiated in report B0003 (PGR # 662).
	The licensee has not established That
	either of The referenced reports apply
	to This equipment item i.e. similarity has
	not been established. The licensee is
	analyzing The problem.



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Page la

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

EQUIPMENT ITEM NO. 9

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (CORRIDOR 690, AFWP TURBINE ROOM)

LIMITORQUE MODEL SMB; SIZES 00, 000 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 9

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): ERCW HEADER ISOLATION VALVE (FCV 116A, B; -126A, B)
LICENSEE SUBMITTAL: SCEW(S): MEB 3-007 (TABLE 3.11-7/20; TABLE 3.11-8/16)
FUNCTION (PLANT ID): FRCW TO AFWP TURBINE ISOLATION VALVE (FCV 3-136A, B;

-179A, B)

LICENSEE SUBMITTAL: SCEW(S): MEB 3-007 (TABLE 3.11-6/7; TABLE 3.11-8/1)

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

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

Not stated, Not applicable

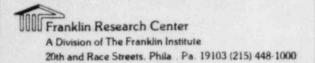
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/hes not) provide	ded a response to the SER concerns.
	fically stated that the equipment is nen exposed to the applicable DBE
X The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment in	eration (has/has not) been provided by the item.
Corrective action specified b	by the Licensee:
	ve submergence level
Verify qualification by a Equipment relocation to a Qualification testing of Other (
	ner information for this equipment item asis for justification for interim
	covided a schedule for the proposed of for accomplishing the corrective
The Licensee states that the equi	ipment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED ON REVIEW
I.a Qualified I.b Modification	II.c Qualified Life Deficiency
II.a Qualification Not Established	III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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FRC Assignment No. 13
FRC Task No. 519/526

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	그 사이 이 사람들이 그리가 되었다면 뭐 그리고 있는 사람들이 아니는 아니다 나는 아니다 그리고 있다면 하다 되었다.	DESIGNATION:
NRC REC	UIREMENTS	= DEFICIENCY
Documen	ted Evidence of Qualification Adequate	
	e Similarity Between Equipment and Test Specimen Establis	hed X
ging [egradation Evaluated Adequately	-
	ed Life or Replacement Schedule Established (If Required)	
rogram	Established to Identify Aging Degradation	
	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
riteri	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
	a Regarding Functional Testing Satisfied	7.00
	a Regarding Instrument Accuracy Satisfied	
rest Du	ration Margin (1 hour + Function Time) Satisfied	=
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
IPC OIL	ALIFICATION CATEGORY	X = CATEGORY
INC OUR	ELLICATION CATEGORI	
·a	Equipment Qualified	
.b	Equipment Qualification Pending Modification	
I.a	Equipment Qualification Not Established	X
I.b	Equipment Not Qualified	
I.c	Equipment Satisfies All Requirements Except Qualified Li	fe
	or Replacement Schedule Justified	
III.a	Equipment Exempt Prom Qualification	
	Equipment Not in the Scope of the Qualification Review	
d.III	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

LICENSEE RESPONSE TO NRC SER

- 2. Limitorque Model SMB-000 and SMB-00
 - a. The valve motor operator is qualified by test as described in Limitorque report B0003.
 - b. The test objective was to qualify valves for Class 1E service outside primary containment using IEEE 382 as a guide.
 - c. The testing sequence was as follows:
 - 1. Thermal aging 165°F and 100 percent RH for 200 hours.
 - Mechanical aging 200 Cycles during (1), 1800 additional cycles at room temperature.
 - 3. Radiation 2 by 107 rads.
 - 4. Seismic
 - 5. Environmental 250°F at 25 psig for 24 hours then 200°F at 10 psig for the remainder of 16 days.
 - d. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results in our judgment more than satisfy this requirement.
 - s. The operating conditions to which valve motor operators will be subjected to are within tested parameters.
 - f. Aging-Limitorquue states in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.

Prepared by:

Reviewed by:

RJP6

NOTES:	"X" DENOTES APPROPRIATE NOTES
<u>XXXX</u> 1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX 2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u>XXXX</u> 3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>xxxx</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>XXXX</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>XXXX</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>XXXX</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>XXXX</u> 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
XXXX 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B,
10.	
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

Page 5g

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
 - B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

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NOTES:
Both the limit switch and the torque switch in these devices are usually
constructed of a phenolic material which would not experience significant
degradation due to thermal effects. However, the motor lead insulation
material is usually an organic compound and will suffer thermal degrad-
ation. The licensee should address this component, as well as any
motor-brake assemblies which may be installed, for both thermal aging
and radiation qualification. The licensee should be aware that Teflon
has been used in this application (i.e. motor lead insulation) in some
cases.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

EQUIPMENT ITEM NO. 10

MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST VALVE ROOM

LIMITORQUE MODEL SMB; SIZES 00

REQUIRED OPERATING TIME: 15 MINUTES

TER CHECKSHEET NO. 10

LICENSEE REFERENCE(S): 662, 2876

FUNCTION (PLANT ID): ARW PUMP TURBINE SUPPLY FROM STEAM GENERATOR (FCV-1-15,

-16)

LICENSEE SUBMITTAL: SCEW(S): MEB 1-006 (TABLE 3.11-8/3) FUNCTION (PLANT ID): ISOLATION VALVE (FCV-1-17, -18) LICENSEE SUBMITTAL: SCEW(S): MEB 1-006 (TABLE 3.11-8/3)

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3 b, 30, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5o, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7e

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has-net) provid	ed a response to the SER concerns.
The Licensee (has/has not) specification will function when the environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
Y Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
The Licensee has provided other	e submergence level ent from radiation source dditional (testing/analysis) mild environment equipment in progress ound to be deficient) er information for this equipment item
that can be construed as a base operation.	sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW 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

A Division of The Franklin Institute 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000 RRC Contract No. NRC-03-79-118
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FRC Task No. ____519 1526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REC	UIREMENTS	DESIGNATION: X = DEFICIENCY
	ated Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished X X X X
	Degradation Evaluated Adequately	X
Oualifi	ed Life or Replacement Schedule Established (If Require	d) 🗶
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	_X_
	Peak Pressure Adequate	X
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	ia Regarding Test Sequence Satisfied	
Criteri	ia Regarding Test Failures or Severe Anomalies Any) Satisfied	
	a Regarding Functional Testing Satisfied	
	ia Regarding Instrument Accuracy Satisfied	
Test Di	uration Margin (1 hour + Function Time) Satisfied	
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC OU	ALIFICATION CATEGORY	X = CATEGORY
MIC DOL	THE POST OF THE PO	
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	

Page 3a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

LICENSEE RESPONSE TO NRC SER

- 2. Limitorque Model SMB-00 and SMB-000
 - a. The valve motor operator is qualified by test as described in Limitorque report B0003.
 - b. The test objective was to qualify valves for Class 1E service outside primary containment using IEEE 382 as a guide.
 - c. The testing sequence follow was as follows:
 - 1. Thermal aging 165°F and 100 precent RH for 200 hours.
 - Mechanical aging 200 cycles during (1), 1800 additional cycles at room temperature.
 - 3. Radiation 2 by 107 rads.
 - 4. Seismic
 - 5. Environmental 250°F at 25 psig for 24 hours then 200°F at 10 psig for the remainder of 16 days.
 - d. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results, in our judgment, more than satisfy this requirement.
 - e. The operating conditions to which these motor operators will be subjected to are within tested parameters with the exception of temperature and pressure. However, similar Limitorque actuators have been tested and qualified to substantially higher temperature and pressure (refer to Limitorque report B-0027).

We believe that additional analysis and/or tests will show these operators to be qualified for the service intended. However, if full qualification cannot be verified these operators will be replaced at the first outage following receipt of fully qualified units.

f. Aging-Limitorque scates in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.

Prepared by:

Reviewed by:

RJP2

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ___519 | 526

NOTES:		"X" DENOTES APPROPRIATE NOTES
xxxx	1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX	2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
XXXX	3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
XXXX	4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
XXXX	5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
XXXX	6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
XXXX	7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX	8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
XXXX	9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B,
	10.	The Licensee has stated that the only harsh parameter page 5g) that this motorized valve actuator is exposed to is radiation.
	11.	
-	12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

Page 5h

	constructed of a phenolic material which would not experience significant
	degradation due to thermal effects. However, the motor lead insulation
	material is usually an organic compound and will suffer thermal degrad-
	ation. The licensee should address this component, as well as any
	motor-brake assemblies which may be installed, for both thermal aging
	and radiation qualification. The licensee should be aware that Teflon
	has been used in this application (i.e. motor lead insulation) in some
	cases.
C.	The licensee has noted That the
	specified temperature and pressure
	exceed The qualified temperature and
	pressure. The licensic also notes that
	BOOD7 tested asimilar actuator to
	higher temperatures and pressures Than
	The accident conditions. However similari
	to either report has not been
	established.

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

EQUIPMENT ITEM NO. 11

MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST VALVE ROOM

LIMITORQUE MODEL SMB; SIZE 4
REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 11

LICENSEE REFERENCE(S): 663, 2876

FUNCTION (PLANT ID): ISOLATION VALVE (FCV 3-47, -87) LICENSEE SUBMITTAL: SCEW(S): MEB 3-011 (TABLE 3.11-8/4)

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,

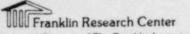
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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	7 a, 7b, 7a

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	ed a response to the SER concerns.
The censee (has/has not) specification who environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
X Justification for interim ope	ration (has/ has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment replacement wit Equipment modification Equipment relocation above	
Verify qualification by a Equipment relocation to a Qualification testing of Other (dditional (testing/analysis) mild environment
The Licensee has provided other that can be construed as a bar operation.	er information for this equipment item sis for justification for interim
The Licensee (has not) processive action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW
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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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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		DESIGNATION:
NRC REC	UIREMENTS	- DELICIENCE
Documer	ted Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establis	shed X X X X
Aging I	egradation Evaluated Adequately	_X_
Qualifi	ed Life or Replacement Schedule Established (If Required)	_X_
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	_ <u>X</u>
0	Peak Pressure Adequate	
	Duration Adequate	
0	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
Criteri	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	=
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criter	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	LIFICATION CATEGORY	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 L	ife
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
d.III	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. //

LICENSEE RESPONSE TO NRC SER

Limitorque Model SMB-4

- a. The valve motor operator is qualified by test as described in Limitorque report F-C3271.
- b. The test objective was to qualify the actuators for service in a steam environment. The test consisted of a 12-hour exposure to an environment of saturated vapor, beginning with the introduction of steam and a temperature rise to about 212°F, followed after 6 hours by a temperature drop to about 155°F. The pressure was maintained at 7 inches water gage throughout the test. The performance of the actuator was monitored by cycling under load and measurement of insulation resistance on all power and control leads periodically during the test.
- c. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results, in our judgment, more than satisfy this requirement.
- d. Note that the temperature and pressure of the accident environment in which the actuators must operate, exceed the qualification of the subject Limitorque report. However, similar Limitorque actuators have been tested and qualified to substantially higher temperatures and pressures (refer to Limitorque Report B-Q027).

We believe that additional analysis and/or tests will show these operators to be qualified for the service intended.

e. Aging-Limitorque states in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.

Prepared by:

Reviewed by:

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. 519/ 526

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NOTES:	"X" DENOTES APPROPRIATE NOTES
<u> </u>	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
<u>xxxx</u> 2.	
XXXX 3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>XXXX</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>XXXX</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
<u>XXXX</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>XXXX</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
<u>XXXX</u> 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>xxxx</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B,
10.	
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
 - B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

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	Both the limit switch and the torque switch in these devices are usual
	constructed of a phenolic material which would not experience significa
	degradation due to thermal effects. However, the motor lead insulation
	material is usually an organic compound and will suffer thermal degrad-
	ation. The licensee should address this component, as well as any
	motor-brake assemblies which may be installed, for both thermal aging
	and radiation qualification. The licensee should be aware that Teflon
	has been used in this application (i.e. motor lead insulation) in some
	cases.
C.	The licensee has noted That The specified
	Jempuature and pressure exceed The
	qualified Simpuature and pressure. The
	becinese also notes Trat 80027 Tested
	a similar retigator to higher temperatures
	and pressures Than The accident conditions.
	However, similarity to either report has
	not been established.

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. _ 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. /2

EQUIPMENT ITEM NO. 12

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, INDIVIDUALLY

COOLED ROOMS

LIMITORQUE MODEL SMB; SIZE 00 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 12

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): MOB-RCP SPRAY ANNULUS STANDPIPE AND SPRINKLER SYSTEM

ISOLATION VALVE (FCV 26-240, -241, -242)

LICENSEE SUBMITTAL: SCEW(S): MEB 26-008 (TABLE 3.11-7/3; TABLE 3.11-8/31)

FUNCTION (PLANT ID): MOB-RCP SPRAY ANNULUS STANDPIPE AND SPRINKLER SYSTEM

ISOLATION VALVE (FCV 26-244, 245)

LICENSEE SUBMITTAL: SCEW(S): MEB 26-008 (TABLE 3.11-7/3)

FUNCTION (PLANT ID): MOB-RCP SPRAY ANNULUS STANDPIPE AND SPRINKLER SYSTEM

ISOLATION VALVE (FCV 26-243)

LICENSEE SUBMITTAL: SCEW(S): MEB 26-008 (TABLE 3.11-7/3; TABLE 3.11-8/29)

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend) -FCV-26,-240, -241,-242,-243 RT, (P) (H) CS, (A) S, (R) / M, I, (M,) RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

FCV-26-244, -245

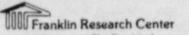
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3t, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5a, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	63,-612

Maintenance and Replacement Schedule Summary

Page

SUMMARY OF LICENSEE RES	SPONSES TO THE NI	RC SER - ONLY CHECKE	D ITEMS ARE APPLICABLE
X The Licensee (has/4	nas not) provided	a response to the	SER concerns.
	ill function when	cally stated that the exposed to the app	
X The Licensee has product outstanding qualification		ion which shows the	re are no
		a corrective actionen fully established	n for this equipment
	for interim operatis equipment ite		been provided by the
Corrective acti	on specified by	the Licensee:	
Equipment m Equipment r Relocate or Verify qual Equipment r	elocation above shield equipment ification by addition to a m	qualified equipment submergence level t from radiation so itional (testing/an ild environment uipment in progress	urce alysis)
The Licensee ha	s provided other strued as a basi	information for th s for justification	is equipment item for interim
		ided a schedule for or accomplishing th	
The Licensee states and/or should be ex	that the equipm empted from envi	ent item does not r ronmental qualifica	equire qualification tion.
DESIGNATION OF RESULTAN - CIRCLED ITEM ONLY: (T NRC QUALIFICAT See Section 3 of	this TER for Legen	GORY BASED ON REVIEW
I.a Qualified I.b Modification II.a Qualification Not	Established7	II.c Qualified Li III.a Exempt III.b Not in Scope	fe Deficiency
II.b Not Qualified			n Not Available



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NRC REC	UIREMENTS	DESIGNATION: C = DEFICIENCY
	ted Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establis	shed X X X
Aging D	egradation Evaluated Adequately	X
Oualifi	ed Life or Replacement Schedule Established (If Required)	X
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied		
Criteri	a Regarding Test Failures or Severe Anomalies	
	nny) Satisfied	
	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criter	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUALIFICATION CATEGORY		X = CATEGORY
NRC QUA	ALIFICATION CATEGORI	
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 L	ife
	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	

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. /2

LICENSEE RESPONSE TO NRC SER

Limitorque Model SMB-00

- The valve motor operator is qualified by test as described in Limitorque report 3.0003.
- b. The test objective was to qualify valves for Class 1E service outside primary containment using IEEE 382 as a guide.
- The testing sequence was as follows:
 - 1. Thermal aging 165°F and 100 percent RH for 200 hours.
 - 2. Mechanical aging 200 Cycles during (1), 1800 additional cycles at room temperature.
 - 3. Radiation 2 by 107 rads.
 - 4. Seismic
 - 5. Environmental 250°F at 25 psig for 24 hours then 200°F at 10 psig for the remainder of 16 days.
- d. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results in our judgment, more than satisfy this requirement.
- e. The operating conditions to which value motor operators will be subjected to are within tested parameters.
- f. Aging-Limitorque states in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.

Raviewed by:

20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. /2

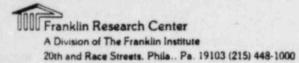
NOTES: "X" DENOTES APPROPRIATE NOTES XXXX 1. The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g) XXXX 2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator. XXXX 3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly. 4. The Licensee has not identified the class of the insulation XXXX system used for the motor-brake assembly (if applicable). 5. The Licensee has not identified the motor manufacturer for XXXX this motorized valve actuator. 6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable). 7. The Licensee has not identified the type of current used in the motorized valve actuator. XXXX 8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable) The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B, 10. The Licensee has stated that the only harsh parameter that this motorized valve actuator is exposed to is radiation. 11. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter. The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.



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-	Both the limit switch and the torque switch in these devices are usual
	constructed of a phenolic material which would not experience signific
	degradation due to thermal effects. However, the motor lead insulation
	material is usually an organic compound and will suffer thermal degrad
	ation. The licensee should address this component, as well as any
	motor-brake assemblies which may be installed, for both thermal aging
	and radiation qualification. The licensee should be aware that Teflon
	has been used in this application (i.e. motor lead insulation) in some
	cases.

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. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. /3

EQUIPMENT ITEM NO. 13

MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT

LIMITORQUE MODEL SMB; SIZE 000 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 13

LICENSEE REFERENCE(S): 706, 2876

FUNCTION (PLANT ID): LOWER CONTAINMENT COOLER DISCHARGE VALVE (FCV 67-87,

-95, -103, -111)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-014 (TABLE 3.11-4/5)

FUNCTION (PLANT ID): UPPER CONTAINMENT VENT COOLER (FCV 67-295, -296, -297,

-298)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-014 (TABLE 3.11-4/5)

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, (B) (S) (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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 30, 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

Page

SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	d a response to the SPR assessed
The bicensee (has/has the) provide	d a response to the SER concerns.
X The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is n exposed to the applicable DBE
X The Licensee has presented informa outstanding qualification deficien	
The Licensee (has/has not) propose item whose qualification has not be	d a corrective action for this equipment een fully established.
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided by the em.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipme	
Verify qualification by ad	
Equipment relocation to a i	
Qualification testing of e	quipment in progress
	r information for this equipment item is for justification for interim
	vided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipment and/or should be exempted from envi	ment item does not require qualification ironmental qualification.
DESTANAMION OF DEGITATION NO. OUR TETOLOGIC	TION BURLINGTON CHARGODY CLOSE ON THE
- CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON REVIEW
CINCULAR CHARLE (See Section 3 O.	curs tax for begenu)
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

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. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
		DESIGNATION:
NRC REQUIREM	ENTS	X = DEFICIENCY
Documented E Adequate Sim Aging Degrad Qualified Li Program Esta Criteria Reg O Peak O Peak O Durat O Requi O Steam Criteria Reg Criter	vidence of Qualification Adequate ilarity Between Equipment and Tes ation Evaluated Adequately fe or Replacement Schedule Establ blisned to Identify Aging Degrada arding Aging Simulation Satisfied arding Temperature/Pressure Expos Temperature Adequate Pressure Adequate ion Adequate red Profile Enveloped Adequately Exposure (If Required) Adequate arding Spray Satisfied arding Submergence Satisfied arding Radiation Satisfied arding Test Sequence Satisfied arding Test Failures or Severe An	ished (If Required) tion (If Required) ure: X X X X X X X X X X X X X X X X X X
NRC QUALIFIC	ATION CATEGORY	DESIGNATION X = CATEGOR
I.a Equi	pment Qualified	
	pment Qualification Pending Modif	Except Qualified Life
	pment Qualification Not Establish	ned X
	pment Not Qualified	
II.c Equ:	pment Satisfies All Requirements eplacement Schedule Justified	Except Qualified Life
	pment Exempt From Qualification	
	pment Not in the Scope of the Qua	lification Review
	mentation Not Made Available	

Page 3a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

LICENSEE RESPONSE TO NRC SER

- a. The valve motor operator is qualified by test as described in Limitorque report 600456.
- b. The test objective was to qualify valve actuators to the type test specified by IEEE Std. 382'-72' for service in a PWR containment chamber.
- c. The testing sequence was as follows:
 - 1. Thermal aging 180°C for 100 hours.
 - 2. Mechanical aging 1208 Cycles.
 - 3. Padiation 2 by 103 rads.
 - 4. Seismic
 - 5. Environmental Dec Sheet 2.
- d. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results, in our judgment, more than satisfy this requirement.
- e. Note that only temperature and pressure of the accident environment in which the actuators must operate, exceed the qualification of the subject Limitorque report. However, these actuators have been tested and qualified to substantially higher temperatures and pressures (refer to Limitorque Report 3-0027).
- f. Aging-Limitorque states in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.
- g. The subject test subjected the operator to a chemical spray mixture per Table 1 of IEEE 382 page 12.
- h. Humidity The test an over humidity was maintained at 100 percent throughout the test.

Prepared by:

Reviewed by:

8

RJP9

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NOTES:	"X" DENOTES APPROPRIATE NOTES
<u>xxxx</u> 1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
<u>xxxx</u> 2.	
<u>XXXX</u> 3.	
<u>XXXX</u> 4.	나도 이 도로 가게 가는 것도 그 때문에 있는데 그렇게 되었다. 이 일이 아름다면 하는데 하는데 되었다.
<u>XXXX</u> 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
XXXX 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>xxxx</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX 8.	The Licensee has not identified the type of current used in the motor-brake sesembly (if applicable).
XXXX 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B,
1.0.	
11.	
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
 - B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

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NOTES: Both the limit switch and the torque switch in these devices are usuall
constructed of a phenolic material which would not experience signification
degradation due to thermal effects. However, the motor lead insulation
material is usually an organic compound and will suffer thermal degrad-
ation. The licensee should address this component, as well as any
motor-brake assemblies which may be installed, for both thermal aging
and radiation qualification. The licensee should be aware that Teflon
has been used in this application (i.e. motor lead insulation) in some
cases.
C. The Sience Iso noted That The mention
Jempuntus and pressure exceed The
qualified demonstruce and principle. The
German also mates That 80027 Tented
a similar cotrector to higher timen times
and priorings from the accident conditions.
However similarity to either report has
not here cotablished.
more view permissioned.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

EQUIPMENT ITEM NO. 14

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (OPEN AREA, ELEV. 714')

LIMITORQUE MODEL SMB; SIZE 000 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 14

LICENSEE REFERENCE(S): 663

FUNCTION (PLANT ID): CONTROL VALVE (FCV 67-424)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-016 (TABLE 3.11-6/6; TABLE 3.11-8/21)

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	la
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	7 a, 7b, 7c

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519 526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
X The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided by the tem.
Corrective action specified by	the Licensee:
Equipment relocation to a Qualification testing of c Other (The Licensee has provided other	e submergence level ent from radiation source dditional (testing/analysis) mild environment
The Licensee (has/has not) pro	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	ment item does not require qualification ironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

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FRC Task No. 519 1536

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	RM			
		DESIGNATION:			
NRC REC	UIREMENTS	X = DEFICIENCY			
Documen					
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished X			
	Degradation Evaluated Adequately	ished X X A			
Qualifi	ed Life or Replacement Schedule Established (If Require	d) X			
	Established to Identify Aging Degradation				
Criteri	a Regarding Aging Simulation Satisfied (If Required)				
Criteri	a Regarding Temperature/Pressure Exposure:				
0	Peak Temperature Adequate				
0	Peak Pressure Adequate	-			
0	Duration Adequate				
0	Required Profile Enveloped Adequately	-			
0	energies to revene				
Criteri	a 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		
				ia Regarding Instrument Accuracy Satisfied	
	ration Margin (1 hour + Function Time) Satisfied				
	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)				
		DESIGNATION:			
NRC OU	ALIFICATION CATEGORY	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				

PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____519 1524

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

LICENSEE RESPONSE TO NRC SER

- 1. Limitorque Model SMB-000.
 - a. The valve motor operator is qualified by test as described in Limitorque Report F-C3271.
 - b. The test objective was to qualify the actuators for service in a steam environment. The test consisted of a 12-hour exposure to an environment of saturated vapor, beginning with the introduction of steam and a temperature rise to about 212° F. followed after 6 hours by a temperature drop to about 155° F. The pressure was maintained at 7 inches water gage throughout the test. The performance of the actuator was monitored by cycling under load and measurement of insulation resistance on all power and control leads periodically during the test.
 - c. The operating conditions to which valve motor operators will be subjected to are within tested parameters.
 - d. Aging-Limitorque states in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.

Prepared by:

Reviewed by:

R. D. D.

FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 519/ 526

NOTES:		"X" DENOTES APPROPRIATE NOTES
XXXX	1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX	2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
XXXX	3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
XXXX	4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
XXXX	5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
XXXX	6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
XXXX	7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX	8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
XXXX	9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B
	10.	The Licensee has stated that the only harsh parameter page 5g) that this motorized valve actuator is exposed to is radiation.
	11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
1	L2.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

Page 5g

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

NOTES:

- A. The licensee has not established similarity between the installed

 equipment and the test specimen used in the referenced report(s). The

 licensee has not provided a letter from the manufacturer which would

 establish similarity via their records, nor have they sufficiently

 described the installed equipment enough to allow similarity to be

 established by other means (see page 5f). The licensee has not provided

 the serial number for the actuator or motor, nor have they provided

 the manufacturer's order number. This information would be necessary

 to establish similarity through the manufacturers records. In addition

 to those items identified on page 5f, the licensee should also identify

 the motor lead insulation material, the gear frame housing material,

 the type of limit switch and the type of torque switch (inside or outside

 containment). The licensee should be aware that Teflon has been used for

 motor lead insulation material in some cases.
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

Both the limit switch and the torque switch in these devices are usually
constructed of a phenolic material which would not experience significant
degradation due to thermal effects. However, the motor lead insulation
material is usually an organic compound and will suffer thermal degrad-
ation. The licensee should address this component, as well as any
motor-brake assemblies which may be installed, for both thermal aging
and radiation qualification. The licensee should be aware that Teflon
has been used in this application (i.e. motor lead insulation) in some
cases.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ITEM NO. 15

MOTORIZED VALVE ACTUATOR LOCATED IN THE ANNULUS

LIMITORQUE MODEL SMB; SIZE 000 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 15

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): UPPER AND LOWER CONTAINMENT COCLERS SUPPLY AND DISCHARGE

ISOLATION VALVES (FCV-67-130, -131, -133, -134, -138,

-139, -141, -142)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-026 (TABLE 3.11-5/3)

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	la
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, 40, 4d, 40, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5 ;
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7e

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FRC Task No. __519/526_

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not it	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment is	ration (has/has not) been provided by the tem.
Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by acceptance of the second o	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective)
The Licensee states that the equipand/or should be exempted from envi	pment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
[II.a Qualification Not Established]	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

IV

Documentation Not Made Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

LICENSEE RESPONSE TO NRC SER

Limitorque - Model SMB-000

- a. The valve motor operator is qualified by test as described in Limitorque report B0603.
- b. The test objective was to qualify valves for Class 1E service outside primary containment using IEEE 382 as a guide.
- c. The testing sequence was as follows:
 - 1. Thermal aging 165°F and 100 percent RH for 200 hours.
 - Mechanical aging 200 Cycles during (1), 1800 additional cycles at room temperature.
 - 3. Radiation 2 by 107 rads.
 - 4. Seismic
 - 5. Environmental 250°F at 25 psig for 24 hours then 200°F at 10 psig for the remainder of 16 days.
- d. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results, in our judgment, more than satisfy this requirement.
- e. Aging-Limitorque states in their report that no detrimental effects were identified as a result of the cesting sequence described above and, therefore, is qualified for a 40-year life.
- f. The operating conditions to which these motor operators will be subjected to are within tested parameters.

Prepared by:

Raviewed by:

E60340.15

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. S19 | 526

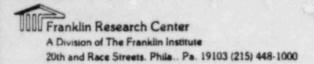
Page 5f

NOTES:	"X" DENOTES APPROPRIATE NOTES
<u>xxxx</u> 1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
<u>xxxx</u> 2.	
<u>XXXX</u> 3.	
<u>XXXX</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
XXXX 5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
XXXX 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>XXXX</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>XXXX</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B,
10.	
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
 - B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.



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NOTES:	
	Both the limit switch and the torque switch in these devices are usually
	constructed of a phenolic material which would not experience significant
	degradation due to thermal effects. However, the motor lead insulation
	material is usually an organic compound and will suffer thermal degrad-
	ation. The licensee should address this component, as well as any
	motor-brake assemblies which may be installed, for both thermal aging
	and radiation qualification. The licensee should be aware that Teflon
	has been used in this application (i.e. motor lead insulation) in some
	cases.
C.	In addition The licensee has stated
	That This equipment item will be
	addressed in The next version of the
	EEEQ2.
	나는 아이를 가는데 맛있다면 하는데 하는데 하는데 하는데 하는데 하는데 하다.
	전 등 경우는 보기를 되었다면서 가는 하는 경우를 받는 수 있다면 하는 경우를 받는다.
7770,	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

EQUIPMENT ITEM NO. 16

MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST VALVE ROOM

LIMITORQUE MODEL SMB; SIZE 4

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 16

LICENSEE REFERENCE(S): 663, 2876

FUNCTION (PLANT ID): ISOLATION VALVE (FCV 3-33, -100) LICENSEE SUBMITTAL: SCEW(S): MEB 3-009 (TABLE 3.11-8/3)

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

(See Section 3 of this TER for Legend) FCV 3 - 3.3

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

Not stated, Not applicable

FCV3-100

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Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e , 5f, 5g, 5h, 5 i, 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. 519/526

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SUMM	ARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X	The Licensee (has/has not) provided a response to the SER concerns.
	The Licensee (has/bas 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 1 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.
	SNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW
- CII	RCLED ITEM ONLY: (See Section 3 of this TER for Legend)
I.b	Qualified II.c Qualified Life Deficiency III.a Exempt
	Qualification Not Established III.b Not in Scope Not Qualified IV Documentation Not Available

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NRC REQ	UIREMENTS	SESIGNATION: X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	1-1-2 -
	e Similarity Between Equipment and Test Specimen Establ	ished X X X
Aging D	egradation Evaluated Adequately	- -
Qualifi	ed Life or Replacement Schedule Established (If Require	(a)
Program	Established to Identify Aging Degradation	-
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	- \frac{\sqrt{\x}}
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies Any) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	THE PROPERTY.
	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified	
1.5	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	Life
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	w
IV	Documentation Not Made Available	

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FRC Task No. __5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

LICENSEE RESPONSE TO NRC SER

Limitorque Model SMB-4

- a. The valve motor operator is qualified by test as described in Limitorque report F-C3271.
- b. The test objective was to qualify the actuators for service in a steam environment. The test consisted of a 12-hour exposure to an environment of saturated vapor, beginning with the introduction of steam and a temperature rise to about 212°F, followed after 6 hours by a temperature drop to about 155°F. The pressure was maintained at 7 inches water gage throughout the test. The performance of the actuator was monitored by cycling under load and measurement of insulation resistance on all power and control leads periodically during the test.
- c. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results, in our judgment, more than satisfy this requirement.
- d. The operating conditions to which these motor operators will be subjected to are within tested parameters with the exception of temperature and pressure. However, similar Limitorque actuators have been tested and qualified to substantially higher temperature and pressure (refer to Limitorque report 8-0027).
- e. Aging-Limitorque states in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.

Prepared by:

Reviewed by:

20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000

NOTES:		"X" DENOTES APPROPRIATE NOTES
XXXX	1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX	2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
XXXX	3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
XXXX	4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
XXXX	5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
XXXX	6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
XXXX	7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX	8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
XXXX	9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B,
-	10.	The Licensee has stated that the only harsh parameter page 5g) that this motorized valve actuator is exposed to is radiation.
	11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
	12.	The Licensee has committed to replace this equipment item.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

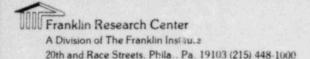
NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the the mal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

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FRC Task No. S19/526

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	onstructed of a phenolic material which would not experience signifi
d	egradation due to thermal effects. However, the motor lead insulati
ma	aterial is usually an organic compound and will suffer thermal degra
aı	tion. The licensee should address this component, as well as any
mo	otor-brake assemblies which may be installed, for both thermal aging
ar	nd radiation qualification. The licensee should be aware that Teflor
ha	as been used in this application (i.e. motor lead insulation) in some
CE	ises.
0 -	n 1 · 1 + 1 (n + m · 1.
<u>C.</u>	The licensee has noted that The sperificis
	emperatuse and pressure exceed The
(and lified temperature and pressure. The
6	licinose also notes That BOODF Lostu
a	similar actuator to higher timpusture.
a	nd pressures Than The accident condition
×	lowever similarity to either report has in
1	pein established.
~	ere brancisches.
-	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT 1TEM NO. 17

MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT

LIMITORQUE MODEL SMB; SIZE 000
REQUIRED OPERATING TIME: 5 DAYS

TER CHECKSHEET NO. 17

LICENSEE REFERENCE(S): 706, 2876

FUNCTION (PLANT ID): RCP THERMAL BARRIER (FCV 70-87)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-015 (TABLE 3.11-4/6)

FUNCTION (PLANT ID): RCP ALL COOLER (FCV 70-89)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-015 (TABLE 3.11-4/6)

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

R, T, Q1, RT, PH SA S, (R), M, I, M, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

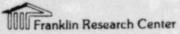
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SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provided a response to the SER concerns.
The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
X The Licensee has presented information which shows there are no outstanding qualification deficiencies.
The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
Corrective action specified by the Licensee:
Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source
Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress
Other ()
The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action)
The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)
I.a Qualified II.c Qualified Life Deficiency I.b Modification III.a Exempt
II.b Not Qualified III.b Not in Scope IV Documentation Not Available



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Documentation Not Made Available

IV

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. __519 ! 526___

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Paration 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 Equipment Qualification Not Established II.a Equipment Not Qualified II.D Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b

LICENSEE RESPONSE TO NRC SER

- a. The valve motor operator is qualified by test as described in Limitorque report 600456.
- b. The test objective was to qualify valve actuators to the type test specified by IEEE Std. 382'-72' for service in a PWR containment chamber.
- c. The testing sequence was as follows:
 - 1. Thermal aging 180°C for 100 hours.
 - 2. Mechanical aging 1208 Cycles.
 - 3. Radiation 2 by 108 rads.
 - 4. Seismic
 - 5. Environmental See Sheet 2.
- d. Operating time No qualification testing has been conducted in this specific area. However, substantial aging tests have been conducted and the results, in our judgment, more than satisfy this requirement.
- e. Note that only temperature and pressure of the accident environment in which the actuators must operate, exceed the qualification of the subject Limitorque report. However, these actuators have been tested and qualified to substantially higher temperatures and pressures (refer to Limitorque Report 8-0027).
- f. Aging-Limitorque states in their report that no detrimental effects were identified as a result of the testing sequence described above and, therefore, is qualified for a 40-year life.
- g. The subject test subjected the operator to a chemical spray mixture per Table 1 of IEEE 382 page 12.
- h. Humidity The test chamber humidity was maintained at 100 percent throughout the test.

Prepared by:

Reviewed by:

RJP12

NOTES:	"X" DENOTES APPROPRIATE NOTES
<u>XXXX</u> 1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
<u>xxxx</u> 2.	경기보고 있는 것이 없는 것이다. 그렇게 없는 것이 없는 것이 없는 것이 없는 것이다.
<u>xxxx</u> 3.	
<u>XXXX</u> 4.	
<u>XXXX</u> 5.	보는 그 사이 사이를 가는 것이 하는 것이 하는 것이 되었다면 살으면 하는 것이 되었다면 하는 것이 없는 것이 없는 것이 없는 것이 없는 것이 없는 것이 없는 것이다면 없다면 없다면 없다면 없다면 다른 것이다면 없다면 없다면 없다면 없다면 없다면 없다면 없다면 없다면 없다면 없
<u>XXXX</u> 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>XXXX</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX 8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>XXXX</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B,
10.	
11.	
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

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NOTES:	Both the limit switch and the torque switch in these devices are usual!
	constructed of a phenolic material which would not experience significant
	degradation due to thermal effects. However, the motor lead insulation
	material is usually an organic compound and will suffer thermal degrad-
	ation. The licensee should address this component, as well as any
	notor-brake assemblies which may be installed, for both thermal aging
	and radiation qualification. The licensee should be aware that Teflon
1	has been used in this application (i.e. motor lead insulation) in some
(eases.
C. 9	he dicenses has noted That The specified lemperature and pressure exceed The
ζ.	lempunture and messure except The
4	rualified Imminiture and principe. The
11	winner also meter That Bood Fintel
0	and promune Transton to higher turner tures
	Lowener similarity to either report has
	art her cotablished.
_/	and office confidence.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

EQUIPMENT ITEM NO. 18

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, INDIVIDUALLY COOLED ROOMS

LIMITORQUE MODEL SMB; SIZES 00, 0, 1, 2, 3

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 18

LICENSEE REFERENCE(S): 662

FUNCTION (F ANT ID): CHARGING PUMP FLOW TO RWST (LCV 62-135, -136)

LICENSEE SUBMITTAL: SCEW(S): (TABLE 3.11-7/11)

FUNCTION (PLANT ID): RHR PUMP (A-A, B-B) INLET FLOW CONTROL VALVE (FCV 74-3,

-21)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/11; TABLE 3.11-8/10; TABLE

3.11-7-2/3; TABLE 3.11-8-2/2

FUNCTION (PLANT ID): SIS PUMP (A-A, B-B TO RWST ISOLATION VALVE (FCV 63-4,

-175)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/11; TABLE 3.11-7-2/3;

TABLE 3.11-8-2/2

FUNCTION (PLANT ID): SIS PUMP (A-A, B-B) INLET VALVE (FCV 63-47, -48)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/11

FUNCTION (PLANT ID): CONTAINMENT SUMP FLOW ISOLATION VALVE (FCV 63-72, -73)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/11

FUNCTION (PLANT ID): SEAL FLOW ISOLATION VALVE (FCV 62-63) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/6; TABLE 3.11-8/32

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, &, S, (R), M, I, QM, RPN, EXN, SEN, QI, RFS, None,

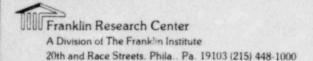
* SEE PAGE 3a FOR SER DESICIENCIES
Not stated, Not applicable

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Maintenance and Replacement Schedule Summary



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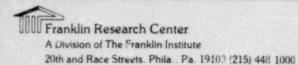
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

EQUIPMENT ITEM NO. 18 (CONTINUED) FUNCTION (PLANT ID): SES PUMP (A-A, B-B) FLOW MOV (FCV 63-152) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/8; TABLE 3.11-8/32 FUNCTION (PLANT ID): TO RCS COLD LEGS MOV (FCV 63-153) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/8; TABLE 3.11-8/32 FUNCTION (PLANT ID): SIS PUMP (A-A, B-B) FLOW MOV (FOV 63-156) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/8; TABLE 3.11-8/35 FUNCTION (PLANT ID): TO RCS NOT LEGS MOV (FCV 63-157) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/8; TABLE 3.11-8/35; TABLE 3.11-7-2/3; TABLE 3.11-8-2/2 FUNCTION (PLANT ID): CHARGING PUMP MINI-FLOW (FCV 62-98, -99) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/8; TABLE 3.11-8/8 FUNCTION (PLANT ID): CHARGING FLOW ISOLATION VALVES (FCV 62-90, -91) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/9; TABLE 3.11-8/23 FUNCTION (PLANT ID): RHR PUMP (A-A, B-B) DISCHARGE TO COLD LEGS 1, 2, 3, 4 MOV (FCV 63-93, -94) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/9; TABLE 3.11-8/8 FUNCTION (PLANT ID): SIS PUMP COLD LEG INJECTION VALVE (FCV 63-22) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/9; TABLE 3.11-8/33 FUNCTION (PLANT ID): SIS BORON INJECTION TANK ISOLATION VALVE (FCV 63-25, -26) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/9; TABLE 3.11-8/33 FUNCTION (PLANT ID): SIS BORON INJECTION INLET ISOLATION VALVE (FCV 63-39, -40) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/9; TABLE 3.11-8/33 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, E, 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. 18

EQUIPMENT ITEM NO. 18 (CONTINUED)

FUNCTION (PLANT ID): RWST TO BHP PUMP FLOW CONTROL VALVE (FCV 63-1)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9

FUNCTION (PLANT ID): SIS PUMP DISCHARGE TO RWST SHUTOFF VALVE (FCV 63-3)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9

FUNCTION (PLANT ID): RWST TO SIS PUMP FLOW CONTROL VALVE (FCV 63-5)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9

FUNCTION (PLANT ID): SIS PUMP INLET TO CVCS CHARGING PUMP (FCV 63-6, -7)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9

FUNCTION (PLANT ID): RHR HEAT EXCHANGER TO CVCS CHARGING PUMP (FCV 63-8)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9

FUNCTION (PLANT ID): RHR HEAT EXCHANGER TO SIS PUMP (FCV 63-11)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9

FUNCTION (PLANT ID): RHR PUMP (A-A, B-B) MINI-FLOW VALVE (FCV 74-12, -24)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/34

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specification who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
X The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
X Justification for interim open Licensee for this equipment it	ration (has/has not) been provided by the tem.
X Corrective action specified by	the Licensee:
Equipment replacement with Liquipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e X Other (AWAITING Docu	e submergence level ent from radiation source dditional (testing/analysis) mild environment
The Licensee has provided other that can be construed as a base operation.	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	ment item does not require qualification rironmental qualification.
DESIGNATION OF RESULT OF NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON REVIEW
The section 3 o	t cars tak for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope IV Documentation Not Available

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	<u>RM</u>
		DESIGNATION: X = DEFICIENCY
NRC REQ	UIREMENTS	A - DELIGIBIOS
Adequat Aging D Qualifi	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Estable egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Required	
Criteri	Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Pequired) a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
0	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
Criteri	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
Critari	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
Il.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified or Replacement Schedule Justified	Life
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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01. + +7.#	SER DEFICIENCIES
Plant ID#	
LCV 62-135,-136	R,T,QT,P,H,A,M,QM
FCV 74-3	R,T, QT, P, H, A, M, QM, QT (UNIT 2
FC V 74 -21	QT, A, M
FCV 63 -4	QT, A,M
FCV 63-175	QT, T, P, H, A, R, M, QM, QI (UNIT &
FCV 63-47,-48	QT, A, M
F(V 63-72, -73	QT, A, M
FCV 62-63	QT, T, P,H, A, R, M, QM, QT
FCV 63-152	QT, A, M
FCV 63-153	QT, A, M
FCV 63-156	R,T, QT, P, H, A, M, QM, QI
FCV 63 -157	R.T. QT. P. H.A.M. QM, QI
FCV 62 -98, -99	R,T, QT, P, H, A,M, QM, QI
FCV 62 - 90, -91	QT, A,M
FCU 63-93, -94	QT, A,M
FCV 63 - 22	QT, A,M
FCV 63-25, -26	QT, A,M
FCV 63 - 39, -40	QT, A,M
FCV 63-1	QT, A,M
FCV 63-3	QT, A, M
FCV 63-5	QT, A,M
FCV 63-6,-7	QT, A, M
FCV 63-8	QT, A,M
CV 63-11	QT, A, M
CU 74-12,-24	R. T. QT, P. H, A, M, QM, QI

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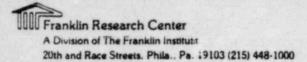
NOTES:		"X" DENOTES APPROPRIATE NOTES
XXXX	1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX	2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
XXXX	3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
XX	4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
XXXX	5.	HE 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
XXXX	6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
XXXX	7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX	8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
XXXX	9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B
	10.	The Licensee has stated that the only harsh parameter page 5g) that this motorized valve actuator is exposed to is radiation.
	11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
1	12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

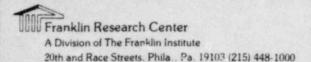
NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.



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NOTES:
Both the limit switch and the torque switch in these devices are usuall
constructed of a phenolic material which would not experience signification
degradation due to thermal effects. However, the motor lead insulation
material is usually an organic compound and will suffer thermal degrad-
ation. The licensee should address this component, as well as any
motor-brake assemblies which may be installed, for both thermal aging
and radiation qualification. The licensee should be aware that Teflon
has been used in this application (i.e. motor lead insulation) in some
cases.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

EQUIPMENT ITEM NO. 19

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING

LIMOTORQUE MODEL SM3; SIZES 00, 1, 2

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 19

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): VCT ISOLATION VLAVE (LCV 62-152, -153)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-8/11

FUNCTION (PLANT ID): RHR HEAT EXCHANGER (A, B) BYPASS MOV (FCV 74-33, -35)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-8/5; TABLE 3.11-6/15 FUNCTION (PLANT ID): VCT ISOLATION VALVES (LCV 62-132, -133)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-6/22

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

(See Section 3 of this TER for Legend) FCV 74 - 33 - 35

ROT Stated Not septicable (R), (R), (M), I, (M), RPN, EXN, SEN, (QI) RPS, None,

Not stated Not applicable

LCV 62-152, -153

LISTING OF APPLICABLE CHECKSHEETS:

Contents Checksheet Page No.

Equipment Item

Summary of Licensee Responses to the NRC SER 15

Equipment Environmental Qualification Summary Forms 2

Licensee Response to NRC SER

System Consideration Review 4a. 4b, 4c, 4d, 4s, 4f

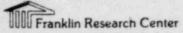
Installed TMI Lessons Learned Implementation 6a, 6b

Equipment Summary

Maintenance and Replacement Schedule Summary 72, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	cally stated that the equipment is an exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not has	ed a corrective action for this equipment seen fully established.
X Justification for interim oper Licensee for this equipment it	action (has/has not) been provided by the em.
X Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification Equipment relocation above	
Relocate or shield equipme Verify qualification by ad Equipment relocation to a	ditional (testing/analysis)
Qualification testing of e X Other (ΑΥΝΑΠΙΝΕ DOCUM	
	r information for this equipment item is for justification for interim
	for accomplishing the corrective
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualification ironmental qualification.
	TION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 o	f this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification II.a Qualification Not Established	III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available
	The state of the s



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una pr	NIT DEMPANCE	DESIGNATION: X = DEFICIENCY
NRC REC	QUIREMENTS	
Documen	nted Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establis	shed X X X
ging I	Degradation Evaluated Adequately	_X_
ualif	led Life or Replacement Schedule Established (If Required) <u>X</u>
rogran	Established to Identify Aging Degradation	
riter	a Regarding Aging Simulation Satisfied (If Required)	
criteri	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
0	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	la Regarding Spray Satisfied	
	ia Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criter	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	a Regarding Functional Testing Satisfied	
Criter	la Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
VEC OU	ALIFICATION CATEGORY	X = CATEGORY
i.a	Equipment Qualified	
d.b	Equipment Qualification Pending Modification	-
I.a	Equipment Qualification Not Established	
I.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified L	ife
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
111.0		
III.b	Equipment Not in the Scope of the Qualification Review Documentation Not Made Available	

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519 | 57.6

NOTES:	"X" DENOTES APPROPRIATE NOTES
<u>XXXX</u> 1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
<u>xxxx</u> 2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
<u>XXXX</u> 3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
<u>XXXX</u> 4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
<u>XXXX</u> 5.	The Licensee has not identified the motor manufacturer for this motorized walve actuator.
XXXX 6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
<u>XXXX</u> 7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX 8	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>XXXX</u> 9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B
10.	The Licensee has stated that the only harsh parameter page 5g) that this motorized valve actuator is exposed to is radiation.
11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

NOTES:

- A. The licensee has not established similarity between the installed

 equipment and the test specimen used in the referenced report(s). The

 licensee has not provided a letter from the manufacturer which would

 establish similarity via their records, nor have they sufficiently

 described the installed equipment enough to allow similarity to be

 established by other means (see page 5f). The licensee has not provided

 the serial number for the actuator or motor, nor have they provided

 the manufacturer's order number. This information would be necessary

 to establish similarity through the manufacturers records. In addition

 to those items identified on page 5f, the licensee should also identify

 the motor lead insulation material, the gear frame housing material,

 the type of limit switch and the type of torque switch (inside or outside

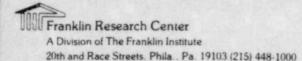
 containment). The licensee should be aware that Teflon has been used for

 motor lead insulation material in some cases.
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

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degradation due to thermal effects. However, the motor lead insulation material is usually an organic compound and will suffer thermal degradation. The licensee should address this component, as well as any motor-brake assemblies which may be installed, for both thermal aging and radiation qualification. The licensee should be aware that Teflon	NOTES:	Both the limit switch and the torque switch in these devices are usually
material is usually an organic compound and will suffer thermal degradation. The licensee should address this component, as well as any motor-brake assemblies which may be installed, for both thermal aging and radiation qualification. The licensee should be aware that Teflon has been used in this application (i.e. motor lead insulation) in some		constructed of a phenolic material which would not experience significant
ation. The licensee should address this component, as well as any motor-brake assemblies which may be installed, for both thermal aging and radiation qualification. The licensee should be aware that Teflon has been used in this application (i.e. motor lead insulation) in some		degradation due to thermal effects. However, the motor lead insulation
motor-brake assemblies which may be installed, for both thermal aging and radiation qualification. The licensee should be aware that Teflon has been used in this application (i.e. motor lead insulation) in some		material is usually an organic compound and will suffer thermal degrad-
and radiation qualification. The licensee should be aware that Teflon has been used in this application (i.e. motor lead insulation) in some		ation. The licensee should address this component, as well as any
and radiation qualification. The licensee should be aware that Teflon has been used in this application (i.e. motor lead insulation) in some		motor-brake assemblies which may be installed, for both thermal aging
		and radiation qualification. The licensee should be aware that Teflon
cases.		has been used in this application (i.e. motor lead insulation) in some
		cases.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT ITEM NO. 20

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (GENERAL SPACES)

LIMOTORQUE MODEL SMB; SIZE 00

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 20

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): ISOLATION VALVE FLOW CONTROL (FCV 87-21, -24)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-6/29

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend) FCV 87-24

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

Not stated, Not applicable FLV 87-21 (NEW ITEM)

LISTING OF APPLICABLE CHECKSHEETS:

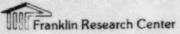
Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 40, 4d, 40, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5a, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b -

7a, 7b, 7c

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SUM	UMMARY OF LICENSEE RESPONSES TO THE NRC 3	ER - ONLY CHECKED ITEMS ARE APPLICABLE
X	The Licensee (has/has not) provided a	response to the SER concerns.
_	The Licensee (has/has not) specificall qualified and/or will function when ex environmental service conditions.	
_	The Licensee has presented information outstanding qualification deficiencies	
X	The Licensee (has has not been item whose qualification has not been	
	X Justification for interim operation Licensee for this equipment item.	n (has/has not) been provided by the
	X Corrective action specified by the	Licensee:
	Equipment replacement with qua	lified equipment
	Equipment relocation above sub-	mergence level
	Relocate or shield equipment f Verify qualification by addition	rom radiation source
	Verify qualification by additi-	onal (testing/analysis)
	Equipment relocation to a mild	environment
	Qualification testing of equip	
	X Other (AWAITING DOCUMEN	
	The Licensee has provided other in that can be construed as a basis for operation.	
	X The Licensee (has/has not) provide corrective action. (Schedule for action	d a schedule for the proposed accomplishing the corrective
_	_ The Licensee states that the equipment	
	and/or should be exempted from environ	mental qualification.
DES	SIGNATION OF RESULTANT NRC QUALIFICATION	EVALUATION CATEGORY SASED ON REVIEW
	CIRCLED ITEM ONLY: (See Section 3 of th	
1.a	a Qualified II	c Qualified Life Deficiency
		I.a Exempt
		I.b Not in Scope
-	I.b Not Qualified IV	



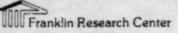
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

POULDMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

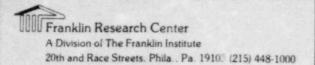
NRC REC	UIREMENTS	DESIGNATION: X = DEFICIENCY
Documen	nted Evidence of Qualification Adequate	shed X
Adequa	e Similarity Between Equipment and Test Specimen Establi	shed
Aging !	Degradation Evaluated Adequately	
Qualif	ed Life or Replacement Schedule Established (If Required)
Program	Established to Identify Aging Degradation	
Criter	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	=
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criter	la Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
Criter	a Regarding Functional Testing Satisfied	
Criter	la Regarding Instrument Accuracy Satisfied	
Test D	ration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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 L	ife
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
d.III	Equipment Not in the Scope of the Qualification Review	
	Documentation Not Made Available	



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NOTES:
1. The licensee has not cited any qualification
documentation from The manufactioner
for This equipment item. When documentation
is collected. The licensee should make
note of The other considerations noted on
The Breviously reviewed Timitorque Matorined
Velue actuators.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2/

EQUIPMENT ITEM NO. 21

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (GENERAL SPACES)

LIMOTORQUE MODEL SMB; SIZE 00

REQUIRED OPERATING TIME: 2 MONTHS

TER CHECKSHEET NO. 21

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): ISOLATION VALVE FLOW CONTROL (FCV 87-22, -23)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-6/29

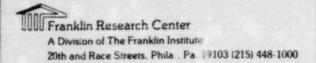
DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)

R.T. QT RT, PH CS, A S, (R), M, I, QM RPN, EXN, SEN, QT RPS, None, Not stated, Not applicable FCV 87-23

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 7a

SUMMARY OF LICENSFE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provided a response to the SER concerns.
The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
The Licensee has presented information which shows there are no outstanding qualification deficiencies.
X The Licensee (has has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
X Corrective action specified by the Licensee:
Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress X Other (AWAITING DOCUMENTATION FROM VENDOR) The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation. X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action)
The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)
I.a Qualified 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



FRC Project No. C5257
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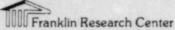
Page 2

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
NRC REC		ESIGNATION: = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	_X_
Adequat	e Similarity Between Equipment and Test Specimen Establish	ied X
Aging D	egradation Evaluated Adequately	
Oualifi	ed Life or Replacement Schedule Established (If Required)	
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
0	Peak Pressure Adequate	
0	Duration Adequate	=
0	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
Criteri	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
(If A	ny) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	=
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
	TARTON CAMECORY	DESIGNATION: X = CATEGORY
NRC QUA	LIFICATION CATEGORY	
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
	Equipment Not Qualified	
II.b		
II.c	Equipment Satisfies All Requirements Except Qualified Life	fe
	Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified	te
	Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified Equipment Exempt From Qualification	fe
II.c	Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified	fe

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519 1526

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NOTES:
1. The licensee has not cited any qualification
documentation from The manufacturer for
This equipment item. When documentation
· · · · · · · · · · · · · · · · · · ·
is made available, The licensee should
make note of the other considerations
highlighted on The previously reviewed
make note of The other considerations highlighted on The previously reviewed Limitorque Motorined Value actuators.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ITEM NO. 22

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, INDIVIDUALLY COOLED ROOMS

LIMOTORQUE MODEL SMB; SIZE 00

REQUIRED OPERATING TIME: 1 MONTH

TER CHECKSHEET NO. 22

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): EMERGENCY BORATION FLOW CONTROL VALVE (FCV 62-138)

LICENSEF SUBMITTAL: SCEW(S): TABLE 3.11-7/11; TABLE 3.11-8/7

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









R.T. PH CS, A S, (R), M, I, QM RPN, EXN, SEN, QI RPS, None,



Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

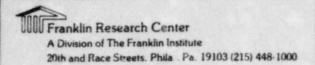
Contents Checksheet Page No. Equipment Item la Summary of Licensee Responses to the NRC SER 16 Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER 3a, 3b, 3c, 3d System Consideration Review 4a, 4b, 4a, 4d, 4e, 4£ Equipment Environmental Qualification Review 5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j Installed TMI Lessons Learned Implementation 6a, 6b Equipment Summary

Maintenance and Replacement Schedule Summary

7a, 7b, 7c

Page

SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	cally stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
X The Licensee (her has - propose item whose qualification has not be	ed a corrective action for this equipment seen fully established.
X Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided by the em.
X Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipme	
	ditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e	
	MENTATION FROM VENDOR
	r information for this equipment item is for justification for interim
	vided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	ment item does not require qualification ironmental qualification.
DESTANATION OF DESTANDAND MAS OUT THE	TON PURIOUS ALTERNATION AND ADDRESS AND AD
- CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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		ESIGNATION:
NRC RE	QUIREMENTS	= DEFICIENCY
Docume	nted Evidence of Qualification Adequate	
	e Similarity Between Equipment and Test Specimen Establish	aled X X X
Aging	Degradation Evaluated Adequately	_ <u>X</u> _
Qualif	led Life or Replacement Schedule Established (If Required)	
Program	Established to Identify Aging Degradation	
Criter	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	-
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	-
	Steam Exposure (If Required) Adequate	
	la Regarding Spray Satisfied	
	ia Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criter	la Regarding Test Sequence Satisfied	
	la Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	a Regarding Functional Testing Satisfied	
Criter	la Regarding Instrument Accuracy Satisfied	
Test D	ration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	-
		DESIGNATION
NRC QUA	ALIFICATION CATEGORY	X = CATEGOR
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	e
	or Replacement Schedule Justified	
	Equipment Exempt From Qualification	
III.a III.b	Equipment Not in the Scope of the Qualification Review Documentation Not Made Available	

NOTES:		"X" DENOTES APPROPRIATE NOTES
xxxx	1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX	2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
XXXX	3.	
XXXX	4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
XXXX	5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
XXXX	6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
XXXX	7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX	8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
XXXX	9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B
_	10.	The Licensee has stated that the only harsh parameter page 5g) that this motorized valve actuator is exposed to is radiation.
	11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
	12.	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

Page 5h

NOTES:	Both the limit switch and the torque switch in these devices are usually
	constructed of a phenolic material which would not experience significan
	degradation due to thermal effects. However, the motor lead insulation
	material is usually an organic compound and will suffer thermal degrad-
	ation. The licensee should address this component, as well as any
	motor-brake assemblies which may be installed, for both thermal aging
	and radiation qualification. The licensee should be aware that Teflon
	has been used in this application (i.e. motor lead insulation) in some
	cases.
c.	The breensee has stated that This This
	equipment item lacks qualification
	, //
	qualification report.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ITEM NO. 23

MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT (LOWER)

LIMOTORQUE MODEL SMB; SIZES 00, 2, 3

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 23

LICENSEE REFERENCE(S): 637, 639, 721

FUNCTION (PLANT ID): SEAL FLOW ISOLATION VALVE (FCV 62-61)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-4/12

FUNCTION (PLANT ID): SIS ACCUMULATOR TANK FLOW ISOLATION VALVE (FCV 63-67,

-80, -98, -118)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-4/12

FUNCTION (PLANT ID): RHR INJECTION OR RECIRCULATION AFTER LOCA VALVE (FCV

63-172)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-4/12; TABLE 3.11-4-2/1

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:

Contents	Checksheet Page No.	
Equipment Item	la	
Summary of Licensee Responses to the NRC SER	1b	
Equipment Environmental Qualification Summary Forms	2	
Licensee Response to NRC SER	3 4, 35, 3c, 3d	
System Consideration Review	4a, 4b, 40, 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	70, 7b, 7c	

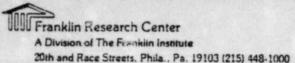
Page

SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	cally stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
X The Licensee (had has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
X Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided by the tem.
X Corrective action specified by	the Licensee:
	e submergence level ent from radiation source dditional (testing/analysis) mild environment equipment in progress ementation FROM VENDOR)
that can be construed as a bas operation.	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equip	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW 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 SUMMARY FORM			
		DESIGNATION:	
NRC REC	QUIREMENTS	X = DEFICIENCY	
ocumen	nted Evidence of Qualification Adequate		
dequat	te Similarity Between Equipment and Test Specimen Establi	shed X	
ging D	Degradation Evaluated Adequately		
	ied Life or Replacement Schedule Established (If Required) <u>X</u>	
rogram	Established to Identify Aging Degradation)	
	ia Regarding Aging Simulation Satisfied (If Required)		
	la Regarding Temperature/Pressure Exposure:		
	Peak Temperature Adequate		
	Peak Pressure Adequate		
	Duration Adequate	\equiv	
	Required Profile Enveloped Adequately		
	Steam Exposure (If Required) Adequate		
	ia Regarding Spray Satisfied		
	ia Regarding Submergence Satisfied		
	ia Regarding Radiation Satisfied	\equiv	
	ia Regarding Test Sequence Satisfied ia Regarding Test Failures or Severe Anomalies		
	Any) Satisfied		
	ia Regarding Functional Testing Satisfied		
	ia Regarding Instrument Accuracy Satisfied		
Test Di	uration Margin (1 hour + Function Time) Satisfied		
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)		
		DESIGNATION:	
IRC QUA	ALIFICATION CATEGORY	X = CATEGORY	
.a	Equipment Qualified		
.b	Equipment Qualification Pending Modification		
I.a	Equipment Qualification Not Established	_ <u>×</u>	
I.b	Equipment Not Qualified	<u>×</u>	
I.c	Equipment Satisfies All Requirements Except Qualified I	ite	
	or Replacement Schedule Justified		
II.a	Equipment Exempt From Qualification		
d.II	Equipment Not in the Scope of the Qualification Review		
TV V	Documentation Not Made Available		



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FRC Assignment No. 13

FRC Task No. 519 | 576

NOTES:	"X" DENOTES APPROPRIATE NOTES
XXXX 1	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX 2	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
XXXX 3	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
XXXX 4	. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
XXXX 5	 The Licensee has not identified the motor manufacturer for this motorized valve actuator.
XXXX 6	. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
XXXX 7	. The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX 8	. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
<u>XXXX</u> 9	. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B
10	
11	
12	The Licensee has committed to replace this equipment item. The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

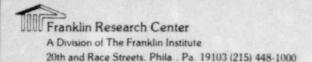
NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

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FRC Task No. S19/526

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NOTES: Both the limit switch and the torque switch in these devices are usuall
constructed of a phenolic material which would not experience significa
degradation due to thermal effects. However, the motor lead insulation
material is usually an organic compound and will suffer thermal degrad-
ation. The licensee should address this component, as well as any
motor-brake assemblies which may be installed, for both thermal aging
and radiation qualification. The licensee should be aware that Teflon
has been used in this application (i.e. motor lead insulation) in some
cases.
C. The licensue has stated that This
equipment item backs qualification a
qualification reports)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

EQUIPMENT ITEM NO. 24

MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT

LIMOTORQUE MODEL SMB; SIZE 1
REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 24

LICENSEE REFERENCE(S): 637, 639, 721

FUNCTION (PLANT ID): RHR ISOLATION VALVE A AND B TRAIN (FCV 74-1, -2)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-4/18

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

RT RT, PB SA, 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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3o, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 6i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7a

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SUMMARY	OF LICENSEE RESPONSES TO THE M	NRC SER	- ONLY CHECKED ITEMS ARE APPLICABLE
X The	Licensee (has/has not) provide	ed a res	sponse to the SER concerns.
qual	Licensee (has/has not) specification who ironmental service conditions.		
	Licensee has presented information deficient		nich shows there are no
X The	Licensee (had has not) propose whose qualification has not b	ed a cor een ful	rective action for this equipment ly established.
X	Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided by the
X	Corrective action specified by	the Li	censee:
	Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a	submer ent from	gence level radiation source
	Qualification testing of e	quipmen	t in progress
	The Licensee has provided other that can be construed as a bas operation.		mation for this equipment item justification for interim
X	The Licensee (has/has not) procorrective action. (Schedule action		
	Licensee states that the equip or should be exempted from env		em does not require qualification
DESIGNAT		TION EV	ALUATION CATEGORY BASED ON REVIEW
T	lified		Out 1464-2 746- D. C.
I.a Qua	ification		Qualified Life Deficiency Exempt
	lification Not Established		Not in Scope
NAME AND ADDRESS OF THE OWNER, WHEN	Qualified	IV	Documentation Not Available
			and the stationic

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	M
		DESIGNATION:
NRC REC	UIREMENTS	X = DEFICIENCY
Ocumer	ated Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establi	shed X
ging I	Degradation Evaluated Adequately	_X_
ualif	ed Life or Replacement Schedule Established (If Required	shed X X X
rogran	Established to Identify Aging Degradation	
riter	a Regarding Aging Simulation Satisfied (If Required)	
riteri	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
0	Peak Pressure Adequate	
	Duration Adequate	
0	Required Profile Enveloped Adequately	_
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	-
riter	a Regarding Submergence Satisfied	-
riter	a Regarding Radiation Satisfied	
riter	a Regarding Test Sequence Setisfied	
riter	a Regarding Test Failures or Severe Anomalies	
(If a	Any) Satisfied	
riteri	a Regarding Functional Testing Satisfied	
riter	a Regarding Instrument Accuracy Satisfied	=
est Du	ration Margin (1 hour + Function Time) Satisfied	
criter	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
IDC OIL	ALIFICATION CATEGORY	X = CATEGORY
IRC QUA	ALIFICATION CATEGORI	
.a	Equipment Qualified	-
.b	Equipment Qualification Pending Modification	
I.a	Equipment Qualification Not Established	X
I.b	Equipment Not Qualified	A Section
I.c	Equipment Satisfies Aal Requirements Except Qualified I	ife
	or Replacement Schedule Justified	
II.a	Equipment Exempt From Qualification	-
III.a	Equipment Not in the Scope of the Qualification Review	-

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

NOTES:		"X" DENOTES APPROPRIATE NOTES
XXXX	1.	The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX	2.	The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
XXXX	3.	The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
XXXX	4.	The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
XXXX	5.	The Licensee has not identified the motor manufacturer for this motorized valve actuator.
XXXX	6.	The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
XXXX	7.	The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX	8.	The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
XXXX	9.	The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note limited in the second seco
-	10.	The Licensee has stated that the only harsh parameter page 5g that this motorized valve actuator is exposed to is radiation.
	11.	Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose ofis considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
	12.	The Licensee has committed to replace this equipment item.

The Licensee has stated the following:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

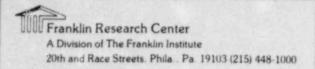
NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
- B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

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FRC Task No. S19 / S26

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	constructed of a phenolic material which would not experience signification
	degradation due to thermal effects. However, the motor lead insulation
	material is usually an organic compound and will suffer thermal degrad-
	ation. The licensee should address this component, as well as any
	motor-brake assemblies which may be installed, for both thermal aging
	and radiation qualification. The licensee should be aware that Teflon
	has been used in this application (i.e. motor lead insulation) in some
	cases.
C.	The licensee has stated That This equip
	qualification reports).
0	equipment is subminged, but has
	provided no qualification for This
	sarameter.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

EQUIPMENT ITEM NO. 25

MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT

LIMOTORQUE MODEL SMB; SIZE 00 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 25

LICENSEE REFERENCE(S): 637, 639, 721

FUNCTION (PLANT ID): RCS PRESSURIZER RELIEF VALVE (FCV 68-332, -333)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-4/18

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

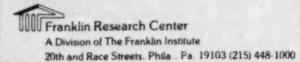
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	32, 3b, 30, 3d
System Consideration Review	4a, 4b, 40, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5e, 5d, 5e , 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b-
Maintenance and Replacement Schedule Summary	7 a, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
X Justification for interim oper Licensee for this equipment is	ration (has/has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above	
Relocate or shield equipme Verify qualification by a	ent from radiation source dditional (testing/analysis)
Equipment relocation to a Qualification testing of a X Other (Awarna Day	
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
	pment item does not require qualification
and/or should be exempted from env	
- CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	M
NRC REG	QUIREMENTS	DESIGNATION: X = DEFICIENCY
Documer Adequate Aging I Qualific Program Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri	nted Evidence of Qualification Adequate te Similarity Between Equipment and Test Specimen Establic Degradation Evaluated Adequately Led Life or Replacement Schedule Established (If Required in Established to Identify Aging Degradation La Regarding Aging Simulation Satisfied (If Required) La Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate La Regarding Spray Satisfied La Regarding Radiation Satisfied La Regarding Test Sequence Satisfied La Regarding Test Failures or Severe Anomalies Any) Satisfied La Regarding Functional Testing Satisfied La Regarding Instrument Accuracy Satisfied La Regarding Instrument Accuracy Satisfied La Regarding Margins Satisfied (NUREG-0588, Cat. I)	
NRC QUA	ALIFICATION 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	160
II.c	Equipment Satisfies All Requirements Except Qualified I	ire
	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. 519 | 526

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NOTES:	"X" DENCTES APPROPRIATE NOTES
XXXX	 The Licensee has not provided documentation from the manufacturer which establishes similarity between the installed equipment and the test specimen in the referenced document(s). (Also see note A, page 5g)
XXXX	2. The Licensee has not identified the class of the insulation system used for the motor in the motorized valve actuator.
XXXX	3. The Licensee has not identified whether or not this motorized valve actuator incorporates a motor-brake assembly.
XXXX	4. The Licensee has not identified the class of the insulation system used for the motor-brake assembly (if applicable).
XXXX	 The Licensee has not identified the motor manufacturer for this motorized valve actuator.
XXXX	6. The Licensee has not identified the manufacturer of the motor-brake assembly (if applicable).
XXXX	7. The Licensee has not identified the type of current used in the motorized valve actuator.
XXXX	8. The Licensee has not identified the type of current used in the motor-brake assembly (if applicable).
XXXX	9. The Licensee has not established a qualified life estimate for this motorized valve actuator based on technically justifiable methods and conservative assumptions. (Also see note B,
1	.0. The Licensee has stated that the only harsh parameter page 5g) that this motorized valve actuator is exposed to is radiation.
1	I. Since radiation is stated to be the only harsh parameter and considering the extensive radiation testing of the motors used in this type of motorized valve actuator, the specified radiation dose of is considered to be of sufficiently low value as to not affect this equipment item. This equipment item is considered qualified for this parameter.
1	 The Licensee has committed to replace this equipment item. The Licensee has stated the following:

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

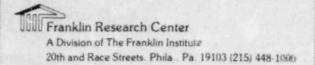
NOTES:

- A. The licensee has not established similarity between the installed equipment and the test specimen used in the referenced report(s). The licensee has not provided a letter from the manufacturer which would establish similarity via their records, nor have they sufficiently described the installed equipment enough to allow similarity to be established by other means (see page 5f). The licensee has not provided the serial number for the actuator or motor, nor have they provided the manufacturer's order number. This information would be necessary to establish similarity through the manufacturers records. In addition to those items identified on page 5f, the licensee should also identify the motor lead insulation material, the gear frame housing material, the type of limit switch and the type of torque switch (inside or outside containment). The licensee should be aware that Teflon has been used for motor lead insulation material in some cases.
 - B. The licensee has claimed a qualified life estimate of 40 years based on the testing performed in the referenced report(s). There was no basis for the aging times and temperatures chosen for the thermal aging that was performed. The licensee has provided no supporting analyses which established a conservative qualified life estimate for this equipment item. As the manufacturer has noted, the qualification of the seals, gaskets and lubricants is inconsequential due to the fact that these MVAs are not sealed units and do not depend on absolute sealing for continued operability. This does not mean that these components should not be replaced on a periodic basis as recommended by the manufacturer.

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	Both the limit switch and the torque switch in these devices are usually
	constructed of a phenolic material which would not experience significant
	degradation due to thermal effects. However, the motor lead insulation
	material is usually an organic compound and will suffer thermal degrad-
	ation. The licensee should address this component, as well as any
	motor-brake assemblies which may be installed, for both thermal aging
	and radiation qualification. The licensee should be aware that Teflon
	has been used in this application (i.e. motor lead insulation) in some
	cases.
~	The licensee has stated mat this
_	The successed was stated that this
	equipment item lacks qualification
-	documentation, but has referenced a
	qualification reports.
_	
_	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

EQUIPMENT ITEM NO. 26

ELECTRIC MOTOR, LOCATION NOT STATED

RELIANCE MODEL 3Y362208

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 26

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): EMERGENCY GAS TREATMENT FAN MOTOR

SERVICE: EMERGENCY GAS TREATMENT

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-3 (3.11-7, PAGE 7)

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

R,T,D B CS,A,S, (R),M, I, M, RPN, EXN, SEN, RPS, None, Not stated, Not applicable

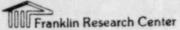
LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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

7a, 7b, 7c-

SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	d a response to the SER concerns.
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is an exposed to the applicable DBE
The Licensee has presented informa outstanding qualification deficien	
X The Licensee (has/hee not) propose item whose qualification has not b	d a corrective action for this equipment een fully established.
	ation (has/has not) been provided by the em.
X Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification Quipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (submergence level ent from radiation source ditional (testing/snalysis) mild environment
	er information for this equipment item is for justification for interim
	for accomplishing the corrective
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualification rironmental qualification.
	TION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 o	of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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FRC Task No. 5/9/526

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
		ESIGNATION:
NRC REC	UI REMENTS X	= DEFICIENCY
Documer	ted Evidence of Qualification Adequate	ed <u>X</u>
Adequat	e Similarity Between Equipment and Test Specimen Establish	ed
Aging I	egradation Evaluated Adequately	
qualifi	ed Life or Replacement Schedule Established (If Required)	
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
0	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	-
	a Regarding Spray Satisfied	
Criteri	a Regarding Submergence Satisfied	-
Criteri	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
(If A	ny) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Book D	ration Margin (1 hour + Function Time) Satisfied	
TERE DE	- Description Marriag Catiofied (NUDPC-0588 Cat I)	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	4
Criter	a Regarding Margins Sacisfied (North-1996), Cat. 17	DESIGNATION:
Criteri		
riter	LIFICATION CATEGORY	
NRC QUA	LIFICATION CATEGORY Equipment Qualified	X = CATEGORY
NRC QUA	LIFICATION CATEGORY Equipment Qualified Equipment Qualification Pending Modification	
NRC QUA	LIFICATION CATEGORY Equipment Qualified	X = CATEGORY
NRC QUA	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified	X = CATEGORY
NRC QUA	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established	X = CATEGORY
NRC QUA	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified	X = CATEGORY
NRC QUA	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life	X = CATEGORY
Criteri	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified	X = CATEGORY

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT ITEM NO. 27

ELECTRIC MOTOR LOCATED IN THE CONTAINMENT, LOWER COMPARTMENT

RELIANCE MCDEL X-328203

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 27

LICENSEE REFERENCE(S): 1559, 5884

FUNCTION (PLANT ID): CONTAINMENT AIR RETURN FAN MOIOR (30-1AAA, 30-1BBB)

SERVICE: CONTAINMENT AIR RETURN

LICENSEE SUBMITTAL: SCEW(S): (3.11-4 PAGE 8) NEB-ECS-1

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), (C3 (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	la
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	42, 4b, 4c, 4d, 4e, 45
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, 7e

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FRC Assignment No. 13,
FRC Task No. __5/9/5/26

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
∑ The Licensee (has/hee-sot) providence	ded a response to the SER concerns.
The Licensee (has/beanst) specific qualified and/or will function when the environmental service conditions.	men exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment in	eration (has/has not) been provided by the tem.
Corrective action specified b	by the Licensee:
Equipment replacement wit	
Equipment relocation abov	
	ment from radiation source
Equipment relocation by a	idditional (testing/analysis)
Qualification testing of	
Other ()
	er information for this equipment item asis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC	CATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

IV

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	DESIGNATION:
NRC REQ	UIREMENTS	X = DEFICIENCY
Adequate Aging D Qualifi Program Criteri	ted Evidence of Qualification Adequate te Similarity Between Equipment and Test Specimen Estable tegradation Evaluated Adequately ted Life or Replacement Schedule Established (If Require testablished to Identify Aging Degradation ta Regarding Aging Simulation Satisfied (If Required) ta Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate ta Regarding Spray Satisfied ta Regarding Radiation Satisfied ta Regarding Test Sequence Satisfied ta Regarding Test Failures or Severe Anomalies tany) Satisfied ta Regarding Functional Testing Satisfied ta Regarding Instrument Accuracy Satisfied ta Regarding Instrument Accuracy Satisfied ta Regarding Margins Satisfied (NUREG-0588, Cat. I)	
NRC OU	ALIFICATION 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	Lite
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	·

Documentation Not Made Available

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FRC Task No. 519/526

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NOTES:
The licensee has grounded PGR 1559 as evidence of qualification for this equipment item. Page 2 of PGR 1559
At the "Seen moror and isasion will be supplied with a flass 15 years
Certificate of Compliance form which will provide the application certification to this document.
No Presinge has not provided This Col C required to
The Jecuse has not provided This Cof C required to establish applicability of This document.
and the same of th
The Juinse has also provided PGR 5884 is evidence of
analification. PGR 5884 is a topical paper describing the
tests Derformed on a Joy far unit. There is insufficient
information in The paper to allow an independent
tests Derformed in a Jay far unit. There is insufficient information in the paper to allow an independent graduation of the methodologies and and the test
pesults.
Herause the lack of locumentation establishing similarity
If The installed benice and the tested Senice and the
lack of letail prinited in PGR 5884, This equipment item
is assigned to Category Ita "Equipment qualification not
established.

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FRC Assignment No. 13
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

EQUIPMENT ITEM NO. 28

ELECTRIC MOTOR, LOCATION NOT STATED

LINCOLN MODEL T2557

REQUIRED OPERATING TIME: 1 MONTH

TER CHECKSHEET NO. 28

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT SPRAY PUMP AHU MOTOR

SERVICE: CONTAINMENT SPRAY

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-2 (3.11-7 PAGE 7)

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

(R) RT, PB, CS (R) S, (R), M, I, OM, RPN, EXN, SEN, OT, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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

7a, 7b, 7a

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SUMM	ARY OF LICENSEE RESPONSES TO THE	NEC SER - ONLY CHECKED ITEMS ARE APPLICABLE
×	The Licensee (has/ hee ne t) provide	ed a response to the SER concerns.
	The Licensee (has/has not) specifiqualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
_	The Licensee has presented information outstanding qualification deficient	
-	The Licensee (tame/has not) propose item whose qualification has not has	ed a corrective action for this equipment been fully established.
	Justification for interim open Licensee for this equipment is	ration (has/has not) been provided by the tem.
	Corrective action specified by	y the Licensee:
	Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by acceptance to a Qualification testing of equipment (e submergence level ent from radiation source dditional (testing/analysis) mild environment
		er information for this equipment item sis for justification for interim
		for accomplishing the corrective
_	The Licensee states that the equipand/or should be exempted from env	ement item does not require qualification vironmental qualification.
		ATION EVALUATION CATEGORY BASED ON REVIEW
- CI	RCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.b	Qualified Modification	II.c Qualified Life Deficiency III.a Exempt
	Qualificat on Not Established	III.b Not in Scope
II.b	Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM			
		DESIGNATION:	
NRC REG	QUIREMENTS	X = DEFICIENCY	
Adequate Aging I Qualification Criter: Criter:	nted Evidence of Qualification Adequate te Similarity Between Equipment and Test Specimen Establ Degradation Evaluated Adequately ied Life or Replacement Schedule Established (If Require in Established to Identify Aging Degradation ia Regarding Aging Simulation Satisfied (If Required) ia Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate ia Regarding Spray Satisfied ia Regarding Radiation Satisfied ia Regarding Test Sequence Satisfied ia Regarding Test Sequence Satisfied ia Regarding Test Failures or Severe Anomalies Any) Satisfied ia Regarding Functional Testing Satisfied ia Regarding Instrument Accuracy Satisfied uration Margin (1 hour + Function Time) Satisfied	-	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)		
	ALIFICATION CATEGORY	DESIGNATION: X = CATEGORY	
I.a	Equipment Qualified		
I.b	Equipment Qualification Pending Modification	and the same	
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 Equipment Exempt From Qualification

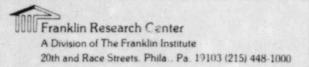
Documentation Not Made Available

Equipment Not in the Scope of the Qualification Review

III.a

IV

III.b



NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____579 / 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EOUIPMENT ITEM NO. 29

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL T2523

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 29

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PENETRATION ROOM COOLER MOTOR

SERVICE: PENETRATION ROOM COOLING

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-4 (3.11-7 PAGE 7)

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

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

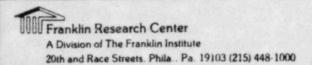
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

Page

SUMM	MARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABL
×	The Licensee (has/has-nat) provide	ded a response to the SER concerns.
-		fically stated that the equipment is hen exposed to the applicable DBE
-	The Licensee has presented informoutstanding qualification deficie	
×	The Licensee (has/her ast) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
		eration (has/ has no t) been provided by the item.
	X Corrective action specified	by the Licensee:
	Equipment replacement will Equipment modification	th qualified equipment
	Equipment relocation above	
		ment from radiation source
		additional (testing/analysis)
	Equipment relocation to	
	Qualification testing of Other (equipment in progress
		her information for this equipment item asis for justification for interim
		rovided a schedule for the proposed e for accomplishing the corrective
_	The Licensee states that the equi	ipment item does not require qualification nvironmental qualification.
nper	ICNATION OF RESULTANT NEC CHALLES	CATION EVALUATION CATEGORY BASED ON REVIEW
	IRCLED ITEM ONLY: (See Section 3	
The second second	Qualified	II.c Qualified Life Deficiency
	Modification	III.a Exempt
	a Qualification Not Established	
II.	o Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REC	UIREMENTS	DESIGNATION: X = DEFICIENCY
Documen	ated Evidence of Qualification Adequate	_×_
Adequat	e Similarity Between Equipment and Test Specimen Establ:	ished
Aging I	Degradation Evaluated Adequately	
Qualifi	led Life or Replacement Schedule Established (If Required	i)
Program	Established to Identify Aging Degradation	
Criteri	la Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	La Regarding Spray Satisfied	
	ia Regarding Submergence Satisfied	
	ia Regarding Radiation Satisfied	
	ia Regarding Test Sequence Satisfied	
Criteri	ia Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	ia Regarding Functional Testing Satisfied	
Criter	ia Regarding Instrument Accuracy Satisfied	
Toot D	ration Margin (1 hour + Function Time) Satisfied	
Critor	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
CIICEI	a Regarding Margins Sacrifica (Motato 5500, 521-1,	
		DESIGNATION:
NRC OU	ALIFICATION CATEGORY	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	
	booting to the man market	

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ITEM NO. 30

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BLUDING

LINCOLN MODEL T2518

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 30

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): RHR PUMP COOLER FAN MOTOR

SERVICE: RHR PUMP COOLER

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-5 (3.11-7 PAGE 6)

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

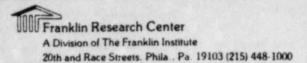
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4e, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c,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

7a, 7b, 7c

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICAB	LE
X The Licensee (has/Ass t) 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.	
X Corrective action specified by the Licensee:	
Equipment replacement with qualified equipment Equipment modification	
Equipment relocation above submergence level	
Relocate or shield equipment from radiation source	
Verify qualification by additional (testing/analysis)	
Equipment relocation to a mild environment	
Qualification testing of equipment in progress)	
The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.	
X The Licensee (*** has not) 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.	
PROTONIATON OR PROGRAMM VIDO OUTLINESS AND	
- CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)	
I.a 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	



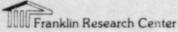
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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ___5/9/526____

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REO	UIREMENTS	DESIGNATION: X = DEFICIENCY
N. P. S. S.		
	ted Evidence of Qualification Adequate	_X_
Adequate Similarity Between Equipment and Test Specimen Establishe		ished
Aging D	egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Require	
Qualifi	d)	
Program	Established to Identify Aging Degradation	
	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	-
	Peak Pressure Adequate	
	Duration Adequate	
o Required Profile Enveloped Adequately		
o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied		
Criteri	a Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied		
Criteria Regarding Functional Testing Satisfied		
Criteri	ia Regarding Instrument Accuracy Satisfied	
Test Du	ration Maggin (1 hour + Function Time) Satisfied	
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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	w
TV	Documentation Not Made Available	



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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3/

EQUIPMENT ITEM NO. 31

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL T2518

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO, 31

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): SIS PUMP COOLER FAN MOTOR

SERVICE: SIS PUMP COOLER

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-6 (3.11-7 PAGE 6)

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, (M) RPN, EXN, SEN, QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents Checksheet Page No. Equipment Item

Summary of Licensee Responses to the NRC SER 16

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER 3a, 3b, 3c, 3d

System Consideration Review 4a, 4b, 4c, 4d, 4e, 4£ Equipment Environmental Qualification Review sa, 5b, 5c, 5d, 5e, 5£,

5g, 5h, 5i, 5j

Installed TMI Lessons Learned Implementation Equipment Summary

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

Page

SUMMARY OF LICENSEE RESPONSES TO THE M	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has-not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
X The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment peen fully established.
✓ Justification for interim open Licensee for this equipment it	ration (has/bee not) been provided by the tem.
X Corrective action specified by	the Licensea:
X Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by additional equipment relocation to a Qualification testing of equipment (e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW 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 SUMMARY FORM							
		DESIGNATION:					
NRC REC	UIREMENTS	X = DEFICIENCY					
Occuiten	ted Evidence of Qualification Adequate	_X_					
dequat	e Similarity Between Equipment and Test Specimen Establ	ished					
ging D	egradation Evaluated Adequately						
ualit	ad Life or Replacement Schedule Established (If Require	(b)					
rogram							
riteri	a Regarding Aging Simulation Satisfied (If Required)						
	a Regarding Temperature/Pressure Exposure:						
0	Peak Temperature Adequate						
0	Peak Pressure Adequate						
	Duration Adequate						
o Required Profile Enveloped Adequately							
o Steam Exposure (If Required) Adequate							
riteri	a Regarding Spray Satisfied						
Criteria Regarding Submergence Satisfied							
Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies ('f Any) Satisfied Criteria Regarding Functional Testing Satisfied							
					Criteri	a Regarding Instrument Accuracy Satisfied	
					rest Du	ration Margin (1 hour + Function Time) Satisfied	Corcular spin
					Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
					- Le		DESIGNATION:
	A TOTAL CAMPOON	X = CATEGORY					
RC QUA	ALIFICATION CATEGORY	A - CAILGORI					
.a	Equipment Qualified						
.b	Equipment Qualification Pending Modification	<u>X</u>					
I.a	Equipment Qualification Not Established						
d.I	Equipment Not Qualified						
II.c	Equipment Satisfies All Requirements Except Qualified	Lite					
	or Replacement Schedule Justified						
III.a	Equipment Exempt From Qualification						
d.II	Equipment Not in the Scope of the Qualification Review	-					
IV	Documentation Not Made Available						

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ITEM NO. 32

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL T2518

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 32

LICENSEE REFERENCE(S): MOT CITED

FUNCTION (PLANT ID): SENTRIFUGAL CHARGING PUMP COOLER FAN MOTOR

SERVICE: CENTRIFUGAL CHARGING PUMP COOLER FAN

LICENSIE SURMITTAL: SCEW(S): NEB-ECS-7 (3.11-7 PAGE 6)

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







Maintenance and Replacement Schedule Summary





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



7a, 7b, 70

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 40, 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

A Dission of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ____5/9/526

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SUMMARY OF LICENSEZ RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficien	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
	ration (has/has not) been provided by the tem.
X Corrective action specified by	the Licensee:
<pre>Equipment replacement with Equipment modification</pre>	n qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipme	ent from radiation source
Verify qualification by ad	dditional (testing/analysis)
Equipment relocation to a	mild environment
Qualification testing of e	equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	
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

III.b

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 PRC Centract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

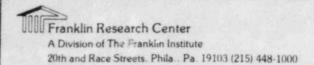
Page ?

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a

Equipment Not in the Scope of the Qualification Review

Documentation Not Made Available



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13, FRC Task No. _5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

EQUIPMENT ITEM NO. 33

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL T2556

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 33

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CCS PUMP AND AFP PUMP AHU MOTOR

SERVICE: CCS PUMP AND AFP PUMP AHU

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-8 (3.11-6 PAGE 11)

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



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 la

Summary of Licensee Responses to the NRC SER 16

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER 3a, 3b, 3c, 3d

System Consideration Review 4a, 4b, 4c, 4d, 4c, 4£ Equipment Environmental Qualification Review 5a, 5b, 5c, 5d, 5e, 5f,

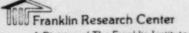
-5g, 5h, 5i, 5j

Installed TMI Lessons Learned Implementation 6a, 6b Equipment Summary

Maintenance and Replacement Schedule Summary -7a, 7b, 7e A Dission 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. 5/9/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/hau not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specification who environmental service conditions.	
The Licensee has presented information outstanding qualification deficient	
X The Licenses (has/has not) propose item whose qualification has not	ed a corrective action for this equipment been fully established.
	ration (has/hes not) been provided by the tem.
× Corrective action specified by	y the Licensee:
	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Pocumentation Not Available



A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-78-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

	DESIGNATION:	
NRC REQUIREMENTS	X = DEFICIENCY	
Documented Evidence of Qualification Adequate	_ <u>X</u>	
Adequate Similarity Between Equipment and Test S	pecimen Established	
Aging Degradation Evaluated Adequately		
Qualified Life or Replacement Schedule Establish	ed (If Required)	
Program Established to Identify Aging Degradation		
Criteria Regarding Aging Simulation Satisfied (I	f 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 Instrument Accuracy Satisfied		
Test Duration Margin (1 hour + Function Time) Sa	tisfied	
Criteria Regarding Margins Satisfied (NUREG-0588	, Cat. I)	
	DESIGNATION:	
NRC QUALIFICATION CATEGORY	X = CATEGORY	
I.a Equipment Qualified	tion X	
I.b Equipment Qualification Pending Modifica		
II.a Equipment Qualification Not Established		
II.b Equipment Not Qualified	on Ouglified Life	
II.c Equipment Satisfies All Requirements Exc	sebe Aggittied pire	
or Replacement Schedule Justified		
III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualif	ication Review	
III.b Equipment Not in the Scope of the Qualif	TOUCION NEVIEW	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

EQUIPMENT ITEM NO. 34

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

RELIANCE MODEL 3Y362208

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 34

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GAS TREATMENT SYSTEM FAN MOTOR

SERVICE: AUXILIARY BUILDING GAS TREATMENT SYSTEM

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-9 (3.11-6 PAGE 11)

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









Maintenance and Replacement Schedule Summary





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



7a, 7b, 7c

Not stated, Not applicable

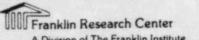
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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	42, 4b, 4c, 4d, 4e, 4£
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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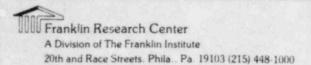
SUMMARY OF LICENSEE RESP	PONSES TO THE NRC S	SER - ONLY CHECKED IT	EMS ARE APPLICABLE
Ine Licensee (has/he	e net) provided a	response to the SER	concerns.
The state of the s	1 function when ex	y stated that the eq	
The Licensee has pre outstanding qualific		which shows there a	re no
X The Licensee (has/hasitem whose qualification)			r this equipment
	or interim operations equipment item.	on (has/h as no t) been	provided by the
X Corrective action	n specified by the	Licensee:	
Equipment reguipment modern	placement with quadification	lified equipment	
Equipment re	location above sub	mergence level	
		rom radiation source	
		onal (testing/analys	is)
	location to a mild		
Other (n testing of equip	ment in progress)
		formation for this ed or justification for	
		d a schedule for the accomplishing the co	
The Licensee states and/or should be exer			
DESIGNATION OF RESULTANT - CIRCLED ITEM ONLY: (Se			BASED ON REVIEW
I.a Qualified		.c Qualified Life De	ficiency
I.b Modification/		I.a Exempt	ELICIENCY
II.a Qualification Not Es			
II.b Not Qualified		Documentation Not	Available



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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	<u>w</u>
		DESIGNATION: X = DEFICIENCY
NRC REC	UIREMENTS	A - DEFICIENCE
Documen	ted Evidence of Qualification Adequate	ished
Adequat	e Similarity Between Equipment and Test Specimen Establi	ished
Aging D	egradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (If Required	i)
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	MANAGEMENT.
	Peak Pressure Adequate	
0	Duration Adequate	-
	Required Profile Enveloped Adequately	-
0	Steam Exposure (If Required) Adequate	-
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	a Regarding Functional Testing Satisfied	
Criter	la Regarding Instrument Accuracy Satisfied	
Test D	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC OU	ALIFICATION CATEGORY	X = CATEGORY
THE QUI		
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	
	or repracement bonedare daberree	HOT MADE TO THE
III.a	Equipment Exempt From Qualification	
III.a III.b		



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

EQUIPMENT ITEM NO. 35

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE MODEL 76D55052

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 35

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): 480V BOARD ROOM AHU MOTOR

SERVICE: 480 V BOARD ROOM AHU

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-10 (3.11-6 PAGE 11)

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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

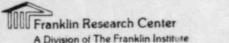
Equipment Summary

Maintenance and Replacement Schedule Summary

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FRC Project No. C5257
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SUMM	MARY OF LICENSEE RESPONSES TO THE NRC S	ER - ONLY CHECKED ITEMS ARE APPLICABLE
×	The Licensee (has/has not) provided a	response to the SER concerns.
(The Licensee (has/has not) specifically qualified and/or will function when expensions environmental service conditions.	
	The Licensee has presented information outstanding qualification deficiencies	
	The Licensee (has/hes-not) proposed a item whose qualification has not been	
	Justification for interim operation Licensee for this equipment item.	n (has/has-not) been provided by the
	X Corrective action specified by the	Licensee:
	Equipment replacement with qua-	lified equipment
	Equipment relocation above sub	mergence level
	Relocate or shield equipment f	om radiation source
	Verify qualification by addition	
	Equipment relocation to a mild	environment
	Qualification testing of equip	ment in progress
	The Licensee has provided other in that can be construed as a basis for operation.	
	X The Licensee (pas/has not) provide corrective action. (Schedule for action	
	The Licensee states that the equipment and/or should be exempted from environ	그리고 있는 생물을 하는 것이 없는 것이었다면 없는 것이 없는 것이 없는 것이었다면 없는 것이 없는 것이 없는 것이었다면 없는 없는 것이었다면 없는 없었다면 없는 것이었다면 없었다면 없는 것이었다면 없다면 없었다면 없다면 없었다면 없었다면 없었다면 없었다면 없었다
DEST	GNATION OF RESULTANT NRC QUALIFICATION	EVALUATION CATEGORY BASED ON REVIEW
	RCLED ITEM ONLY: (See Section 3 of th	
Y.a	Qualified II	c Qualified Life Deficiency
		I.a Exempt
-		I.b Not in Scope
		Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM			
		DESIGNATION:	
NRC REG	QUIREMENTS	X = DEFICIENCY	
Documen	nted Evidence of Qualification Adequate	shed X	
Adequat	te Similarity Between Equipment and Test Specimen Establi	shed	
Asing I	Degradation Evaluated Adequately		
Qualifi	ied Life or Replacement Schedule Established (If Required)	
Program	n Established to Identify Aging Degradation		
Criter	ia Regarding Aging Simulation Satisfied (If Required)		
Criter	a Regarding Temperature/Pressure Exposure:		
0			
0	Peak Pressure Adequate		
	Duration Adequate		
0	Required Profile Enveloped Adequately		
0	Steam Exposure (If Required) Adequate		
Criter	ia Regarding Spray Satisfied		
Criter	ia Regarding Submergence Satisfied		
Criter	ia Regarding Radiation Satisfied		
Criteria Regarding Test Sequence Satisfied			
Criter	ia Regarding Test Failures or Severe Anomalies		
	Any) Satisfied		
Criter	ia Regarding Functional Testing Satisfied		
Criter:	ia Regarding Instrument Accuracy Satisfied		
Test Di	uration Margin (1 hour + Function Time) Satisfied		
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)		
		DESIGNATION:	
NRC QUA	ALIFICATION CATEGORY	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 I	life	
	or Replacement Schedule Justified		
III.a	Equipment Exempt From Qualification		
III.b	Equipment Not in the Scope of the Qualification Review		
TV	Documentation Not Made Available		

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

EQUIPMENT ITEM NO. 36

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL T2518

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 36

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): EMERGENCY GAS TREATMENT AHU MOTOR

SERVICE: EMERGENCY GAS TREATMENT AHU

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-11 (3.11-6 PAGE 10)

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

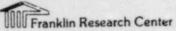
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3 a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c,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

7a, 7b, 7c

A Dission of The Franklin Institute 20th and Race Streets, Phila. Pa. 19103 (215) 448-1000 FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	d a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	cally stated that the equipment is n exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
X The Licensee (has/has not) propose item whose qualification has not b	d a corrective action for this equipment een fully established.
X Justification for interim oper Licensee for this equipment it	ation (has/hae-not) been provided by the em.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipme	
Verify qualification by ad	ditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e	quipment in progress
The Licensee has provided other that can be construed as a bas operation.	r information for this equipment item is for justification for interim
X The Licensee (max/has not) pro- corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipment and/or should be exempted from env	ment item does not require qualification ironmental qualification.
DESTANTION OF DESILERAND AND OUR TOTAL	TION THAT HAM YOU GAMPGOON CARRY ON THE
- CIRCLED ITEM ONLY: (See Section 3 o.	TION EVALUATION CATEGORY BASED ON REVIEW f this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification II.a Qualification Not Established	III.a Exempt
II.b Not Qualified	III.b Not in Scope IV Documentation Not Available
***************************************	The production of Mariante



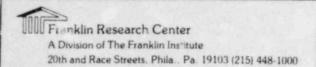
A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19163 (215) 448-1000 NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. __5/9/526____

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REC	UIREMENTS	DESIGNATION: X = DEFICIENCY
		×
Documen	ted Evidence of Qualification Adequate	NAMES AND ADDRESS OF THE PARTY
Adequat	e Similarity Between Equipment and Test Specimen Establ	Ished
Aging D	egradation Svaluated Adequately	4)
Qualifi	ed Life or Replacement Schedule Established (If Require	a)
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
0	ia Regarding Spray Satisfied	
Criteri	ia Regarding Submergence Satisfied	
Criteri	a Regarding Radiation Satisfied	
	ia Regarding Test Sequence Satisfied	
Criteri	ia Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	ia Regarding Functional Testing Satisfied	
Criteri	ia Regarding Instrument Accuracy Satisfied	EL COMPANY SAME
Track D	uration Margin (1 hour + Function Time) Satisfied	
Critor	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
Criter	a Regarding Margins Satisfied (NORES-0500) cat. 1/	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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	W
IV	Documentation Not Made Available	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ITEM NO. 37

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL T2523

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 37

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): SPENT FUEL PIT PUMP AHU MOTOR

SERVICE: SPENT FUEL PIT PUMP AHU

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-12 (3.11-6 PAGE 10)

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

RT OT RT, PH CS, A, S, (R) M I, M, RPN, EXN, SEN, QI RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

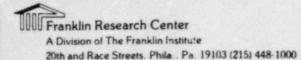
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c,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

7a, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE M	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
	ration (has/hae aot) been provided by the tem.
X Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	
Equipment relocation above	
Relocate or shield equipme	
Verify qualification by ad	dditional (testing/analysis)
Equipment relocation to a	mild environment
Qualification testing of e	equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from environment	oment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED 1TEM ONLY: (See Section 3 of	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC RE	QUIREMENTS	DESIGNATION: X = DEFICIENCY
Documer	nted Evidence of Qualification Adequate	
Adequa	te Similarity Between Equipment and Test Specimen Est	
	Degradation Evaluated Adequately	
Qualif	ied Life or Replacement Schedule Established (If Requ	ired)
	m Established to Identify Aging Degradation	
Criter	ia Regarding Aging Simulation Satisfied (If Required)	
Criter	ia Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
0		
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	ia Regarding Spray Satisfied	
	ia Regarding Submergence Satisfied	
	ia Regarding Radiation Satisfied	
	ia Regarding Test Sequence Satisfied	
	ia Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	ia Regarding Functional Testing Satisfied	
Criter	ia Regarding Instrument Accuracy Satisfied	
Toot Di	uration Margin (1 hour + Function Time) Satisfied	
Critar	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
CLI SEL	Ta Regarding Margins Sucretice (Money 1997) 1997	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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 Qualifi	ed Life
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Rev	iew
IV	Documentation Not Made Available	

20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 12 FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

EQUIPMENT ITEM NO. 38

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL TDUP

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 38

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): BORIC ACID TRANSFER PUMP A-A AND B-B MOTOR (MTRB-62-230A

AND 232B)

SERVICE: BORIC ACID TRANSFER PUMP

LICENSEE SUBMITTAL: SCEW(S): NEB-62-38 (3.11-7 PAGE 18, 3.11-8 PAGE 5)

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	la
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	7 a, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/hes web) provid	led a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
Y The Licensee (has/has not) propositem whose qualification has not	ed a corrective action for this equipment been fully established.
_X Justification for interim ope Licensee for this equipment i	ration (has/hae not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with	h qualified equipmont
Equipment relocation above	e submergence level
Relocate or shield equipme	ent from radiation source
X Verify qualification by a	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of a	equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	pment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 c	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	
II.b Not Qualified	IV Documentation Not Available

A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

		DESIGNATION:
NRC REC	UIREMENTS	X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	_×_
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished
Aging D	egradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (If Require	d)
Program	Established to Identify Aging Degradation	-
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	-
0		
0	Duration Adequate	-
	Required Profile Enveloped Adequately	
0		
Criteri	a Regarding Spray Satisfied	MANAGEMENT .
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	a Regarding Functional Testing Satisfied	
Criter	a Regarding Instrument Accuracy Satisfied	
Test Du	gration Margin (1 hour * Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
		X = CATEGORY
NRC QUA	ALIFICATION CATEGORY	A - CATEGORI
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 Revie	W
IV	Documentation Not Made Available	

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

EQUIPMENT ITEM NO. 39

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE MODEL 5809P24

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 39

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): RHR PUMP 1A-A, 1B-B, MOTOR (MTRA-74-10A,-74-20B)

SERVICE: RHR PUMP

LICENSEE SUBMITTAL: SCEW(S): NEB-74-39 (3.11-7 PAGE 28, 3.11-8 PAGE 41)

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,

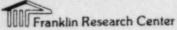
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
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	70. 7b. 7c

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The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions. The Licensee has presented information which shows there are no outstanding qualification deficiencies. X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established. X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item. X Corrective action specified by the Licensee: Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source X Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress Other (The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation. X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action B2070) 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 REVICENCED ITEM ONLY: (See Section 3 of this TER for Legend) I.a. Qualified II.c. Qualified Life Deficiency III.a Exempt	SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
qualified and/or will function when exposed to the applicable DBE environmental service conditions. The Licensee has presented information which shows there are no outstanding qualification deficiencies. X The Licensee (has/has met) proposed a corrective action for this equipme item whose qualification has not been fully established. X Justification for interim operation (has/has met) been provided by the Licensee for this equipment item. X Corrective action specified by the Licensee: Equipment replacement with qualified equipment Equipment modification Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source X Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress Other (The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation. X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 82070) 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 REVICENCIED ITEM ONLY: (See Section 3 of this TER for Legend) I.a Qualified II.c Qualified Life Deficiency III.a Exempt	★ The Licensee (has/hes not) provid	ad a response to the SER concerns.
outstanding qualification deficiencies. X The Licensee (has/has not) proposed a corrective action for this equipme item whose qualification has not been fully established. X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item. X Corrective action specified by the Licensee: Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source X Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress Other (The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation. X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 82070) 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 REVI- CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend) I.a Qualified II.c Qualified Life Deficiency III.a Exempt	qualified and/or will function wh	en exposed to the applicable DBE
item whose qualification has not been fully established. X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item. X Corrective action specified by the Licensee: Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source X Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress Other (The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation. X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 82070) 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 REVICENCED ITEM ONLY: (See Section 3 of this TER for Legend) I.a Qualified II.c Qualified Life Deficiency III.a Exempt		
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Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source X Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress Other (The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation. X The Licensee (has/nee not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 82070) 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 REVICTIVE CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend) I.a Qualified II.c Qualified Life Deficiency III.a Exempt		
Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source X Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress Other (The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation. X The Licensee (has/nas-not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action 82070) 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 REVI CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend) I.a Qualified II.c Qualified Life Deficiency III.a Exempt	★ Corrective action specified b	y the Licensee:
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 **82070/**.) 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 REVIOUS CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend) I.a Qualified **II.c Qualified Life Deficiency III.a Exempt*	Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by acceptance Equipment relocation to a Qualification testing of	e submergence level ent from radiation source dditional (testing/analysis) mild environment
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and/or should be exempted from environmental qualification. DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVI - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend) I.a Qualified II.c Qualified Life Deficiency III.a Exempt	corrective action. (Schedule	ovided a schedule for the proposed for accomplishing the corrective
- CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend) I.a Qualified II.c Qualified Life Deficiency III.a Exempt	The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
I.b Modification/ III.a Exempt	DESIGNATION OF RESULTANT NRC QUALIFICATION OF CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
the supplied that the supplied of the supplied of the supplied to the supplied of the supplied to the supplied	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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NRC RE	QUIREMENTS	DESIGNATION: X = DEFICIENCY
Docume	nted Evidence of Qualification Adequate	<u>×</u>
Adequa	te Similarity Between Equipment and Test Specimen Establ	ished
ging	Degradation Evaluated Adequately	d)
qualif	ied Life or Replacement Schedule Established (If Require	d)
rogra	m Established to Identify Aging Degradation	
Criter	ia Regarding Aging Simulation Satisfied (If Required)	
	ia Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
0	Peak Pressure Adequate	
0	Duration Adequate	
0	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	ia Regarding Spray Satisfied	
Criter	ia Regarding Submergence Satisfied	
	ia Regarding Radiation Satisfied	
Criter	ia Regarding Test Sequence Satisfied	_
	ia Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
Criter	ia Regarding Functional Testing Satisfied	
Criter	ia Regarding Instrument Accuracy Satisfied	
Test D	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION
NRC QU	ALIFICATION CATEGORY	X = CATEGOR
,a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	×
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.D	Equipment Satisfies All Requirements Except Qualified	Life
	B1 C-b-dule Tombified	
	or Replacement Schedule Justified	-
II.c	Equipment Exempt From Qualification	
II.c III.a III.b		_

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

EQUIPMENT ITEM NO. 40

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, EL. 714'

WESTINGHOUSE MODEL TBDP

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 40

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): SPENT FUEL PIT PUMP MOTOR (MTRD-78-35T, 12A, 9B)

SERVICE: SPENT FUEL PIT PUMP

LICENSEE SUBMITTAL: SCEW(S): NEB-78-42 (3.11-8 PAGE 24, 3.11-7 PAGE 16)

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	la
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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
* The Licensee (has/has not) provide	ded a response to the SER concerns.
	fically stated that the equipment is non exposed to the applicable DBE
The Licensee has presented informoutstanding qualification deficie	
X The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
_X Justification for interim open Licensee for this equipment in	eration (has/bas not) been provided by the tem.
X Corrective action specified b	by the Licensee:
Equipment replacement wit	th qualified equipment
Equipment relocation abov	
	ent from radiation source
× Verify qualification by a	HANNEY HE BENEVER HER HER HER STORE HER HER HER HER HER HER HER HER HER H
Equipment relocation to a	
Qualification testing of	equipment in progress
Other ()
	er information for this equipment item sis for justification for interim
Y The Licensee (has/has act) pr	ovided a schedule for the proposed
	for accomplishing the corrective
action 820930	.)
The Licensee states that the equi	pment item does not require qualification
and/or should be exempted from en	vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification/	III.a Exempt
II.a Qualification Not Established	
II.b Not Qualified	IV Documentation Not Available

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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 Submergence Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: X = CATEGORY I.a Equipment Qualification Pending Modification III.a Equipment Not Qualified III.b Equipment Not Qualified III.c Equipment Satisfies All Requirements Except Qualified Life Or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not Made Available		EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	M
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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 Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: NRC QUALIFICATION CATEGORY I.a Equipment Qualified II.b Equipment Qualified II.c Equipment Satisfies All Requirements Except Qualified Life Or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.a Equipment Exempt From Qualification III.a Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review	Program	Established to Identify Aging Degradation	
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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 Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: NRC QUALIFICATION CATEGORY I.a Equipment Qualified I.b Equipment Qualification Pending Modification II.a Equipment Qualified 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			***************************************
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Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: 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	Criteri	a Regarding Functional Testing Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) NRC QUALIFICATION CATEGORY	Criter	ia Regarding Instrument Accuracy Satisfied	
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II.a Equipment Qualification Not Established II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qualified Life of Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	I.a	Equipment Qualified	
II.a Equipment Qualification Not Established II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qualified Life of Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	I.b		X
II.c Equipment Satisfies All Requirements Except Qualified Life of Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	II.a		
III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	II.D		
III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	II.c		Life
III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review			
III.b Equipment Not in the Scope of the Qualification Review	III.a	Equipment Exempt From Qualification	
IV Documentation Not Made Available	III.b		
	IV	Documentation Not Made Available	

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

EQUIPMENT ITEM NO. 41

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, EL. 690'

ALLIS-CHALMERS MODEL 30R56

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 41

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY FEED PUMP MOTOR (1A-A, 1B-B, 2A-A, 28-B)

SERVICE: AUXILIARY FEED PUMP

LICENSEE SUBMITTAL: SCEW(S): MEB-3-003

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,

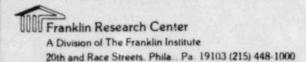
Not stated Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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	42, 4b, 4c, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5o, 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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has-act) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficien	
★ The Licensee (has/has not) propose item whose qualification has not be The Licensee (has/has not) propose	ed a corrective action for this equipment been fully established.
	ration (has/has not) been provided by the tem.
★ Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification	n qualified equipment
Equipment relocation above	e submergence level
Relocate or shield equipme	
	dditional (testing/analysis)
Equipment relocation to a	mild environment
Qualification testing of e	equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF RESULTANT NRC QUALIFICATION 3 OF RESULTANT NRC QUALIF	ATION EVALUATION CATEGORY BASED ON REVIEW
The section of	
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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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC RE	DUIREMENTS	DESIGNATION: X = DEFICIENCY
	nted Evidence of Qualification Adequate	_x_
	te Similarity Between Equipment and Test Specimen Estab	
	Degradation Evaluated Adequately	
aging i	ied Life or Replacement Schedule Established (If Requir	ed)
Program Established to Identify Aging Degradation		
Critar	ia Regarding Aging Simulation Satisfied (If Required)	-
Criteria Regarding Temperature/Pressure Exposure: O Peak Temperature Adequate		
	Peak Pressure Adequate	
	Duration Adequate	
	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		
	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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 Revie	W
IV	Documentation Not Made Available	

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

EQUIPMENT ITEM NO. 42

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN, MODEL NOT STATED

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 42

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): EL734 A/C PUMP MOTOR (A-A, B-B)

SERVICE: EL. 734 A/C PUMP

LICENSEE SUBMITTAL: SCEW(S): MEB-31-001

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:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
Equipment Environmental Qualification Review	5a, 5b, 5e, 5d, 5e, 5£, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	-6a, 6b-

7a, 7b, 7e

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FRC Assignment No. 13
FRC Task No. 319/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	led a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
_X Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment replacement with Equipment modification	h qualified equipment
Equipment relocation above	e submergence level
Relocate or shield equipme	
Verify qualification by a	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of other (equipment in progress
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equip	pment item does not require qualification
and/or should be exempted from en	
DESIGNATION OF RESULTANT NRC QUALIFICATION 3 CONTROL OF THE CONTRO	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	
II.b Not Qualified	IV Documentation Not Available

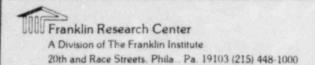
A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQ	UIREMENTS	DESIGNATION: X = DEFICIENCY
		· ·
Documen	ted Evidence of Qualification Adequate	<u>X</u>
	e Similarity Between Equipment and Test Specimen Esta	blished
Aging D	egradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (If Requi	red)
Program	Established to Identify Aging Degradation	-
Criteri	a Regarding Aging Simulation Satisfied (If Required)	eriocent/stares
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
Criteri	a Regarding Radiation Satisfied	-
Critegia Regarding Test Sequence Sacisfied		
Criteri	a Regarding Test Failures or Severe Anomalies	
	a Regarding Functional Testing Satisfied	
	a Regarding Instrument Accuracy Satisfied	
Toot Di	ration Margin (1 hour + Function Time) Satisfied	
Criter	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NDC OU	ALTELCATION CATECORY	X = CATEGORY
NRC QUA	ALIFICATION CATEGORY	A - CHILDONI
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 Qualifi	ed Life
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
IXI.b	Equipment Not in the Scope of the Qualification Rev	iew
IV	Documentation Not Made Available	



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

EQUIPMENT ITEM NO. 43

ELECTRIC MOTOR LOCATED IN THE AUXILIARY FUILDING

GENERAL ELECTRIC MODEL 5K256AN205 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 43

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY AIR COMPRESSOR MOTOR (A-A, B-B)

SERVICE: AUXILIARY AIR COMPRESSOR

LICENSEE SUBMITTAL: SCEW(S): MEB-32-002 (3.11-6 PAGE 14, 3.11-8 PAGE 25)

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

Contents









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



Checksheet Fage No.

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Equipment Item la 16 Summary of Licensee Responses to the NRC SER Equipment Environmental Qualification Summary Forms 2

3a, 3b, 3c, 3d Licensee Response to NRC SER

4b, 4c, 4d, 4e, 4f System Consideration Review 5a, 5b, 5c, 5d, 5e, 5f, Equipment Environmental Qualification Review 5q, 5h, 5i, 57

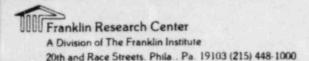
Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary 7a, 7b, 7e

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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SUMMARY OF LICENSER RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
	THE SECOND TIES AND REPORTED
X The Licensee (has/has-not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
★ The Licensee (has/has not) propose item whose qualification has not be The Licensee (has/has not) Propose	ed a corrective action for this equipment been fully established.
Z Justification for interim oper Licensee for this equipment is	ration (has/ has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above	e submergence level
Relocate or shield equipme	ent from radiation source dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e	equipment in progress
	er information for this equipment item sis for justification for interim
T I	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from envi	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification/	III.a Exempt
II.a Qualification Not Established	
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

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

PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

EQUIPMENT ITEM NO. 44

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

SIEMENS-ALLIS, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 44

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): COMPONENT COOLING WATER PUMP MOTOR

SERVICE: COMPONENT COOLING WATER FROM P LICENSEE SUBMITTAL: SCEW(S): MEB-70-024

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	la
Summary of Licensee Responses to the NRC SER	15
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 30, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
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, 7e

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when the environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
★ The Licensee (has/has not) propositem whose qualification has not.	ed a corrective action for this equipment been fully established.
_X Justification for interim open Licensee for this equipment is	ration (has/has met) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification	
Equipment relocation above	
Relocate or shield equipme	
Verify qualification by ac	
Equipment relocation to a	
Qualification testing of a Other (equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equip	oment item does not require qualification
and/or should be exempted from env	
DESIGNATION OF RESULTANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	
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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FRC Project No. C5257
FRC Assignmen No. 13
FRC Task No. 5/9/526

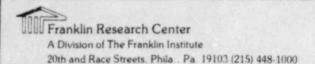
Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
		SESIGNATION: X = DEFICIENCY
NRC REC	UIREMENTS	A - DELICIONES
Documen	ted Evidence of Qualification Adequate	X
Adequat	2 Similarity Between Equipment and Test Specimen Establ	ished
Aging D	Degradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (If Require	d)
Program Established to Identify Aging Degradation		-
Criteri	a 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 Instrument Accuracy Satisfied		
Test D	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION
NRC QU	ALIFICATION CATEGORY	X = CATEGOR
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	
TTT D	Equipment Not in the Scope of the Qualification Revie	W

Documentation Not Made Available

IV



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13/ FRC Task No. 5/9/526

Page la

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

EQUIPMENT ITEM NO. 45

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE MOEL HSW1

REQUIRED OPERATING TIME: 1 MONTH

TER CHECKSHEET NO. 45

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT SPRAY PUMP MOTOR (1AA, 1BB)

SERVICE: CONTAINMENT SPRAY PUMPS

LICENSEE SUBMITTAL: SCEW(S): MEB-72-025 (3.11-7 PAGE 7)

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

Contents

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

Checksheet Page No.

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Equipment Item la Summary of Licensee Pesponses to the NRC SER 16 Equipment Environmental Qualification Summary Forms 2 Licensee Response to NRC SER 3a, 3b, 30, 3d System Consideration Review 4a, 4b, 4c, 4d, 4e, 4f Equipment Environmental Qualification Review Sa, Sb, Sc, Sd, Se, 59 5hr 51, 5j

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

Page 16

SUMM	SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECK	ED ITEMS ARE APPLICABLE
_×	X The Licensee (has/hes not) provided a response to the	SER concerns.
×	Y The Licensee (has/has net) specifically stated that t qualified and/or will function when emposed to the ap environmental service conditions.	
-	The Licensee has presented information which shows the outstanding qualification deficiencies.	ere are no
-	The Licensee (has/has not) proposed a corrective acti item whose qualification has not been fully establish	
		been provided by the
	Corrective action specified by the Licensee:	
	Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation s Verify qualification by additional (testing/a Equipment relocation to a mild environment Qualification testing of equipment in progres Cther (ource nalysis)
	The Licensee has provided other information for t that can be construed as a basis for justificatio operation.	
	The Licensee (has/has not) provided a schedule for corrective action. (Schedule for accomplishing taction	
	The Licensee states that the equipment item does not and/or should be exempted from environmental qualific	
	DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CAT	
- CI	- CIRCLED ITEM ONLY: (See Section 3 of this TER for Lege	nd)
	I.a Qualified II.c Qualified L I.b Modification III.a Exempt	ife Deficiency
	II.a Qualification Not Established III.b Not in Scop	
II.b	II.b Not Qualified IV Documentati	on Not Available

Page 2

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	M
NRC REQ	UIREMENTS	DESIGNATION: X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Establi	shed X
Aderidat	egradation Evaluated Adequately	
A ing D	ed Life or Replacement Schedule Established (If Required	1)
Qualiti	Established to Identify Aging Degradation	
Critori	a Regarding Aging Simulation Satisfied (If Required)	
Critori	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
Critori	a Regarding Submergence Satisfied	
Critori	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION: X = CATEGORY
NRC QUA	LIFICATION CATEGORY	A - CHILDONI
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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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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NOTES:
The firence has provided an environmental analysis
attached to equipment qualification sheet MEB-72-025
for This equipment item. The licensee states in the
analysis that The insulation naterial is the motors were
tested and found acceptable per WCAP-8754 (PGR604) and
WCAP -7829 (PGR 606).
PGR 604 and 606 Pravide a listing of the materials
used in the denies tested. The Vicinsee has not
Describel a materials list of the installed sence so that the applicability of the test regents could be graduated.
The applicability of the test regorts could be graduated.



Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

EQUIPMENT ITEM NO. 46

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE MODEL 052H4-SBDP-MKB

REQUIRED OPERATING TIME: 5 MINUTES

TER CHECKSHEET NO. 46

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CENTRIFUGAL CHARGING PUMP OIL PUMP MOTOR (MTRB-62-108A-A

-104A-B)

SERVICE: OIL PUMP MOTOR

LICENSEE SUBMITTAL: SCEW(S): NE%-62-40 (3.11-7 PAGE 28)

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	la
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, 40, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5a, 5d, 5e, 5£ , 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b.
Maintenance and Replacement Schedule Summary	7a, 7b, 7c

Page 1b

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficient	
X The Licensee (has/has not) proposition whose qualification has not	ed a corrective action for this equipment been fully established.
	ration (has/has net) been provided by the tem.
X Corrective action specified by	y the Licensee:
	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW 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

Page 2

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		EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	DRM
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Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Margins (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: X = CATEGORY I.a Equipment Qualified I.b Equipment Qualification Pending Modification X = Category I.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			
(If Any) Satisfied Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) 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.a Equipment Not in the Scope of the Qualification Review	Criter	ia Regarding Test Failures or Severe Anomalies	
Criteria Regarding Functional Testing Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: 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 Mot in the Scope of the Qualification Review			
Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: 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			
DESIGNATION: **RC QUALIFICATION CATEGORY* **I.a Equipment Qualified* **II.a Equipment Qualified* **II.b Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Jestified* **III.a Equipment Exempt From Qualification (III.a Equipment Mot in the Scope of the Qualification Review* **III.a Equipment Mot in the Scope of the Qualification Review* **III.a Equipment Mot in the Scope of the Qualification Review*	Criter	ia Regarding Instrument Accuracy Satisfied	
DESIGNATION: 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	Test D	uration Margin (1 hour + Function Time) Satisfied	
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	Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
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 Jestified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review			DESIGNATION:
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	NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
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	I.a	Equipment Qualified	
II.a Equipment Qualification Not Established II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Jestified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	I.b		_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	II.a	Equipment Qualification Not Established	
or Replacement Schedule Jestified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	II.b	Equipment Not Qualified	
or Replacement Schedule Jestified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	II.c	Equipment Satisfies All Requirements Except Qualified	Life
III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review			
III.b Equipment Not in the Scope of the Qualification Review	III.a		
	III.b		W
	IV		

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. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ITEM NO. 47

HANDSWITCH LOCATED IN THE AUXILIARY BUILDING

CUTLER-HAMMER MODEL 10250T

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 47

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): LOCAL CONTROL (VARIOUS)

SERVICE: VARIOUS

LICENSEE SUBMITTAL: SCEW(S): EEB-HS-1 (3.11-6 PAGE 1, 16a, 3.11-7 PAGE 12a,

3.11-8 PAGE 2b, c, d, 3c, 4c, 5, 5b, 5c, 5d,

53, 6, 6b, 6c, 7b, 9b, 9c)

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

OT, 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	la
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 . wironmental 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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SUM	MARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
×	The Licensee (has/has net) provid	led a response to the SER concerns.
-	The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
-	The Licensee has presented inform outstanding qualification deficie	
<u>x</u>	The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
	Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by the tem.
	X Corrective action specified b	y the Licensee:
	Equipment replacement wit Equipment modification Equipment relocation abov Relocate or shield equipm Verify qualification by a Equipment relocation to a	e submergence level ent from radiation source dditional (testing/analysis)
	Qualification testing of Other (
		er information for this equipment item sis for justification for interim
		ovided a schedule for the proposed for accomplishing the corrective
	The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
	IGNATION OF RESULTANT NRC QUALIFICATION OF RESULTANT NRC QUALIFICATION 3 (See Section 3 of Secti	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.b II.a	Qualified Modification Qualification Not Established	
II.b	Not Qualified	IV Documentation Not Available

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. __5/9/526______

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMM	ARY FORM	
	DESIGNATION:	
NRC REQUIREMENTS	X = DEFICIENCY	
Documented Evidence of Qualification Adequate		
Adequate Similarity Between Equipment and Test Specimen		
Aging Degradation Evaluated Adequately		
Qualified Life or Replacement Schedule Established (If Re	equired)	
Program Established to Identify Aging Degradation		
Criteria Regarding Aging Simulation Satisfied (If Require	ed)	
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		
(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:	
NRC QUALIFICATION CATEGORY	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 Qual	lified Life	
or Replacement Schedule Justified		
III.a Equipment Exempt From Qualification		
III.b Equipment Not in the Scope of the Qualification	Review	

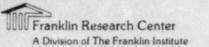
Documentation Not Made Available

IV

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. __5/9/526_

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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. _5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

EQUIPMENT ITEM NO. 48

HANDSWITCH LOCATED IN THE CONTAINMENT

CUTLER-HAMMER MODEL 10250T

REQUIRED OPERATING TIME: NOT REQUIRED

TER CHECKSHEET NO. 48

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): LOCAL CONTROL (VARIOUS)

SERVICE: VARIOUS

LICENSEE SUBMITTAL: SCEW(S): EEB-HS-1 (3.11-4 PAGE 9, 21a, 21b; 3.11-5 PAGE

5a, 5b)

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









ROT (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	la
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, 5 e, 5f, 5g, 5h, 5i, 5 j
Installed TMI Lessons Learned Implementation	6a, 6b

Equipment Summary

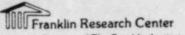
Maintenance and Replacement Schedule Summary

7a, 7b, 7c

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SUMMARY OF LICENSEE	RESPONSES TO THE	NRC SER	- ONLY CHECK	ED ITEMS ARE	E APPLICABLE
X The Licensee (ha	s/ bes not) provi	ded a res	ponse to the	SER concern	ıs.
The Licensee (ha qualified and/or environmental se	will function w	hen expos			
The Licensee has outstanding qual			ich shows th	ere are no	
★ The Licensee (ha					equipment
A CONTRACTOR OF THE PROPERTY O	n for interim op this equipment		has/has not)	been provid	led by the
X Corrective ac	ction specified	by the Li	censee:		
	t replacement wi	th qualif	ied equipmen	t	
	relocation abo	ve submer	gence level		
Relocate	or shield equip	ment from	radiation s	ource	
	× Verify qualification by additional (testing/analysis)				
	relocation to				
	ation testing of	equipmen	t in progres	s	
Other (_					
	has provided other				
	(ms/nas not) priction. (Schedule				
action)
The Licensee state	The second secon	The state of the s			ification

DESIGNATION OF RESULT					ON REVIEW
- CIRCLED ITEM ONLY:	(See Section 3	of this !	TER for Lege	nd)	
I.a Qualified		II.c	Qualified L	ife Deficien	cv
I.b Modification/			Exempt		
II.a Qualification No	t Established		Not in Scope	9	
II.b Not Qualified			Documentation		able

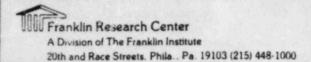


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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
		DESIGNATION:
NRC REC	UIREMENTS	= DEFICIENCY
	ted Evidence of Qualification Adequate	×
Adaguat	e Similarity Between Equipment and Test Specimen Establis	shed X
haina l	egradation Evaluated Adequately	
aging i	ed Life or Replacement Schedule Established (If Required)	
Qualiti	Established to Identify Aging Degradation	
Critori	a Regarding Aging Simulation Satisfied (If Required)	
Critori	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
0	Duration Adequate	
	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	-
Criteri	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	a Regarding Functional Testing Satisfied	
	la Regarding Instrument Accuracy Satisfied	
Toot D	ration Margin (1 hour + Function Time) Satisfied	
Critor	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
CIICEI.	a Regarding Margins Sacratica (No. 2007) Sacratical	
		DESIGNATION:
NRC OU	ALIFICATION CATEGORY	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 I	ile
	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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NOTES:
The beensee has promised an analysis to his
equipment item which state: " The material composition
of the selector switch components is mirecal-filled phendie
The licensee also states that The material is unaffected
by radiation doses of 3.9×108 rads and has a diffiction
temperature of 335% at 669512. The licensee has not
enaluater The other materials in The switch e.g. organic
Alal used to seal out maisture when mounted to an
exclosure, The cam mechanism, or any other materials
Therefore, qualification is not established.

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. _5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

EQUIPMENT ITEM NO. 49

TRANSFER SWITCH LOCATED IN THE AUXILIARY BUILDING

ELECTRO SWITCH MODEL SERIES 24 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 49

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): TRANSFER SWITCH (VARIOUS)

SERVICE: VARIOUS

LICENSEE SUBMITTAL: SCEW(S): FEB-XS-1 (3.11-6 PAGE 1, 12; 3.11-8 PAGE 2)

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, SMN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f , 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	4a, 6 b-

7a, 7b, 70

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SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/hes not) provided a response to the SER concerns.
The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
The Licensee has presented information which shows there are no outstanding qualification deficiencies.
_X The Licensee (has/hat mot) proposed a corrective action for this equipment item whose qualification has not been fully established.
X Corrective action specified by the Licensee:
Equipment replacement with qualified equipment Equipment modification
Equipment relocation above submergence level
Relocate or shield equipment from radiation source
Verify qualification by additional (testing/analysis)
Equipment relocation to a mild environment
Qualification testing of equipment in progress
X Other (REQUESTED QUAL DOCUMENTS FROM MANUFACTURER)
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/nas not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action
The Licensee states that the equipment item does not require qualification
and/or should be exempted from environmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)
I.a Qualified II.c Qualified Life Deficiency
I.b Modification III.a Exempt
II.a Qualification Not Established / III.b Not in Scope /
II.b Not Qualified IV Documentation Not Available
ar boomstied and investigate

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM			
		DESIGNATION:	
NRC REQ	UIREMENTS	X = DEFICIENCY	
	and Buidence of Qualification Adequate		
Adequat	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Establ	ished	
	egradation Evaluated Adequately		
Qualifi	ed Life or Replacement Schedule Established [If Require	ed)	
Program Established to Identify Aging Degradation			
Critori	a Regarding Aging Simulation Satisfied (If Required)		
Criteri	a Regarding Temperature/Pressure Exposure:		
	Peak Temperature Adequate		
0			
0			
0			
o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied			
	a Regarding Submergence Satisfied		
Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied			
	ny) Satisfied		
	a Regarding Functional Testing Satisfied		
	a Regarding Instrument Accuracy Satisfied		
Toot Du	ration Margin (1 hour + Function Time) Satisfied		
Critori	a Regarding Margins Satisfied (NUREG-0588, Cat. I)		
CIICELI	a regarding margins outstree (notes over, outs of		
		DESIGNATION:	
NRC QUA	ALIFICATION CATEGORY	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 Revie	w <u>×</u>	
T17	Dogumentation Not Made Available		

MILD ENVIRONMENT

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

EQUIPMENT ITEM NO. 50

DIFFERENTIAL PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

BARTON MODEL 288

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 50

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): NOT STATED (FIS-70-81, PDIS-313-305, PDIS-313-340)

SERVICE: NOT STATED

LICENSEE SUBMITTAL: SCEW(S): EEB-1012 (3.11-7 PAGE 2, 3.11-6 PAGE 3, 3.11-8

PAGE 20, 27)

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

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



Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Checksheet Page No. Contents

Equipment Item

la

Summary of Licensee Responses to the NRC SER

15

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER

3a, 3b, 3c, 3d

System Consideration Review

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

Equipment Environmental Qualification Review

5a, 5b, 50, 5d, 5e, 5f, 5g, 5h, 5i, 5j

6a, 6b

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

7a, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficien	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
	ration (has/has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by acceptance of the control	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF RESULTANT NRC QU	ATION EVALUATION CATEGORY BASED ON REVIEW 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. 50

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REG	QUIREMENTS	DESIGNATION: X = DEFICIENCY
		×
Documer	nted Evidence of Qualification Adequate te Similarity Between Equipment and Test Specimen Establ	ished X
Adequat	Degradation Evaluated Adequately	
Aging I	ed Life or Replacement Schedule Established (If Require	ed)
Qualiti	Established to Identify Aging Degradation	
Critori	ia Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	la Regarding Spray Satisfied	
Criter	ia Regarding Submergence Satisfied	
Criteri	a Regarding Radiation Satisfied	
Criter	ia Regarding Test Sequence Satisfied	
Criteri	ia Regarding Test Failures or Severe Anomalies Any) Satisfied	
Critori	ia Regarding Functional Testing Satisfied	
Criter	ia Regarding Instrument Accuracy Satisfied	
Toot Di	ration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
	in indicated the second	
		DESIGNATION:
NPC OU	ALIFICATION CATEGORY	X = CATEGORY
MIC OU		
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. 5/

EQUIPMENT ITEM NO. 51

PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 3301

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 51

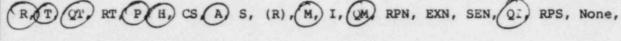
LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING HIGH PRESSURE (PDIS-30-148, 149)

SERVICE: AUXILIARY BUILDING PRESSURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1007 (3.11-6 PAGE 3, 3.11-8 PAGE 25)

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



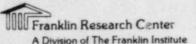
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 40, 4d, 4e, 4£
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	7 a, 7b, 7c

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/hambt) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/bas not) proposition whose qualification has not	ed a corrective action for this equipment been fully established.
	ration (has/has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with	n qualified equipment
Equipment relocation above	e submergence level
Relocate or shield equipme	
_X Verify qualification by ac	
Equipment relocation to a	
Qualification testing of a	equipment in progress
	er information for this equipment item sis for justification for interim
The Licensee (hec/has not) proceedive action. (Schedule action)	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	oment item does not require qualification
and or should be enemiated from ent	aronnentar quarriroacton.
DESIGNATION OF RESULTANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ___5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualified I.a Equipment Qualification Pending Modification I.b II.a Equipment Qualification Not Established Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a III.b Equipment Not in the Scope of the Qualification Review

Documentation Not Made Available

IV

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB 1007

Revision 2

Appendix 3

Sheet 1 of 1

The switches are required to operate in the following environment:

Temperature: 115°F Pressure: Atmospheric
Relative Humidity: 100%
Radiation: 40 year TID - 3.51x10² rads
Accident - 1.0x10⁴ rads

The manufacturer's specifications for the switches are as follows:

Temperature: 120°F Pressure: Atmospheric Relative Humidity: Not Specified Radiation: Not Specified

The temperature and pressure environment in which the switches are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

R2

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

EQUIPMENT ITEM NO. 52

PRESSURE SWITCH LOCATED IN THE WEST VALVE VAULT

BARTON MODEL 288

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 52

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY FEED PUMP ISOLATION (PDIS-1-17, 18)

SERVICE: FEED PUMP ISOLATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1030 (3.11-8 PAGE 3b)

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,

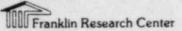
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Item	la
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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

Page 1b

SUM	MARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X	The Licensee (has/has not) provided a response to the SER concerns.
_	The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
_	The Licensee has presented information which shows there are no outstanding qualification deficiencies.
<u>x</u> .	The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
	✓ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
	X Corrective action specified by the Licensee:
	X Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from rediation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress
	Other ()
	X The Licensee (mac/nas 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.
	GNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW RCLED ITEM ONLY: (See Section 3 of this TER for Legend)
I.b II.a	Modification Not Established II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope Not Qualified IV Documentation Not Available

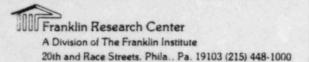


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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

Page 2

	EQUIPMEN	T ENVIRONMENTAL QUALIFICATION SUMMARY	FORM
			DESIGNATION:
NRC REC	UIREMENTS		X = DEFICIENCY
Documen	ted Evidence of	Qualification Adequate	ablished X
		tween Equipment and Test Specimen Esta	ablished
Aging D	egradation Eval	uated Adequately	
		acement Schedule Established (If Requ	ired)
Program	Established to	Identify Aging Degradation	
Criteri	a Regarding Agi	ng Simulation Satisfied (If Required)	
Criteri	a Regarding Tem	perature/Pressure Exposure:	
0	Peak Temperatur	e Adequate	
0	Peak Pressure A	dequate	-
0	Duration Adequa	te	-
0	Required Profil	e Enveloped Adequately	-
0	Steam Exposure	(If Required) Adequate	
	a Regarding Spr		
Criteri	a Regarding Sub	mergence Satisfied	
Criteri	a Regarding Rad	liation Satisfied	
Criteri	a Regarding Tes	t Sequence Satisfied	
Criteri	a Regarding Tes	t Failures or Severe Anomalies	
	ny) Satisfied		
Criteri	a Regarding Fun	ctional Testing Satisfied	
Criteri	a Regarding Ins	strument Accuracy Satisfied	
Test Du	ration Margin ((1 hour + Function Time) Satisfied	
Criteri	a Regarding Mar	gins Satisfied (NUREG-0588, Cat. I)	
			DESIGNATION:
NDC OIL	LIFICATION CATE	COPY	X = CATEGORY
NAC QUA	ELIFICATION CATE	JORI	
I.a	Equipment Qual		
I.b		lification Pending Modification	X
II.a	Equipment Qual	lification Not Established	
11.0	Equipment Not	Qualified	
		sfies All Requirements Except Qualifi	od Life
II.b			ed hire
II.b	or Replacement	Schedule Justified	
II.b II.c	or Replacement Equipment Exem	Schedule Justified Apt From Qualification	_
II.b II.c	or Replacement Equipment Exem Equipment Not	Schedule Justified	



Page 3a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB-1030 Rev 3 Appendix 3 Sheet 1 of 1

The switches are required to operate in the following environment:

Temperature:

307°F

Pressure:

22.9 PSIA

Relative Humidity: Radiation:

100%

40 year TID - 1.76 x 103 RADS Accident - 1 x 104 RADS

The manufacturer's specifications for the switches are as follows:

Temperature:

265°F

Pressure:

Atmospheric

Relative Humidity:

Not Specified (NEMA 4 enclosures)

Radiation:

Not Specified

The required pressure is well within the manufacturer's specification.

See generic position 4.1.5 and 4.1.8 for radiation and relative humidity.

The standard switch assemblies have been replaced with high temperature switches per NCP SQNEEB8004.

The above information shows justification for continued use of the devices. However, due to lask of sufficient documentation, TVA will replace the R 3 devices with qualified pressure switches.

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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

EQUIPMENT ITEM NO. 53

FLOW SWITCH LOCATED IN THE AUXILIARY BUILDING ELEV. 653'

BARTON MODEL 288

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 53

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): RHR PUMP MINIMUM FLOW SWITCH (FIS-74-12, 24)

SERVICE: RHR PUMP FLOW

LICENSEE SUBMITTAL: SCEW(S): NEB-74-35 (3.11-6 PAGE 19, 3.11-8 PAGE 10)

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

RATION RT, PH 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	la
Summary of Licensee Responses to the NRC SER	1b
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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

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has ast) provid	ded a response to the SER concerns.
	fically stated that the equipment is hen exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
X Justification for interim open Licensee for this equipment in	eration (has/ has not) been provided by the item.
X Corrective action specified b	by the Licensee:
Equipment replacement with Equipment modification	
Equipment relocation above Relocate or shield equipment	ve submergence level ment from radiation source
Verify qualification by a	additional (testing/analysis)
Equipment relocation to a	
Qualification testing of Other (equipment in progress
	ner information for this equipment item asis for justification for interim
	e for accomplishing the corrective
The Licensee states that the equi	pment item does not require qualification
and/or should be exempted from en	
DESIGNATION OF RESULTANT NRC QUALIFIC	CATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
T - O - I - C - Not Bot - Late - A	
II.a Qualification Not Established	III.b Not in Scope

Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQ	QUIREMENTS	X = DEFICIENCY
Da	nted Evidence of Qualification Adequate	
Documen	te Similarity Between Equipment and Test Specim	
	Degradation Evaluated Adequately	en bacubilanca
Aging D	ied Life or Replacement Schedule Established (I	f Required)
Qualiti	n Established to Identify Aging Degradation	
Critori	ia Regarding Aging Simulation Satisfied (If Req	uired)
Criteri	ia Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Duration Adequate	
	ia Regarding Spray Satisfied	
	ia Regarding Submergence Satisfied	
	ia Regarding Radiation Satisfied	
	ia Regarding Test Sequence Satisfied	
	ia Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	-
	ia Regarding Functional Testing Satisfied	
Criteri	ia Regarding Instrument Accuracy Satisfied	
Test Du	uration Margin (1 hour + Function Time) Satisfi	
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat)
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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 Qualificat	ion Review
IV	Documentation Not Made Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION PEVIEW OF EQUIPMENT ITEM NO. 53

LICENSEE RESPONSE TO NRC SER

Appendix to NEB-74-35

1. The switches are required to operate in the following environment:

Temperature: 126 F maximum

Pressure: atm RH: 30-80\$ (100\$ peak) Radiation: 1 X 10 rads

2. Manufacturer's specifications for the switches are:

Temperature: 200°F

Pressure: atm

RH: not specified (NEMA 4 enclosure)

Radiation: not specified

- Field verification indicates Switch 1-FIS-74-12 has no nameplate. However, the model No. which was supposed to be supplied for this application according to contract documentation, and that which has been field verified for FIS-74-24 is 0288. Therefore, it will be assumed for interim operation, that 1-PIS-74-12 is also a Barton 0288.
- 4. These switches are the same manufacturer and model as those covered by EQS EEB-1012. Justification for interim operation is identical to that given in that EQS. These components will either be qualified or replaced by June 1982.

E41236.27

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ITEM NO. 54

PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

CUSTOM COMPONENT MODEL 604G

REQUIRED OPERATING TIME:

TER CHECKSHEET NO. 54

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY COMPRESSOR LOW AIR PRESSURE (PS-32-62, 82, 85,

88)

SERVICE: LOW AIR PRESSURE ISOLATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1016 (3.11-6 PAGE 1, 3.11-8 PAGE 26)

FUNCTION (PLANT ID): AUXILIARY FEEDWATER PIPE BREAK DETECTION (PS-3-140A,

150A)

SERVICE: PIPE BREAK DETECTION

LICENSEE SUBMITTAL: SCEW(S): EEB-1016 (311-7 PAGE 1, 3.11-8 PAGE 26)

FUNCTION (PLANT ID): CONDENSATE STORAGE TANK HEADER PRESSURE (PS-3-139A, B,

D; 144A, B, D)

SERVICE: STEAM GENERATOR LEVEL BYPASS

LICENSEE SUBMITTAL: SCEW(S): EEB-1016 (3.11-7 PAGE 18, 3.11-8 PAGE 16)

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

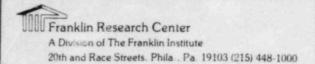
RAT QT RT, P(H) CS, A) S, (R), M I, M RPN, EXN, SEN, QI RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.	
Equipment Item	la, laz	
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, 5£ , 5g, 5h, 5i, 5j	
Installed TMI Lessons Learned Implementation Equipment Summary	-6a, 6b-	

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



Page la₂

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ITEM NO. 54 (CONTINUED)

FUNCTION (PLANT ID): AUXILIARY FEEDWATER PIPE BREAK DETECTION (PS-3-140B)

SERVICE: PIPE BREAK DETECTION

LICENSEE SUBMITTAL: SCEW(S): EEB-1016 (3.11-7 PAGE 27, 3.11-8 PAGE 3b)
FUNCTION (PLANT ID): AUXILIARY FEEDWATER PIPE BREAK DETECTION (PS-3-150b)

SERVICE: PIPE BREAK DETECTION

LICENSEE SUBMITTAL: SCEW(S): EEB-1016 (3.11-7 PAGE 28, 3.11-8 PAGE 3b)

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,

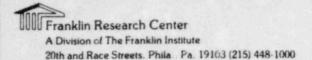
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f
Equipment Environmental Qualification Review	5g, 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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SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
	ically stated that the equipment is
The Licensee has presented information outstanding qualification deficien	
X The Licensee (has/herenet) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment it	ration (has/has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from environment	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION 3 CONTROL OF THE CONTRO	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	
T.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
NRC REC	QUIREMENTS	DESIGNATION: X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	shed _X_
	e Similarity Between Equipment and Test Specimen Establis	
Aging D	Degradation Evaluated Adequately	
	ed Life or Replacement Schedule Established (If Required	
	Established to Identify Aging Degradation	
	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	nny) Satisfied	
	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	LIFICATION CATEGORY	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 L	ife
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
TV	Documentation Not Made Available	

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

LICENSEE RESPONSE TO NRC SER

Sheet	No.	EEB-10
Rev _	2	
Append	tix .	3
Sheet	1 01	F 1

The switches are required to operate in the following environment:

Temperature:

133°F

Atmospheric

Pressure: Relative Humidity: Radiation:

100%

10 year TID - 8.8 x 103 rads Accident - 1.0 x 104 rads

R2

The manufacturer's specifications for the switches are as follows:

Temperature:

160°F

Pressure:

Atmospheric

Pelative Humidity: NEMA 4 Enclosure Radiation:

Not Specified

The temperature and pressure environment in which the switches are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace these switches with a qualified replacement.

R2

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. __519/526

Page la

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

EQUIPMENT ITEM NO. 55

PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 1627

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 55

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): FAN MOTOR INTERLOCK (FS-30-184, 185, 190, 191, 192, 193)

SERVICE: FAN FLOW SWITCH

LICENSEE SUBMITTAL: SCEW(S): MEB-30-018RO (3.11-6 PAGE 1)

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

(R,T,QT, RT,P) H, CS (A, S, (R),M, I, (M) 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, 5 g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7c

SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has-not) provide	d a response to the SER concerns.
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is n exposed to the applicable DBE
The Licensee has presented informa outstanding qualification deficien	
The Licensee (has/has not) propose item whose qualification has not b	d a corrective action for this equipment een fully established.
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided by the em.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	
Equipment relocation above	submergence level
Relocate or shield equipme	nt from radiation source
	ditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e Other (quipment in progress
	r information for this equipment item is for justification for interim
	vided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualification ironmental qualification.
- CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON REVIEW f this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. <u>519</u>/526

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	M
		DESIGNATION:
NRC REC	QUIREMENTS	X = DEFICIENCY
Documen	nted Evidence of Qualification Adequate	shed X
Adequat	te Similarity Between Equipment and Test Specimen Establi	shed
Aging I	Degradation Evaluated Adequately	
Oualif	ied Life or Replacement Schedule Established (If Required)
Program	Established to Identify Aging Degradation	
Criter	ia Regarding Aging Simulation Satisfied (If Required)	-
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
Criteri	ia Regarding Spray Satisfied	-
	ia Regarding Submergence Satisfied	
Criteri	ia Regarding Radiation Satisfied	
	ia Regarding Test Sequence Satisfied	
Criter	ia Regarding Test Failures or Severe Anomalies	
(If)	Any) Satisfied	
	ia Regarding Functional Testing Satisfied	
Criter:	ia Regarding Instrument Accuracy Satisfied	
Test Du	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NDC OU	ALIFICATION CATEGORY	X = CATEGORY
NAC QUA	ALIFICATION CATEGORI	<u> </u>
I.a	Equipment Qualified	100
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 L	ife
	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. 53

LICENSEE RESPONSE TO NRC SER

Sheet No. MEB 30-013RO Appendix 2 RO

- F. W. Dwyer Differential Pressure Switch Models 1627-5
- a. The switches are qualified based on SNP-FSAR, paragraph 3.11.2.3. Although the qualification does not meet all of the requirements of IEEE 323-1971, section 5.3, "Operating Data," operating experience is used to justify their use.
 - The switches are used to automatically start backup fan motors for the lower compartment cooling units.

The switches are required to operate in the following environment:

Temperature: 1150 F

Pressure: Atmospheric

Relative Humidity: 100 percent

Radiation: 103 rads

 The manufacturer's specifications for the switches are as follows (see attachment 1):

Tamperature: 130° P

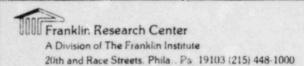
Pressure: Atmospheric

Relative Humidity: Not Specified

Rediation: Not Specified

- 3. All environmental specifications are verified by operating experience.
- 4. Ine Saquoyah operating environment is well within the manufacturer's sacreard operating conditions.

Prepared by	E. Blockburg
Reviewed by:	12 Doll
QA Acceptance	· · · · · · · · · · · · · · · · · · ·



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[1] 1 : [1] 1 : [1] 1 : [1] 1 : [1] 1 : [1] 1 : [1] 1 : [1] 1 : [1] 1 : [1] 1 : [1] 1 : [1] 1 : [1] 1 : [1] 1 [1] 1 : [1] 1
NOTES:
The licensee has states that The equipment is required to
operate in an invisionment of 115%. Lable 3.11-6 p.1
Shows that The Device is freated in held node 17. The
preise supplied profile for This area shows a peak
temperature of 202°F and table 3.11-2A shows a
radiation dose of > 107 rals for all areas except The
Board Rooms. The Piceise has not waluated The effects
of These extreme conditions on the equipment.
The begins has not Dan del and quelilistic i lantin
The Justice has not provided any qualification information
for this denice other Than to compare abnormal
Condition to manufactures specifications.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

EQUIPMENT ITEM NO. 56

FLOW SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 1627

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 56

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PIPE AND PENETRATION ROOM FAN INTERLOCK (FS-30-201)

SERVICE: VENTILATION AIR FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1043 (3.11-7 PAGE 17, 3.11-8 PAGE 32)

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

RATOR RT. PH CS, A S, (R), M I, OM RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 4e, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f , 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

72, 7h, 7c

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FRC Task No. 5/9/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	ded a response to the SER concerns.
	fically stated that the equipment is nen exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/hea net) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Y Justification for interim open Licensee for this equipment in the sequipment in	eration (has/has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment replacement wit Equipment modification Equipment relocation abov	
	ent from radiation source dditional (testing/analysis)
Qualification testing of Other (equipment in progress
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW
I.a Qualified	II.c Qualified Life Deficiency
	III.a Exempt
	IV Documentation Not Available
and/or should be exempted from en	ATION EVALUATION CATEGORY BASED ON REVISOR this TER for Legend) II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

		DESIGNATION:
NRC REC	UIREMENTS	X = DEFICIENCY
Documer	ated Evidence of Qualification Adequate	_X_
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished
Aging I	Degradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (If Require	(d)
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
0	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	-
0	Steam Exposure (If Required) Adequate	
Criteri	a Regarding Spray Satisfied	
Criter	ia Regarding Submergence Satisfied	
Criteri	a Regarding Radiation Satisfied	
Criter	ia Regarding Test Sequence Satisfied	
Criter	ia Regarding Test Failures or Severe Anomalies	
(If A	Any) Satisfied	
Criter	a Regarding Functional Testing Satisfied	
Criter:	ia Regarding Instrument Accuracy Satisfied	
Test D	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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	
TIT.D		W

Documentation Not Made Available

IV

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13. FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB-1043 Revision 1 Appendix 3 Sheet 1 of 1

The flow switch is required to operate in the following environment:

Temperature:

1100 F

Pressure:

Relative Humidity:

Atmospheric 100%

Radiation:

20 years TID -1.76 x 104 rads Accident -1.0 x 104 rads

RI

The manufacturer's specifications for the flow switch are as follows:

Temperature:

1300F

Pressure:

Atmospheric

Celative Humidity: Not Specified Radiation:

Not Specified

The temperature and pressure environment in which the switch is located is iess severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

R1

The above information provides adequate justification for continued operation. Hawaver, due to the lack of qualification documentation additional testing is taing performed by Wyle Laboratories.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

EQUIPMENT ITEM NO. 57

FLOW SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 1627

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 57

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PIPE AND PENETRATION ROOM COOLERS FAN (FS-30-186, 187)

SERVICE: FAN FLOW SWITCH

LICENSEE SUBMITTAL: SCEW(S): EEB-1015 (3.11-7 PAGE 17, 3.11-8 PAGE 30)

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

(OT) RT, (P) H) CS (R), 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	la
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, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f , 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation	607-60

Equipment Summary

Maintenance and Replacement Schedule Summary

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/hes not) provide	22d a response to the SER concerns.
	fically stated that the equipment is nen exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
★ The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
_X Justification for interim cpe Licensee for this equipment i	eration (has/has not) been provided by the tem.
X Corrective action specified b	by the Licensee:
Equipment replacement wit Equipment modification Equipment relocation abov	
Relocate or shield equipm	ent from radiation source
X Verify qualification by a Equipment relocation to a	
Qualification testing of Other (
The Licensee has provided other that can be construed as a bar operation.	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equi	pment item does not require qualification
and/or should be exempted from en	vironmental qualification.
ESIGNATION OF RESULTANT NRC QUALIFICATION 3 (See Section 3)	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
Y - Ourlified	
I.a Qualified I.b Modification/	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established	
II.b Not Qualified	IV Documentation Not Available

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. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REC	UIREMENTS		DESIGNATION: = DEFICIENCY
	to a Post done	of Qualification Adequate	
Documen	ted Evidence	ce of Qualification Adequate ty Between Equipment and Test Specimen Establis	
Adequat	e Similario	Evaluated Adequately	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Aging L	regradation or	Replacement Schedule Established (If Required)	
Qualiti	ed Life of	ed to Identify Aging Degradation	Mark Market Prints
Critori	- Begarding	g Aging Simulation Satisfied (If Required)	
Criteri	a Regarding	Temperature/Pressure Exposure:	
		rature Adequate	
	Control National Control of the Cont	ure Adequate	-
	Duration Ac		
		rofile Enveloped Adequately	-
		sure (If Required) Adequate	
		g Spray Satisfied	
		g Submergence Satisfied	
		g Radiation Satisfied	
		g Test Sequence Satisfied	
		g Test Failures or Severe Anomalies	
	Any) Satisf		
		g Functional Testing Satisfied	
Criteri	ia Regarding	g Instrument Accuracy Satisfied	
Toot Di	ration Marc	gin (1 hour + Function Time) Satisfied	
Critor	ia Pegardin	g Margins Satisfied (NUREG-0588, Cat. I)	
CITCEL	ia negatorii	y halyins sacistica (notae vice) care in	
			DESIGNATION:
NRC QUA	ALIFICATION	CATEGORY	X = CATEGORY
I.a		Qualified	
I.b		Qualification Pending Modification	×
II.a		Qualification Not Established	
II.b	Equipment	Not Qualified	
II.c		Satisfies All Requirements Except Qualified L	ife
		ement Schedule Justified	
III.a		Exempt From Qualification	
III.b		Not in the Scope of the Qualification Review	-
IV	Documenta	tion Not Made Available	

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB-1015 Revision 2 Appendix 3 Sheet 1 of 1

The switches are required to operate in the following environment:

Temperature: 126° F Pressure: Atmospheric Relative Humidity: 100%

Radiation: 20 years TID - 1.76 x 10⁴ rads Accident - 1 x 10⁴ rads

R2

The manufacturer's specifications for the switches are as follows:

· Temperature: 1300 F Pressure: Atmospheric

Relative Humidity: Not Specified Radiation: Not Specified

The temperature and pressure environment in which the switches are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

R2

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

EQUIPMENT ITEM NO. 58

PRESSURE SWITCH LOCATED IN THE ANNULUS

BARTON MODEL 288A

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 58

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT-ANNULUS PRESSURE (PS-30 -46A, B, 47A, B,

48A, B)

SERVICE: CONTAINMENT/ANNULUS DIFFERENTIAL PRESSURE LICENSEE SUBMITTAL: SCEW(S): EEB-1027 (3.11-5 PAGE 2)

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

R, T, OT, 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	la
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, 4£
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 - 7a

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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SUMM	ARY OF LICENSEE RESPONSES TO THE M	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
<u>x</u>	The Licensee (has/h as no t) provide	ed a response to the SER concerns.
-	The Licensee (has/has not) specificulation who environmental service conditions.	cally stated that the equipment is an exposed to the applicable DBE
-	The Licensee has presented information deficient	
-	The Licensee (has/hae not) propose tem whose qualification has not be	d a corrective action for this equipment een fully established.
	✓ Justification for interim oper Licensee for this equipment it	ation (has/h as not) been provided by the em.
	X Corrective action specified by	the Licensee:
	Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e	submergence level nt from radiation source ditional (testing/analysis) mild environment
-		r information for this equipment item is for justification for interim
-		vided a schedule for the proposed for accomplishing the corrective
a	nd/or should be exempted from env	
-	NATION OF RESULTANT NRC QUALIFICA CLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON REVIEW f this TER for Legend)
I.b II.a	Qualified Modification Qualification Not Established Not Qualified	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope IV Documentation Not Available

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Sh and Race Streets, Phila. Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118
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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	RM
NRC REC	UIREMENTS	DESIGNATION: X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	ished
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished
Aging D	egradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (If Require	(d)
Program	Established to Identify Aging Degradation	
	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	**Commention**
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criter	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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 Revie	w
IV	Documentation Not Made Available	-

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13/ FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

LICENSEE RESPONSE TO NRC SER

Sheet No.	EEB-1027
Revision	2
Appendix	3
Sheet 1 of	f 1

The switches are required to operate in the following environment:

Temperature:

150°F

Pressure:

Atmospheric

Relative Humidity:

Radiation:

30-80% (100% peak) 10 years TID = 5.0 x 10⁶ rads Accident - 5.0 x 10⁷ rads

R2

The manufacturer's specifications for the switches are as follows:

Temper@ture:

200°F

Pressure:

Atmospheric

Ralative Humidity: Mot Specified Radiation: 2 x 10 rads

Material breakdown analysis reveals the presence of switches, wires, and O-rings. These compogents have been replaced with new parts that have been tested to 2×10^6 rads without any damaging effect to their operation. Reference letter from ITT Barton (EEB 801204 034) to F. W. Chandler:

R2

The required temperature, pressure and radiation are well within the manufacturer's specifications. See generic position 4.1.8 for relative humidity.

The above information provides adequate justification for continued operation. Hursver, due to the lack of qualification documentation TVA will replace these switches with a qualified replacement.

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FRC Assignment No. 13
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

EQUIPMENT ITEM NO. 59

PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 1627

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 59

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): FLOW SWITCH - FAN INTERLOCK (FS-30-146, 157, 194, 195,

196, 197, 200, 202, 207)

SERVICE: FAN FLOW SWITCH

LICENSEE SUBMITTAL: SCEW(S): MEB-30-017RO (3.11-7 PAGE 1, 3.11-8 PAGE 6)

EEB-1020

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

(R,T) (T) RT, (CH) CS, (A) S, (R), (M) I (M) RPN, EXN, SEN, (QI)

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4e, 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

72, 7h, 7c

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SUMM	ARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
×	The Licensee (has/h as no t) provid	ded a response to the SER concerns.
-		fically stated that the equipment is nen exposed to the applicable DBE
-	The Licensee has presented informoutstanding qualification deficie	
	The Licensee (has/hasest) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	★ Justification for interim open Licensee for this equipment in Licensee for this equip	eration (has/h as net) been provided by the item.
	Corrective action specified b	by the Licensee:
	Equipment replacement wit	ch qualified equipment
	Equipment relocation above	re submergence level
	Relocate or shield equipm	ment from radiation source
	X Verify qualification by a	dditional (testing/analysis)
	Equipment relocation to a	
	Qualification testing of	equipment in progress
	Other ()
-		er information for this equipment item sis for justification for interim
		ovided a schedule for the proposed for accomplishing the corrective
		pment item does not require qualification
a	nd/or should be exempted from en	vironmental qualification.
DEST	NATION OF DECIL TANT NEC OUR LET	ATTION PUBLISHED CATECORY DACED ON DEUTEN
	CLED ITEM ONLY: (See Section 3	of this TER for Legend)
	analified.	TT = 0001/6/-4 T/6 D-6/-/
	Qualified Modification/	II.c Qualified Life Deficiency
	Qualification Not Established	III.a Exempt
	Not Qualified	IV Documentation Not Available
22.0	Mor Magriffed	bodulencation Not Available

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. 5/9/52/6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
		DESIGNATION:
NRC REC	UIREMENTS	X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Estab	lished
Aging D	Degradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (if Require	ed)
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	-
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	ia Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteri	ia Regarding Test Sequence Satisfied	
	la Regarding Test Failures or Severe Anomalies	
(If A	Any) Satisfied	-
Criteri	a Regarding Functional Testing Satisfied	-
Criteri	ia Regarding Instrument Accuracy Satisfied	
Test Du	uration Margin (1 hour + Function Time) Satisfied	
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
		X = CATEGORY
NRC QUA	ALIFICATION CATEGORY	A = CATEGORI
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 Revie	W
TV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

LICENSEE RESPONSE TO NRC SER

Sheet No. NEB 30-017 30 Appendix 2 RO

- F. W. Dwyer Differential Pressure Switch Models 1627-5
- a. The switches are qualified based on SNP-FSAR, paragraph 3.11.2.3. Although the qualification does not meet all of the requirements of IEEE 223-1971, section 5.3, "Operating Data," operating experience is used to justify their use.
 - The switches are used to automatically start backup fan motors for the control rod drive cooling units.

The switches are required to operate in the following environment:

Temperatura: 115° F

Pressure: Atmospheric

Relative Humidity: 90 percent

Radiation: 10 rads

 The manufacturer's specifications for the switches are as follows (see attachment 1):

Temperature: 130° F

Pressure: Atmospheric

Relative Humidity: Not Specified

Radiation: Not Specified

- All environmental specifications except radiation are verified by operating experience.
- 4. The operating conditions to which the switches will be subjected are well within the manufacturer's standard operating conditions in all areas except radiation.

The switches have Buna-N diaphragm. Buna-N is generally considered to begin significant physical property deterioration after 10° rads. However, since the radiation level will not exceed 10° rads, radiation will not adversely affect these switches.

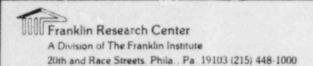
The disphragm will be inspected during routine maintenance and replaced as necessary.

- This model of switch is a standard model from the manufacturer's or 1 log and has been used in various industries for a number of years.
- The Sequeysh operating environment is well within the manufacturer's standard operating conditions.

Reviewed by: S. Blackbrum.

QA Acceptance:

NOTES:	
The freezee &	exercise date per Jeet 323-1971 sec. 5.3.
Ly operating	experience date per Jeet 323-1971 su .5.3.
Section 5,3	ctates:
	- 5.3 Operating Experience Data. Operating ex-
	perience data used to demonstrate the quali-
	fications of equipment shall be pertinent to
APACHMAN A MANAGEMENT	the application and organized in an auditable
	The operating experience data shall con-
	tain:
	5.3.1 Specifications for the equipment to be
	5.3.2 The specifications of equipment for
	which operating experience is available.
	to be demonstrated by operating experience.
	5.3.4 Comparison of past application and
	specifications with the new equipment specifi-
-	— cations for each feature identified above.
	5.3.5 Summary and source of operating ex- perience applicable to equipment quali-
	fication.
	5.3.6 The basis on which the data have
	been determined to be suitable.
	has not previded any late in operating expenses
conditions vo	manufactures date. In allitin, Repressie
states That of	he Bura - N linghage has a radiation exposure
acceptance of	106 rada hased in significant property attenuation
The ficense	has not intrified The property to which
This is again	iel, or The most critical physical property with
respect to ra	diation and The Thushold level for his property.



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FRC Task No. 5/9/526

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NOTES:
In addition, The premove has not addressed the
In addition The Junior has not addressed The effects of aging on The organic materials within The Service.
The Occise has stated in EEB - 1021 Rev. 2. That The Courses
The Judise has stated in EEB - 1021 Rev. 2, That The Senices would be qualified by additional analysis and testing.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

EQUIPMENT ITEM NO. 60

PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

CUSTOM COMPONENTS MODEL 604G

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 60

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONDENSATE STORAGE TANK HEADER PRESSURE (PS-3-148, 156,

164, 171)

SERVICE: STEAM GENERATOR LEVEL BYPASS

LICENSEE SUBMITTAL: SCEW(S): EEB-1031 (3.11-7 PAGE 18, 3.11-8 PAGE 20)

FUNCTION (PLANT ID): AUXILIARY FEED PUMPS OUTLET PRESSURE (PS-3-138A, 138B)

SERVICE: PUMP OUTLET PRESSURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1031 (3.11-6 PAGE 4, 3.11-8 PAGE 1)

FUNCTION (PLANT ID): CONDENSATE DEMINERALIZED WASTE EVAPORATOR BUILDING

SUPPLY (PS-70-209, 210)

SERVICE: DEMINERALIZED WASTES SUPPLY

LICENSEE SUBMITTAL: SCEW(S): EEB-1031 (3.11-6 PAGE 1, 3.11-8 PAGE 22)

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:

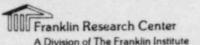
Checksheet Page No. Contents Equipment Item la Summary of Licensee Responses to the NRC SER 16 Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER 3a, 3b, 3c, 3d System Consideration Review 4a, 4b, 40, 4d, 4e, 4f 5a, 5b, 50, 5d, 5e, 5f; Equipment Environmental Qualification Review 5 , 5h, 5i, 5j Installed TMI Lessons Learned Implementation 6a, 6b

Equipment Summary

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

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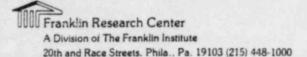
SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provided	d a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented information outstanding qualification deficience	
X The Licensee (has/has not) proposed item whose qualification has not be	d a corrective action for this equipment een fully established.
Y Justification for interim operation Licensee for this equipment ite	ation (has/has_not) been provided by the em.
X Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipmen	nt from radiation source
Verify qualification by add	
Equipment relocation to a m	
Qualification testing of eq Other (uipment in progress
	information for this equipment item s for justification for interim
The Licensee (has not) provocorrective action. (Schedule faction	or accomplishing the corrective
The Licensee states that the equipm and/or should be exempted from envi	ent item does not require qualification ronmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICAT	ION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	
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 SU	MMARY FORM
	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
Documented Evidence of Qualification Adequate	n EstablishedX
Adequate Similarity Between Equipment and Test Specime	n Established
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If	Required)
Program Established to Identify Aging Dagradation	
Criteria Regarding Aging Simulation Satisfied (If Requ	ired)
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) Satisfie	ed
Criteria Regarding Margins Satisfied (NUMEG-0588, Cat.	· 1)
	DESIGNATION:
NDG CHALLETGAMION CAMECODY	X = CATEGORY
NRC QUALIFICATION CATEGORY	A - CHIBOOKI
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 Qu	ualified Life
or Replacement Schedule Justified	
III.a Equipment Exempt From Qualification	
III.b Equipment Not in the Scope of the Qualification	on Review
IV Documentation Not Made Available	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

LICENSEE RESPONSE TO NRC SER

T 10	EE3 1031
Revision	1
Appendix	3
and the same	

. Sheet 1 of 1

The switches are required to operate in the following environment:

Temperature: 133°F
Pressure: Atmospheric
Relative Humidity: 100°%

Radiation: 40 years TID - 3.51₄x 10² rads Accident - 1.0 x 10⁴ rads

The manufacturer's specifications for the switches are as follows:

Temperature: 160°F
Pressure: Atmospheric
Relative Humidity: Not Specified
Radiation: Not Specified

The temperature and pressure environment in which the switches are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace these switches with a qualified replacement.

R1

RI

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6/

EQUIPMENT ITEM NO. 61

DIFFERENTIAL PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 693'

BAILEY MODEL 555

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 61

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY FEEDWATER PUMPS FLOW TRANSMITTER (FT-3-142)

SERVICE: AUXILIARY FEEDWATER FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1032 (3.11-6 PAGE 5, 3.11-8 PAGE 1)

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

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

Not stated, Not applicable

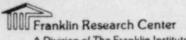
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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

RRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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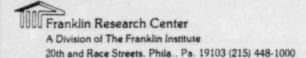
UMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICAB
The Licensee (has/has-not) provi	ded a response to the SER concerns.
	fically stated that the equipment is hen exposed to the applicable DBE .
The Licensee has presented informulation outstanding qualification deficit	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	eration (has/ $\frac{has-no}{}$) been provided by the item.
X Corrective action specified	by the Licensee:
Equipment replacement with Equipment modification	th qualified equipment
Equipment relocation above	ve submergence level
	ment from radiation source
	additional (testing/analysis)
Equipment relocation to a	
Qualification testing of	equipment in progress
Other ()
	ner information for this equipment item asis for justification for interim
	covided a schedule for the proposed for accomplishing the corrective
action (Schedule	tor accomprishing the corrective
	*/
The Licensee states that the equi	pment item does not require qualification vironmental qualification.
	CATION EVALUATION CATEGORY BASED ON REVIEW
CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
a Qualified	II a Qualified life Definions
Modification	II.c Qualified Life Deficiency III.a Exempt
a Qualification Not Established	
b Not Qualified	III.b Not in Scope IV Documentation Not Available



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DESIGNATION: X = DEFICIENCY Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aginy Degradation Evaluated Adequately 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 Peak Pressure Adequate O Bequired Profile Enveloped Adequately O Steam Exposure (If Required) Adequate Criteria Regarding Submergence Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: X = CATEGORY I.a Equipment Qualification Pending Modification III.a Equipment Not Qualified 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 Exempt From Qualification III.b Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review DV Documentation Not Made Available		EQUIPMENT	ENVIRONMENTAL QUALIFICATION SU	MMARY FORM	
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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 Instrument Accuracy Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Margins Satisfied Criteria Regarding Margins Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: NRC QUALIFICATION CATEGORY I.a Equipment Qualified I.b Equipment Qualification Pending Modification II.a Equipment Qualification Not Established II.b Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified III.b Equipment Exempt From Qualification III.b Equipment Exempt From Qualification III.b Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	Aging L	ed life or Poplar	sement Schedule Established (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 Spray Satisfied Criteria Regarding Submergence Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Instrument Accuracy Satisfied Criteria Regarding Margins Satisfied Criteria Regarding Margins Satisfied Criteria Regarding Margins Satisfied Criteria Regarding Nour + Function Time) Satisfied Criteria Regarding Margins Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: NRC QUALIFICATION CATEGORY I.a Equipment Qualified I.b Equipment Qualification Pending Modification II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life Or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review				quittou,	
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or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	II.c			ualified Life	
III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review					
III.b Equipment Not in the Scope of the Qualification Review	III.a				
	III.b			on Review	-
	IV				



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No.,13 FRC Task No. _5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6/

LICENSEE RESPONSE TO NRC SER

Sheet No.	EEB	1032	
Revision _		1	
Appendix _		3	1.
Sheet 1 of	,		

The transmitter is required to operate in the following environment:

Temperature: Pressure: . Relative humidity: 30-80% (100% peak)

2130 F Spike Atmospheric

Radiation:

40 year TID - 3.51 x 102 rads Accident - 1.0 x 104 rads

R1

The manufacturer's specifications for the transmitter are as follows:

Temperature: Pressure:

-200 F to 1850 F Atmospheric

Relative Humidity: Not Specified Radiation: Not Specified

The temperature spike $(213^{\circ}F)$ is back within the manufacturer's specification $(185^{\circ}F)$ in a approximately 20 seconds and down to $124^{\circ}F$ within 30 seconds. Therefore, the temperature spike should not affect the transmitters operation. The pressure is within the manufacturer's specifications. See generic positions R1 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace this transmitter with a qualified replacement.

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. 519/52/

Page la

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ITEM NO. 62

D/P TRANSMITTER LOCATED IN THE AUXILIARY BUILDING

FOXBORO MODEL E13DL

REQUIRED OF ERATING TIME: 1 YEAR

TER CHECKSHEET NO. 62

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT/ANNULUS DIFFERENTIAL PRESSURE (PDT-65-80,

82, 90, 97)

SERVICE: CONTAINMENT/ANNULUS PRESSURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1008 (3.11-7 PAGE 18, 3.11-8 PAGE 6)

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

R. PHH, 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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3e, 3d
System Consideration Review	40, 40, 40, 4d, 40, 4£
Equipment Environmental Qualification Review	5a, 5b, 5e, 5d, 5e, 5f , 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation	6ay 6b

Equipment Summary

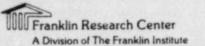
Maintenance and Replacement Schedule Summary

72, 7b, 7c

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 443-1000 NRC Centract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ____519/526__

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MMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provi	ded a response to the SER concerns.
	fically stated that the equipment is
qualified and/or will function w	hen exposed to the applicable DBE
environmental service conditions	
_ The Licensee has presented infor	mation which shows there are no
outstanding qualification defici	
	sed a corrective action for this equipment
item whose qualification has not	been fully established.
★ Justification for interim op	eration (has/has not) been provided by the
Licensee for this equipment	
X Corrective action specified	by the Licensee:
X Equipment replacement wi	th qualified equipment
Equipment modification	
Equipment relocation above	ve submergence level
Relocate or shield equip	
	additional (testing/analysis)
Equipment relocation to	
Qualification testing of	
Other ()
The Licensee has provided of	her information for this equipment item
	asis for justification for interim
operation.	asis for justification for interim
operation.	
X The Licensee (has /pas not) or	rovided a schedule for the proposed
	e for accomplishing the corrective
action	tor accomprishing the corrective
4002011	
The Licensee states that the agui	ipment item does not require qualification
and/or should be exempted from er	
and, or another so enompted from ci	Transmittat quartitude 2011.
	CATION EVALUATION CATEGORY BASED ON REVIEW
SIGNATION OF RESULTANT NRC QUALIFIC	
SIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3	
CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
CIRCLED ITEM ONLY: (See Section 3 a Qualified	of this TER for Legend) II.c Qualified Life Deficiency
CIRCLED ITEM ONLY: (See Section 3 a Qualified b Modification)	of this TER for Legend) II.c Qualified Life Deficiency III.a Exempt
CIRCLED ITEM ONLY: (See Section 3 a Qualified	of this TER for Legend) II.c Qualified Life Deficiency



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. 5/9/526

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	DRM
		DESIGNATION:
NRC REQ	UIREMENTS	X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	_x_
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished
Aging D	egradation Evaluated Adequitely	
Qualifi	ed Life or Replacement Schedule Established (If Require	ed)
Program	Established to Identify Aging Degradation	
	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
2	Peak Temperature Adequate	
0	Peak Pressure Adequate	-
	Duration Adequate	-
	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	-
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	any) Satisfied	-
	a Regarding Functional Testing Satisfied	-
Criteri	a Regarding Instrument Accuracy Satisfied	W/S-manufacture
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	la Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NPC OU	ALIFICATION CATEGORY	X = CATEGORY
MAC QUA	THE TON CREDON	
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 Revie	W
IV	Documentation Not Made Available	-

Page 3a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

LICENSEE RESPONSE TO NRC SER

Sheet	No.	EEB	1003	
Revis	ion .		2	_
Append	iix .		3	_
Stoot	1	of	1	

The transmitters are required to operate in the following environment:

Temperature:

1330F

Pressure:

Atmospheric

Relative Humidity:

30-80% (100% peak)

Radiation:

10 year TID - 8.8 x 103 rads Accident - 1 x 104 rads

R7

The manufacturer's specifications for the switches are as follows:

Temperature:

180°F

Pressure:

Atmospheric

Relative Humidity: NEMA 4 Enclosure Radiation:

Not Specified.

The temperature and pressure environment in which the transmitters are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

R2

The above information provides adequate justification for continued operation. Nowever, due to the lack of qualification documentation TVA will replace these transmitters with a qualified replacement.

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 5/9/526

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EQUIPMENT EN' RONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

EQUIPMENT ITEM NO. 63

D/P TRANSMITTER LOCATED IN THE AUXILIARY BUILDING

BAILEY MODEL 555

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 63

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): THERMAL BARRIER HEADER FLOW (FT-70-81A, B, D)

SERVICE: THERMAL BARRIER FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1004 (3.11-7 PAGE 6, 3.11-8 PAGE 6, 31) FUNCTION (PLANT ID): THERMAL ROOM BARRIER SUPPLY HEADER FLOW (FT-70-81E)

SERVICE: SUPPLY HEADER FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1004 (3.11-7 PAGE 16, 3.11-8 PAGE 28)

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









Maintenance and Replacement Schedule Summary





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



Not stated, Not applicable

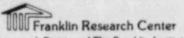
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Summary of Licensee Responses to the NRC SER	1b
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Licensee Response to NRC SER	3a, 3b, 3e, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4c, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5£ , 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

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. 5/9/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
▼ The Licensee (has/hes not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	
The Licensee has presented information outstanding qualification deficient	
X The Licensee (has/has not) propose item whose qualification has not it	ed a corrective action for this equipment been fully established.
X Justification for interim open Licensee for this equipment is	ration (has/ has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Fquipment relocation above Relocate or shield equipme Verify qualification by acceptance of the second control of the second c	e submergence level ent from radiation source dditional (testing/analysis) mild environment
)
	er information for this equipment item sis for justification for interim
corrective action. (Schedule	for accomplishing the corrective
	pment item does not require qualification
and/or should be exempted from env	vironmental qualification.
CONTRACTOR OF THE PROPERTY OF	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification/	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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NRC Contract No. NRC-03-79-118
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FRC Task No. 5/9/526

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	DRM
NRC REC	QUIREMENTS	DESIGNATION: X = DEFICIENCY
THE THE		
	ted Evidence of Qualification Adequate	X
	e Similarity Between Equipment and Test Specimen Establ	ished
Aging I	Degradation Evaluated Adequately	-
	ed Life or Replacement Schedula Established (If Raquire	ed)
	Established to Identify Aging Degradation	
	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	-
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	-
	ia Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	-
	ia Regarding Test Sequence Satisfied	
	ia Regarding Test Failures or Severe Anomalies Any) Satisfied	
Criter	a Regarding Functional Testing Satisfied	
Criter:	ia Regarding Instrument Accuracy Satisfied	
	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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 or Replacement Schedule Justified	Life
III.a	Equipment Exempt From Qualification	-
III.b	Equipment Not in the Scope of the Qualification Revie	w
IV	Documentation Not Made Available	

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

LICENSEE RESPONSE TO NRC SER

Sheet No.	EEB	1004	
Rev.		3	
Appendix	1	3	
Sheet 1	of	1	

The transmitters are required to operate in the following environment:

Temperature: 1330 F

Pressure: Atmospheric

Relative Humidity: 30-80% (100% peak)

Radiation: 10 year TID - 0.84x 104 rads Accident - 1 x 104 rads

R3

The manufacturer's specifications for the transmitters are as follows:

Temperature: -200 F to 1850 F

Prossure: Atmospheric

Relative Humidity: Not Specified*

Radiation: Not Specified

*Rated for all outdoor installation.

The temperature and pressure environment %% which the transmitters are located is less severe than the manufacturers specifications. See generic R3 positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will replace the devices R3 with qualified transmitters.

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

EQUIPMENT ITEM NO. 64

FLOW TRANSMITTER LOCATED IN THE AUXILIARY BUILDING

BAILEY MODEL 555

REQUIRED OPERATING TIME: 1 MONTH

TER CHECKSHEET NO. 64

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT SPRAY HEADER A&B FLOW (FT-72-13, 34)

SERVICE: CONTAINMENT SPRAY FLOW

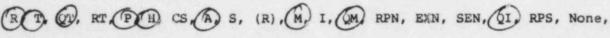
LICENSEE SUBMITTAL: SCEW(S): EEB-1034 (3.11-7 PAGE 15)

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













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	ta, 40, 40, 4d, te, If
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 3f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation	6a, 6b

Equipment Summary

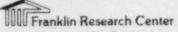
Ja, 10, 7c

Maintenance and Replacement Schedule Summary

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
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FRC Task No. 519 526

Page 1b

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has hot) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when the environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficient	
The Licensee (has/hammet) proposed item whose qualification has not be	ed a corrective action for this equipment been fully established.
	ration (has/h as not) been provided by the tem.
X Corrective action specified by	y the Licensee:
X Equipment replacement with Equipment modification	n qualified equipment
Equipment relocation above	e submergence level
Relocate or shield equipme	ent from radiation source
Verify qualification by ac	dditional (testing/analysis)
Equipment relocation to a	mild environment
Qualification testing of a Other (equipment in progress
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
action within 5 years	
The Licensee states that the equipand/or should be exempted from envi	oment item does not require qualification vironmental qualification.
DESTONATION OF PEGIL TAND NEC OUR LET CE	ATTON PUBLISHED CAMPCODY DACED ON DEVILOR
- CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification/	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



IV

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY I	FORM
		DESIGNATION:
NRC REQUIE	REMENTS	X = DEFICIENCY
Documented	d Evidence of Qualification Adequate	X
	Similarity Between Equipment and Test Specimen Estal	olished
Aging Degr	radation Evaluated Adequately	
	Life or Replacement Schedule Established (If Requi	red)
Program Es	stablished to Identify Aging Degradation	-
Criteria F	Regarding Aging Simulation Satisfied (If Required)	-
	Regarding Temperature/Pressure Exposure:	
o Pea	ak Temperature Adequate	
	ak Pressure Adequate	committee and co
	ration Adequate	
	quired Profile Enveloped Adequately	************
o Ste	eam Exposure (If Required) Adequate	
Criteria I	Regarding Spray Satisfied	
Criteria I	Regarding Submergence Satisfied	
	Regarding Radiation Satisfied	
	Regarding Test Sequence Satisfied	
	Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied	
Criteria I	Regarding Functional Testing Satisfied	
	Regarding Instrument Accuracy Satisfied	
Test Dura	tion Margin (1 hour + Function Time) Satisfied	
Criteria 1	Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUALI	FICATION CATEGORY	X = CATEGORY
	quipment Qualified	
	quipment Qualification Pending Modification	X
II.a E	quipment Qualification Not Established	
	quipment Not Qualified	-
II.c E	quipment Satisfies All Requirements Except Qualifie	ed Life
	r Replacement Schedule Justified	
	quipment Exempt From Qualification	statistics.
III.b E	quipment Not in the Scope of the Qualification Revi	lew

Documentation Not Made Available

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

LICENSEE RESPONSE TO NRC SER

Sheet No.	EEB-1034
Revision	1
Appendix	3
Sheet 1 of	f_1

The transmitters are required to operate in the following environment:

Temperature: Pressure:

110°F

Atmospheric

Relative Humidity: 30-80% (100% peak)
Radiation: 5 year TID - 4.4 x 10⁴ rads
Accident - 1.0 x 10⁴ rads

RI

The manufacturer's specifications for the transmitters are as follows:

Temperature:

-20°F to 185°F

Pressure:

Atmospheric

Relative Humidity: Not Specified Radiation:

Not Specified

The temperature and pressure environment in which the transmitters are located is less severe than the manufacturer's specification. See generic position 4.1.8 for relative humidity.

Material breakdown analysis reveals the presence of electronic devices such as diodes and transistors. The theshold level of these devices, which is not a point of failure or end of useful life, is 1.0×10^4 . The total radiation dose including an accident dose is 5.4×10^4 , which is less than an order of magnitude above the theshold. Devices of this type have been tested to higher than this level without failures.

The above information provides adequate justification for coninued operation. however, due to the lack of qualification documentation TVA will replace these tensmitters with a qualified replacement within 5 years.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

EQUIPMENT ITEM NO. 65

D/P TRANSMITTER LOCATED IN THE LOWER CONTAINMENT

BARTON MODEL 764 LOT 2

REQUIRED OPERATING TIME: 4 MONTHS

TER CHECKSHEET NO. 65

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM FLOW TRANSMITTER (FT-1-3A, B, 10A, B, 21A, B, 28A,

B)

SERVICE: STEAM FLOW

LICENSEE SUBMITTAL: SCEW(S): NEB-1-8 (3.11-4 PAGE 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	la	
Summary of Licensee Responses to the NRC SER	1b	
Equipment Environmental Qualification Summary Forms	2	
Licensee Response to NRC SER	3a, 3 b, 3e, 3d	
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f	
Equipment Environmental Qualification Review	Sa, Sb, Sc, Sd, Se , Sf, Sg, Sh, Si, Sj	
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b	

Maintenance and Replacement Schedule Summary

70, 70, 70

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 5/9/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
	ded a response to the SER concerns.
	fically stated that the equipment is non exposed to the applicable DRE
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided by the tem.
Corrective action specified b	by the Licensee:
Equipment replacement with	h qualified equipment
Equipment relocation abov	re submergence level
	ent from radiation source
	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of	
Other ()
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
action	·)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

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
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FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b

Documentation Not Made Available

IV

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

SHEET NO. NEB-1-8 REV. 2

APPENDIX 1 REV. 2

ENVIRONMENTAL ANALYSIS

INTRODUCTION:

The approach used to eastablish qualification for Barton (Lot 2) Transmitters combines type testing and partial analysis. Tests performed are described in Report No. NS-TMA-2184. The test sequence was assentially as follows. Radiation, Seismic Simulation Steam/Temperature/Pressure/Chemical Spray. At the end of these tests the component showed no degraded performance and were within accuracy reuirements.

AGING: Thermal aging was not specifically included in the program.

However, using Arrhenius methodology the fifteen day testing at
250 F is equivalent to one month at an average temperature of 160 F
with margin plus twelve months at 115 F with margin. This is based
very conservatively on an activation evergy of 0.5 eV.

If the 10 C rule is applied, results yield a service life of 3.0 years plus the DBE. A review of the materials used in the transmitters indicates that only '0' rings and insulation material are susceptible to thermal degradation within a 10 year period.

Margin: A comparison of environmental service conditions with test results indicated that adequate margin has been demonstrated as follows:

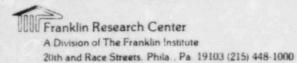
Parameter	Test	Required	Margin
Teap. F	370	327	43
Press. Psig	75	12,	63
Radiation Megarads	50	30	20

 Preliminary calculations for 40 year total integrated dose plus accident dose in the lower containment area outside the crane support wall. Reference TVA calculation TI-RPS-48.

Conclusion: On the basis of the above discussion, it is judged that the qualified life for these transmitters is a minimum of 5 years.

TVA Component No. Service Ref. Table 311
FT1-3A,B;10A,B;21A,B;28A,B Steam Flow Transmitters -4 Sheet 15

R2



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NOTES: The licensee has referenced Westinghouse Report NO. NS-TMA- 2184 as evidence of qualification for this languagement item. The report was not supplied with The hierse's submitted, Sheefne no enalustion can be performed.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

EQUIPMENT ITEM NO. 66

PRESSURE CONTROLLER LOCATED IN THE AUXILIARY BUILDING

JOHNSON CONTROLS MODEL PL-4000-2

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 66

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUX BLDG GAS TREATMENT FAN A-A & B-B (FC-30-148, 149)

SERVICE: FLOW CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-1047 (3.11-6 PAGE 18, 3.11-8 PAGE 24)

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, M, RPN, EXN, SEN, QI RPS, None,

Not stated, Not applicable

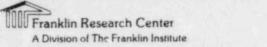
LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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

7a, 7b, 7c

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER -	ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has-net) provided a resp	onse to the SER concerns.
The Licensee (has/has not) specifically st qualified and/or will function when expose environmental service conditions.	
The Licensee has presented information whi outstanding qualification deficiencies.	ch shows there are no
X The Licensee (has/has not been full	
X Justification for interim operation (h Licensee for this equipment item.	as/hes not) been provided by the
∠ Corrective action specified by the Lic	ensee:
Equipment replacement with qualifi Equipment modification Equipment relocation above submerg Relocate or shield equipment from Verify qualification by additional Equipment relocation to a mild env Qualification testing of equipment Other (ence level radiation source (testing/analysis) ironment in progress
The Licensee has provided other inform that can be construed as a basis for j operation.	
The Licensee (has not) provided a corrective action. (Schedule for accoaction	
The Licensee states that the equipment ite and/or should be exempted from environment	
DESIGNATION OF RESULTANT NRC QUALIFICATION EVA - CIRCLED ITEM ONLY: (See Section 3 of this T	
II.a Qualification Not Established III.b	Qualified Life Deficiency Exempt Not in Scope Documentation Not Available



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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	<u>RM</u>
		DESIGNATION:
NRC REC	QUIREMENTS	X = DEFICIENCY
Documer	ated Evidence of Qualification Adequate	×
	e Similarity Between Equipment and Test Specimen Establ:	ished X
	Degradation Evaluated Adequately	
	led Life or Replacement Schedule Established (If Required	1)
	Established to Identify Aging Degradation	
	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied		
	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
2000	a Regarding Functional Testing Satisfied	
	a Regarding Instrument Accuracy Satisfied	
	ration Margin (1 hour + Function Time) Satisfied	
	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
CLICEL	a Regarding Margins Sacraffed (Monage 0500) Cac. 17	
		DESIGNATION:
NPC OIL	ALIFICATION CATEGORY	X = CATEGORY
HAC OUR	ILLI TON CATAGONI	1 00000000
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	All the second second
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. 66

LICENSEE RESPONSE TO NRC SER

Sheet No. EE3 1047 Revision 1 Appendix 3

Sheet 1 of 1

The pressure controllers are required to operate in the following environment:

Temperature: 115°F
Pressure: Atmospheric
Relative Humidity: 100%
Radiation: 40 year TID - 3.51x10³ rads
Accident - 1.0x10⁴ rads

RI

The manufacturer's specifications for the pressure controllers are as follows:

Temperature: 125°F
Pressure, Atmospheric
Relative numidity: Not specified
Radiation: Not Specified

The temperature and pressure environment in which the controllers are located is less severe than the manufacturer's specifications. See generic positions 4.1.3 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

EQUIPMENT ITEM NO. 67

SIGNAL CONVERTER LOCATED IN THE AUXILIARY BUILDING

TRANSMATION MODEL SW123-1T

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 67

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUX BLDG GAS TREATMENT FAN CONTROL (FM-30-148A, 149A)

SERVICE: FAN CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-1010 (3.11-6 PAGE 5, 3.11-8 PAGE 25)

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

RT, OT RT, PH 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 la

Summary of Licensee Responses to the NRC SER 1b

Equipment Environmental Qualification Review

Equipment Environmental Qualification Summary Forms 2

Licensee Response to NRC SER 3a, 3b, 3c, 3d

System Consideration Review 4a, 4b, 4c, 4d, 4e, 4f

5a, 5b, 50, 5d, 5e, 5f,

5g, 5h, 5i, 5j

Installed TMI Lessons Learned Implementation 6a, 6b
Equipment Summary

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

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - OF LY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/h as no t) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
★ The Licensee (has/has not) propositem whose qualification has not in the control of the c	ed a corrective action for this equipment been fully established.
	ration (has/ has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with	h qualified equipment
Equipment relocation above	e submergence level
Relocate or shield equipme	ent from radiation source
× Verify qualification by a	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of o	equipment in progress
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from one	pment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

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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		EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	RM
Ocumented Evidence of Qualification Adequate dequate Similarity Between Equipment and Test Specimen Established ging Degradation Evaluated Adequately ualified Life or Replacement Schedule Established (If Required) rogram Established to Identify Aging Degradation riteria Regarding Aging Simulation Satisfied (If Required) riteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Temperature Adequate o Peak Pressure Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied riteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied riteria Regarding Instrument Accuracy Satisfied rest Duration Margin (I hour + Function Time) Satisfied riteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION NEC QUALIFICATION CATEGORY I.a Equipment Qualified II.b Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified III.b Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review			
ging Degradation Evaluated Adequately ualified Life or Replacement Schedule Established (If Required) rogram Established to Identify Aging Degradation riteria Regarding Aging Simulation Satisfied (If Required) riteria 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 riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Test Sequence Satisfied riteria Regarding Test Sequence Satisfied riteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied riteria Regarding Instrument Accuracy Satisfied riteria Regarding Instrument Accuracy Satisfied riteria Regarding Margin (I hour + Function Time) Satisfied riteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION REC QUALIFICATION CATEGORY I.a Equipment Qualification Pending Modification III.a Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified II.c Equipment Exempt From Qualification III.a Equipment Exempt From Qualification III.b Equipment Exempt From Qualification III.b Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	NRC REQ	UIREMENTS	X - DEFICIENCE
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ualified Life or Replacement Schedule Established (If Required) rogram Established to Identify Aging Degradation riteria Regarding Aging Simulation Satisfied (If Required) riteria Regarding Temperature/Pressure Exposure: o Peak Temperature Adequate o Peak Pressure Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied riteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied riteria Regarding Functional Testing Satisfied riteria Regarding Instrument Accuracy Satisfied riteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION REC QUALIFICATION CATEGORY I.a Equipment Qualified II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified III.b Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	ging D	egradation Evaluated Adequately	
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III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review	11.0		
III.b Equipment Not in the Scope of the Qualification Review	TTT -		
			w
	IV IV		

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. __5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

LICENSEE RESPONSE TO NRC SER

Sheet No. EE3 1010

Revision 2

Appendix 3

Sheet 1 of 1

The converters are required to operate in the following environment:

Temperature: 115°F Pressure: Atmospheric Relative Humidity: 100%

Radiation: 40 year TID - 3.51x102 rads

Accident - 1.0x104 rads

R2

The manufacturer's specifications for the converters are as follows:

Temperature: 120°F Pressure: Atmospheric

Relative Humidity: Not Specified (NEMA 4 Enclosure) Radiation: Not Specified

R2

The temperature and pressure environment in which the converters are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

EQUIPMENT ITEM NO. 68

AIR DRYERS LOCATED IN THE AUXILIARY BUILDING

PALL TRINITY MODEL 101HA1-6HD9810-331

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 68

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): ESSENTIAL CONTROL AIR DRYERS A & B

SERVICE: CONTROL AIR DRYER

LICENSEE SUBMITTAL: SCEW(S): EEB-1005 (3.11-6 PAGE 22, 3.11-8 PAGE 25)

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

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LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4e, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5e, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	-6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7a

SUMMARY	OF LICENSEE RESPONSES TO THE NE	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The	Licensee (has/ has not) provided	d a response to the SER concerns.
qual		cally stated that the equipment is n exposed to the applicable DBE
-	Licensee has presented informat standing qualification deficience	
-	Licensee (has/has-not) proposed whose qualification has not be	d a corrective action for this equipment een fully established.
×	Justification for interim opera Licensee for this equipment ite	ation (has/ has no t) been provided by the em.
×	Corrective action specified by	the Licensee:
	Equipment replacement with Equipment modification	qualified equipment
	Equipment relocation above	submergence level
	Relocate or shield equipmen	nt from radiation source
	X Verify qualification by add	
	Equipment relocation to a m	
	Qualification testing of eq Other (quipment in progress
		r information for this equipment item is for justification for interim
		vided a schedule for the proposed for accomplishing the corrective
-	Licensee states that the equipm for should be exempted from envi	ment item does not require qualification ironmental qualification.
	TION OF RESULTANT NRC QUALIFICATED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON REVIEW f this TER for Legend)
I.a Qua		II.c Qualified Life Deficiency
	ification	III.a Exempt
	lification Not Established	III.b Not in Scope
II.b Not	Qualified	IV Documentation Not Available

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	<u>M</u>
		DESIGNATION:
NRC REQ	UIREMENTS	X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	_X_
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished
Aging D	egradation Evaluated Adequately	-
qualifi	ed Life or Replacement Schedule Established (If Require	d)
rogram	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
	Peak Pressure Adequate	-
	Duration Adequate	-
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	-
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	la Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NDC OU	ALIFICATION CATEGORY	X = CATEGORY
NAC QUA	ALIFICATION CATEGORI	
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	
TV	Documentation Not Made Available	

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB 1005 Revision 2 Appendix 3 Sheet 1 of 1

The dryers are required to operate in the following environment:

Temperature: 1150F Pressure: Atmospheric Relative Humidity: 100% Radiation: 40 year TID - 1.76x10³ rads Accident - 1.0x10⁴ rads

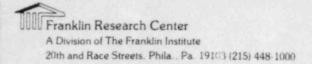
The manufacturer's specifications for the dryers are as follows:

Temperature: 120°F Pressure: Atmospheric Relative Humidity: 10-90% Radiation: Not Specified

The temperature and pressure environment in which the air dryers are located are less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing and analysis are being performed by Wyle Laboratories.

R2



NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 571/526

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

EQUIPMENT ITEM NO. 69

DISTRIBUTION PANEL, LOCATION NOT STATED

POWER ELECTRIC MODEL CCB

REQUIRED OPERATING TIME: 1 WEEK

TER CHECKSHEET NO. 69

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PRESSURIZER HEATER DISTRIBUTION PANEL (B/U-1A-A, 1B-B,

1C, 1D)

SERVICE: PRESSURIZER HEATER CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-0003 (3.11-6 PAGE 13)

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, WM RPN, EXN, SEN, QI RPS, None,

Not stated, Not applicable

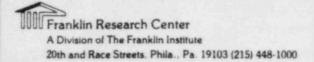
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4e, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 3f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a; 7b; 7e

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABL
X The Licensee (has/han-not) provided a response to the SER concerns.
The Licensee (has/hes/hot) 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/nas 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 III.a Qualification Not Established III.b Not in Scope III.b Not Qualified IV Documentation Not Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION	SUMMARI FORM
	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
and a Tailanna of Carliffention Magazine	
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Speci	men Established
Aging Degradation Evaluated Adequately	men astab@ished
Qualified Life or Replacement Schedule Established (If Required)
Program Established to Identify Aging Degradation	II hequired,
Criteria Regarding Aging Simulation Satisfied (If Re	quired)
	quired
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) Satisf	
Criteria Regarding Margins Satisfied (NUREG-0588, Ca	t. I)
	DESIGNATION:
NRC QUALIFICATION CATEGORY	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	Oualified Life
or Replacement Schedule Justified	
III.a Equipment Exempt From Qualification	
III.D Equipment Not in the Scope of the Qualificat	ion Review
IV Documentation Not Made Available	<u>×</u>
The license states that these gamels are g	qualified by similarity
to those tested under light no. 80GPCO. has not been made anailable for peniew	05, however, The pegist
has not been made anailable for remen	~ .



NRC Contract No. NRC-03-79-118
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FRC Assignment No. 13
FRC Task No. 5/9/526

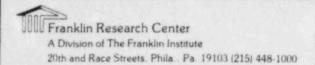
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

LICENSEE RESPONSE TO NRC SER

PRESSURIZER HEATER DISTRIBUTION PANEL QUALIFICATION

No specific environmental or aging tests were conducted on this acuir and however, the panels are qualified on the basis of similarity to other equipment which has been tested. These panels contain General Electric type TFJ molded case breakers. The breakers are similar in material and construction to the General Electric type TED and THED breakers qualified in Hartsville and Phipps Bend Nuclear Plant test report 8032C005 for motor control centers bought under TVA contract 77K5-820350. The environmental parameters to which the tested equipment are qualified exceed the requirements for the equipment at Sequoyah. This equipment was covered under NCR SQNEE88015 which can now be changed to clear this item. Therefore, this equipment is acceptable for continued safe operation.



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 5/9/526

Page la

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

EQUIPMENT ITEM NO. 70

TURBINE CONTROL PANEL LOCATED IN THE AUXILIARY BUILDING

TERRY MODEL GS-2

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 70

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUX FEED PUMP TURBINE CONTROL PANEL (PANEL-326, -381)

SERVICE: ELECTRO MECHANICAL TURBINE GOVERNOR CONTROL

LICENSEE SUBMITTAL: SCEW(S): MER-3-001R0 (3.11-6 PAGE 12)

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, EXM, SEN, QI RPS, None,



Not stated, Not applicable

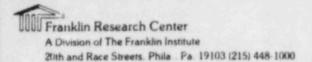
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 5c, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6 b

Maintenance and Replacement Schedule Summary

7a, 7b, 7c

SUMMARY OF LICENSEE RESPONSES TO THE I	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficien	
X The Licensee (has/harmot) propose item whose qualification has not have the control of the con	ed a corrective action for this equipment been fully established.
	ration (has/h ao not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with	n qualified equipment
Equipment relocation above	e submergence level
Relocate or shield equipme	ent from radiation source
Verify qualification by ac	dditional (testing/analysis)
Equipment relocation to a	
<pre>Qualification testing of e Other (</pre>	equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from environment	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF RESULTANT NRC QU	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

Page 2

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
		DESIGNATION:	
NRC REC	UIREMENTS	= DEFICIENCY	
Documen	ated Evidence of Qualification Adequate	_×_	
Adequat	e Similarity Between Equipment and Test Specimen Establish	ned	
Aging D	Degradation Evaluated Adequately	-	
	ed Life or Replacement Schedule Established (If Required)	-	
Program	Established to Identify Aging Degradation	-	
Criteri	a Regarding Aging Simulation Satisfied (If Required)		
	a Regarding Temperature/Pressure Exposure:		
	Peak Temperature Adequate		
	Peak Pressure Adequate		
	Duration Adequate	-	
	Required Profile Enveloped Adequately	-	
	Steam Exposure (If Required) Adequate	-	
	a Regarding Spray Satisfied		
	a Regarding Submergence Satisfied	-	
Criteri	a Regarding Radiation Satisfied	ner seeksteele	
Criteri	a Regarding Test Sequence Satisfied	-	
	a Regarding Test Pailures or Severe Anomalies		
	ny) Satisfied		
Criteri	a Regarding Functional Testing Satisfied	-	
Criteri	a Regarding Instrument Accuracy Satisfied	SALES SERVICES	
Test Du	ration Margin (1 hour + Function Time) Satisfied	-	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)		
		DESIGNATION:	
NRC OUA	LIFICATION CATEGORY	X = CATEGORY	
	Eqgipment Qualified		
I.a		-	
	Equipment Qualification Pending Modification	X	
I.b	Equipment Qualification Pending Modification Equipment Qualification Not Established	<u>X</u>	
I.b II.a	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified	_	
I.b II.a II.b	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life	_	
I.b II.a II.b	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified	_	
I.a I.b II.a II.b III.c	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified Equipment Exempt From Qualification	_	
I.b II.a II.b II.c	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified	_	

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13,
FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

LICENSEE RESPONSE TO NRC SER

Attachment 1

APPENDIX 2

Although the qualification does not meet all of the requirements of ISEE 323-1971, section 5.3, "Operating Data", operating experience is used to justify their use.

 The electrical control equipment is used to control the speed of the turbine-driven auxiliary feedwater pump.

This equipment is required to operate in the following environment:

Temperature: 125°F
Pressure: Atmospheric
Relative Humidity: 100%
Radiation: 10³ rads

2. The manufacturer's specifications for the electrical control equipment are as follows:

Enclosed control panel - temperature 120° F, and electrical components inside panel - temperature 150° F.

- 3. An environmental qualification test for the turbine-driven auxiliary feedwater pump (including the electrical control equipment) was recently completed at Sequoyah. During this test the pump was operated for approximately six hours with an ambient room temperature of 125°F. Temperatures inside the turbine control enclosures stabilized at levels below the maximum component design temperatures, and the turbine-maintained rated speed during the entire test. The radiation dose is negligible.
- 4. This model of controller is a standard model from the manufacturer's catalog and has been used in various industries for a number of years.
- 5. The Sequoyah operating environment is well within the manufacturer's standard operating conditions.
- Documentation for the environmental qualification of this equipment is expected on November 14, 1980.
- 7. The enclosed control panel was modified prior to the test in item 3 to provide additional ventilation to the electrical components inside the panel. The above test verified that the temperature of the electrical components inside the modified panel stabilized at temperatures below the maximum component design temperatures when a maximum ambient temperature of 1250 F outside the panel was applied.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7/

EQUIPMENT ITEM NO. 71

CONTROL PANEL LOCATED IN THE AUXILIARY BUILDING

INGERSOLL-RAND MODEL 7X4 ESV-1P-NL-2

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 71

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY CONTROL AIR CONTROL PANEL

SERVICE: COMPRESSOR CONTROL

LICENSEE SUBMITTAL: SCEW(S): MEB-32-001-RO (3.11-6 PAGE 4)

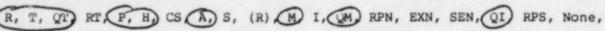
DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY: (See Section 3 of this TER for Legend)













Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents		Checksheet	Page No.
Equipment	Item	la	

Summary of Licensee Responses to the NRC SER 1b

Equipment Environmental Qualification Summary Forms

Licensee Response to NRC SER 3a, 3b, 3c, -2d-

System Consideration Review

Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

Page 1b

SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABL
X The Licensee (has/has not) provide	d a response to the SER concerns.
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is n exposed to the applicable DBE
The Licensee has presented informa outstanding qualification deficien	
Y The Licensee (has/has not) propose item whose qualification has not b	d a corrective action for this equipment een fully established.
X Justification for interim oper Licensee for this equipment it	ation (has/basent) been provided by the em.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme X Verify qualification by ad	submergence level nt from radiation source ditional (testing/analysis)
Equipment relocation to a Qualification testing of e Other (
	r information for this equipment item is for justification for interim
Y The Licensee (**) has not) pro corrective action. (Schedule action	vided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	ment item does not require qualification ironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON REVIEW f this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
		DESIGNATION:
NRC REC	UIREMENTS	K = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	_X_
	e Similarity Between Equipment and Test Specimen Establis	shed
Aging D	Degradation Evaluated Adequately	
	ed Life or Replacement Schedule Established (If Required)	
Program	Established to Identify Aging Degradation	-
Criteri	a Regarding Aging Simulation Satisfied (If Required)	-
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
	a Regarding Functional Testing Satisfied	-
Criteri	a Regarding Instrument Accuracy Satisfied	
	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NPC OUR	ALIFICATION CATEGORY	X = CATEGORY
ANC OUR	EDIFICATION CATEGORI	11 3111111111
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	×
II.a	Equipment Qualification Not Established	1000
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified L	ife
	or Replacement Schedule Justified	The second second
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7/

LICENSEE RESPONSE TO NRC SER

ME3 32-001 RO Appendix 2 Page 1 of 3

The Auxiliary air compresser control panel is located in an area with the following environmental conditions:

Temperature 104°F 115°F (104°F winter*)
Pressure Atmospheric Atmospheric Relative Humidity 98 percent 100 percent Radiation 5x10² Rads/40 yr** 1x10³ Rads/30 days**

*It has been judged that the temperature during the heating season will not exceed $1049\mathrm{F}$ for the accident environment.

**Radiation is considered negligable.

The auxiliary air compresser control panel consists of an enclosure containing equipment as follows (Refer to Ingersoll-Rand Drawing F-27524-DRI for device identification).

LOLR & HATR: Allen-Bradley Relay Bulletin 700 Type N
The manufacturers recommended maximum continuous operating conditions
are as listed below:

Temperature - 104°F
Pressure - Atmospheric
Relative Humidity - None
Radiation - None

realtive humidity is judged at a maximum of 100 percent noncondensing which is typical of a normal industrial application.

The relay has been idesigned and used in such typical industrial application without abnormal failure rates. The temperature is within the manufacturers maximum continuous operation limits and the radiation is considered negligable. In consideration of the above it is concluded that this evaluation provides justification for continued operation through the winter heating system.

However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device before the end of the heating season.

TRO & TRS: Agastat Time delay relay models 7022AH and 7012 AB. The time-delay relays have been type-tested to the following conditions.*

Temparature - 100°C (212°F) for 42 days
Pressure - Atmospheric
Relative Humidity - 10-95 percent
Radiation - 2×10° Rad TID

*Reference Control Products Division Document E7012/E7022.

The environment in which the relays are located is significantly less severe than the test environment as listed above, therefore, this

The M

Page 3b

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7/

LICENSEE RESPONSE TO NRC SER (Continued)

MEB 32-001 RO Appendix Z Page 2 of 3

provides justification for continued use.

HATS: (TS-32-64, TS-64-91) Allen-Bradley Model 837 Temperature Switch. The following are the manufacturers maximum continuous operating conditions:

Temperatures - 140°F
Pressure - Atmospheric
Relative Humidity - Not specified
Radiation - Not specified

The environment conditions in which this device is located is within the manufacturers recommended maximum temperatures and pressures. The device is located within an enclosure which will limit the relative humidity to less than 100 percent noncondensing. The device has been successfully used in industrial applications which are at least as severe as those encountered by this device at its present location therefore this analysis is sufficient to justify continued use of this equipment. However, since sufficient documentation is not available to demonstrate suitability of the equipment for the environment, the device will be either type-tested or replaced with a type-tested device at the next refueling outage following receipt of a qualified device.

P.S: $(\hat{ps}-32-62A, PS-32-68A)$ Allen Bradley Bulletin Pressure Switch. The manufacturers maximum continuous operating conditions are as listed below:

Temperatures - 140°F
Pressure - Atmospheric
Relative Humidity - Not specified
Radiation - Not specified

The environmental conditions for temperature and pressure at the device location are within the manufacturers specified maximum continuous operating limits. The device is mounted in an enclosure where it is judged that the maximum humidity is less than 100 percent. The environment in which the device is located is within the limits of a typical industrial application. These devices have been successfully used in such typical industrial applications without abnormal failure rates. It is judged that this evaluation provides justification for continued operation. However due to lack of sufficient documentation to demonstrate the devices suitability for this environment, the device will be either typtested or replaced with a type-tested device at the next refueling outage following receipt of a qualified device.

UNL: (FSV-32-87, FSV-32-88) Skinner Solenoid Valve Model V5D46920. The manufacturers maximum specified continuous operating conditions are as follows:

Temperatures - 180°F
Pressure - Atmospheric
Relative Humidity - Not specified
Radiation - Not specified

The environmental conditions for temperature and pressure at the device

Page 3c

2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

LICENSEE RESPONSE TO MRC SER (Continued)

MEB 32-001 RO Appendix Z Page 3 of 3

location is significantly less severe than the manufacturers maximum recommended operating temperature and pressure limits. The device is located within an enclosure where it is judged that the maximum relative namidity will be less than 100 percent nonconcensing. This environment is typical of many industrial applications in which the device has been successfully used without an abnormal failure rate. This evaluation is sufficient to justify continued operation of the device.

However, due to lack of sufficient documentation, TVA will either typetest this device or replace it with a type-tested device at the next scheduled refueling outage after delivery of qualified devices.

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

EQUIPMENT ITEM NO. 72

ELECTRIC HEATER LOCATED IN THE CONTAINMENT

E. L. WRIGAN MODEL 04265379001

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 72

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): BACK UP PRESSURIZER HEATER ELEMENTS (VARIOUS)

SERVICE: PRESSURIZER HEATER ELEMENTS

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-48 (3.11-4 PAGE 21)

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,

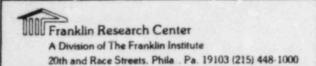
Not stated Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4e, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5€, 5 g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	72, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has net) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficien	
X The Licensee (has/has not) propose item whose qualification has not it	ed a corrective action for this equipment been fully established.
_X Justification for interim open Licensee for this equipment is	ration (has/h as ne t) been provided by the tem.
X Corrective action specified by	y the Licensee:
<pre></pre>	e submergence level
Verify qualification by ac	dditional (testing/analysis)
Equipment relocation to a Qualification testing of e Other (equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF RESULTANT NRC QUALIFICATION 3 (See Section 3 control of the contr	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification II.a Qualification Not Established	III.a Exempt
II.b Not Qualified	III.b Not in Scope IV Documentation Not Available



Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

Document Adequate Aging De Qualifie Program	Similarity egradation E	of Qualification Adequate Between Equipment and Test Specimen Es	X = DEFICIENCY
Adequate Aging De Qualifie Program	Similarity egradation E	of Qualification Adequate Between Equipment and Test Specimen Es	
Criteria O F O F O S Criteria Criteria Criteria Criteria Criteria Criteria Criteria Criteria Criteria	Established a Regarding a Regarding Peak Tempera Peak Pressure Duration Ade Required Pro Steam Exposu a Regarding	valuated Adequately eplacement Schedule Established (If Req to Identify Aging Degradation Aging Simulation Satisfied (If Required Temperature/Pressure Exposure: ture Adequate e Adequate quate file Enveloped Adequately re (If Required) Adequate Spray Satisfied Submergence Satisfied Radiation Satisfied Test Sequence Satisfied Test Failures or Severe Anomalies d Functional Testing Satisfied Instrument Accuracy Satisfied	uired)
Test Dur	ration Margi	n (1 hour + Function Time) Satisfied Margins Satisfied (NUREG-0588, Cat. I)	
	LIFICATION C		DESIGNATION: X = CATEGORY
I.a	Equipment Q		
I.D		ualification Pending Modification	X
II.a	Equipment Q	ualification Not Established	
II.b		ot Qualified	
II.c		atisfies All Requirements Except Qualif	ied Life
		ent Schedule Justified	
		xempt From Qualification	
III.a	Eduibreil		
III.a III.b	Equipment N	ot in the Scope of the Qualification Re	view

Page 3d

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

LICENSEE RESPONSE TO NRC SER

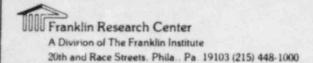
MEB-XX-48 Appendix 1

TVA I.D. No.: B/U GP A-A Pressurizer Heater Elements 22, 24, 26, 23, 30, 32, 40, 42, 44, 3, 5, 7, 15, 17, 34, 36, 38, 11, 19

3/U GP 8-8 Pressurizer Heater Elements 23, 25, 27, 29, 31, 33, 41, 43, 45, 2, 4, 6, 14, 18, 35, 37, 39, 8, 16, 10, 12

No documentation is available to verify environmental qualification of the subject heat elements. However, continued operation of the plant was justified by a Safety Evaluation (MEDS No. NEB 810617 284). These pressurizer heaters do not mitigate any FSAR evaluated accidents or maifunctions. They are not needed during a LOCA or for a SLB. They de not experience a harsh environment. Only TMI-type accidents cause harsh environments where the pressurizer heaters need to be functional.

The heaters are designed to 2500 psi and 680°F. They are not subjected to chemical spray. Since they are immersion heaters, humidity is not applicable. The design pressure and temperature of the heaters is the same as the pressurizer itself, which has a significant margin over the operating conditions (2235 psi and 653°F). The heaters are ASME Sec. III. The heaters see primary coolant conditions rather than "accident conditions." Therefore, the temperature and pressure will remain below the design temperature. While the heaters are not known to contain materials susceptible to radiation, they can not be considered fully qualified until further analysis is performed. They will either be fully qualified or replaced by June 30, 1962.



FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ___5/9/526

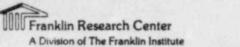
Page 40

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

SYSTEM CONSIDERATION REVIEW

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

presented below.	
Reason for Concurrence	Reason for Non-Concurrence
Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not	Backup (equipment/system) is not fully capable of performing the intended safety function or accide mitigating function.
required by the DOR Guide- lines. (NRC Qualification Evaluation Category IIIa)	Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environmen simultaneously with the primary equipment.
Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1)	Backup (equipment/system) is subject to a potentially disabling single active failure.
on page 4b. (NRC Qualification Evaluation Category IIIb)	Failure of the primary equipment c compromise the ability of other safety-related equipment to perfor
<pre>Backup (equipment/system) is available which completely per-</pre>	its specified safety function.
forms the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active	Failure of the primary equipment c result in erroneous indication whi could mislead an operator.
failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)	Requirement for continued function ing throughout the post-accident period necessitates environmental qualification.



NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. __5/9/526_

Page 4b

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

eason for Concurrence	Reason for Non-Concurrence
The equipment's accident miti- gating function is completed	Although backup equipment is avail- able, it is not technically sound to
prior to the onset of the hostile environment. No subsequent	relinquish defense-in-depth for this function.
functions are necessary. See	
note (1) below. (NRC Qualifi- cation Evaluation Category IIIb)	Backup (equipment/system) is not safety-related.
Other (see page)	This equipment is necessary for the operator to ensure an ESF system is
Resultant NRC Qualification Evaluation Category (IIIa/IIIb)	performing its intended safety function.
Note 1: The Licensee (has/	X The rationale presented by the
has not) stated that failure of the primary equipment will not affect other safety-related	Licensee is not supported by objective technical evidence.
equipment or cause an operator to be misled. (See page)	Other (see page)

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

EQUIPMENT ITEM NO. 73

TRANSDUCER LOCATED IN THE AUXILIARY BUILDING

ITT HAMMEL DAHL MODEL T-25

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 73

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GAS TREATMENT FAN (FM-30-148, -149)

SERVICE: FAN CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-1009 (3.11-6 PAGE 5, 3.11-8 PAGE 25)

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 REN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

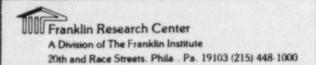
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c,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

Maintenance and Replacement Schedule Summary 7a, 7b, 7

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

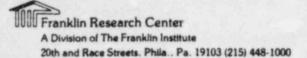
Page

SUMMARY OF LICENSEE RESPONSES TO THE M	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficies	
X The Licensee (has/kas not) propose item whose qualification has not be	ed a corrective action for this equipment een fully established.
✓ Justification for interim oper Licensee for this equipment it	ration (has/has met) been provided by the cem.
X Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by add	e submergence level ent from radiation source
Equipment relocation to a Qualification testing of e	mild environment
The state of the s	er information for this equipment item sis for justification for interim
★ The Licensee (*** has not) proceeding action. (Schedule action.) ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceed the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceed the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceed the corrective action. ★ The Licensee (**** has not) proceeding the corrective action. ★ The Licensee (**** has not) proceed the corrective action. ★ The Licensee (**** has not) proceed the corrective action. ★ The Licensee (**** has not) proceed the corrective action. ★ The Licensee (**** has not) proceed the corrective action. ★ The Licensee (**** has not) proceed the corrective action. ★ The Licensee (**** has not) proceed the corrective action. ★ The Licensee (**** has not) proceed the correcti	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from envi	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM					
		DESIGNATION:			
NRC REG	QUIREMENTS	X = DEFICIENCY			
Documen	nted Evidence of Qualification Adequate	_x_			
Adequat	e Similarity Between Equipment and Test Specimen Establi	ished			
Aging I	Degradation Evaluated Adequately				
Qualified Life or Replacement Schedule Established (If Required)					
Program	Established to Identify Aging Degradation				
Criter	ia Regarding Aging Simulation Satisfied (If Required)	-			
Criteri	a Regarding Temperature/Pressure Exposure:				
	Peak Temperature Adequate				
0	Peak Pressure Adequate	44,000			
	Duration Adequate				
o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied					
				ia Regarding Submergence Satisfied	
				a Regarding Radiation Satisfied	
Criter	Criteria Regarding Test Sequence Satisfied				
	ia Regarding Test Failures or Severe Anomalies Any) Satisfied				
	a Regarding Functional Testing Satisfied				
	ia Regarding Instrument Accuracy Satisfied				
	uration Margin (1 hour + Function Time) Satisfied				
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)				
NDC OIII	ALIFICATION CATEGORY	DESIGNATION: X = CATEGORY			
NAC QUA	ALIFICATION CRIBOOKI	1			
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	-			



Page 3a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB 1009

Revision 1

Appendix 3

Sheet 1 of 1

The transducers are required to operate in the following environment:

Temperature: 1150F Pressure: Atmospheric Relative Humidity: 100%

Relative Humidity: 100%
Radiation: 40 year TID - 3.51x10² rads
Accident - 1.0x10⁴ rads

R1

The manufacturer's specifications for the transducers are as follows:

Temperature: 150°F Pressure: Atmospheric Relative Humidity: Not Specified

Radiation: Not Specified

The temperature and pressure environment in which the transducers are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

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Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

EQUIPMENT ITEM NO. 74

I/P TRANSDUCER LOCATED IN THE AUXILIARY BUILDING

MASONEILAN MODEL 8005

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 74

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM GENERATOR LEVEL CONTROL (LM-3-148A, -156A, -164A,

-171A)

SERVICE: STEAM GENERATOR LEVEL

LICENSEE SUBMITTAL: SCEW(S): EEB-1038 (3.11-6 PAGE 21, 3.11-8 PAGE 20)

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:

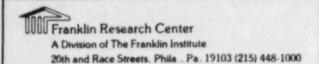
Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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	\$a, 5b, 5c, 5d, 5e, 5€, \$g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

7a, 7b, 7e

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	ded a response to the SER concerns.
The Licensee (has/has not) specification who environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	eration (has/has-bat) been provided by the tem.
X Corrective action specified b	by the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by a Equipment relocation to a Qualification testing of Other (re submergence level ment from radiation source additional (testing/analysis) mild environment
The state of the s	er information for this equipment item asis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED ON REVIEW
	or this law for begend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established	
II.b Not Qualified	IV Documentation Not Available



IV

Documentation Not Made Available

Page 2

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	DESIGNATION:
NRC REQU	IREMENTS	X = DEFICIENCY
Documente Adequate Aging Des Qualifies Program Criteria Criteria O Po O Ro O S Criteria Test Dur	ed Evidence of Qualification Adequate Similarity Between Equipment and Test Specimen Establ gradation Evaluated Adequately d Life or Replacement Schedule Established (If Require Established to Identify Aging Degradation Regarding Aging Simulation Satisfied (If Required) Regarding Temperature/Pressure Exposure: eak Temperature Adequate eak Pressure Adequate uration Adequate equired Profile Enveloped Adequately team Exposure (If Required) Adequate Regarding Spray Satisfied Regarding Radiation Satisfied Regarding Test Sequence Satisfied Regarding Test Sequence Satisfied Regarding Test Failures or Severe Anomalies y) Satisfied Regarding Instrument Accuracy Satisfied accuracy Satisfied Regarding Instrument Accuracy Satisfied accuracy Satisfied Regarding Margins Satisfied (NUREG-0588, Cat. I)	-
		DESIGNATION:
NRC QUAL	IFICATION CATEGORY	X = CATEGORY
	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	_X_
	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
	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	

Page 3d

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

LICENSEE RESPONSE TO NRC SER

Sheet No. EE3 1038

Revision 1

Appendix 3

Smeet 1 of 1

The transducers are required to operate in the following environment:

Temperature: 118°F Pressure: Atmospheric

Relative Humidity: 30-80% (100% peak)
Radiation: 40 year TID - 3.51x10² rads |
Accident - 1.0x10⁴ rads |

The manufacturer's specifications for the transducers are as follows:

Temperature: 150°F Pressure: Atmospheric

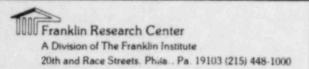
Relative Humidity: NEMA-4 Enclosure

Radiation: Not Specified

The temperature and pressure environment. In which the transducers are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

R2



Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

EQUIPMENT ITEM NO. 75

I/P TRANSDUCER LOCATED IN THE AUXILIARY BUILDING

ROBERTSHAW MODEL 445-C3

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 75

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MODIFIER (PDM-65-80, -82)

SERVICE: NOT STATED

LICENSEE SUBMITTAL: SCEW(S): EEB-1025 (3.11-6, PAGE 29)

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

R T, OT 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	la
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	\$a, 5b, 5c, 5d, 5c, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

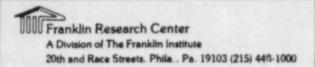
Maintenance and Replacement Schedule Summary 7a, 7b, 7c

SUMMARY OF LICENSEE RESPONSES TO THE M	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has-ast) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is
The Licensee has presented information outstanding qualification deficient	
X The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
X Justification for interim open Licensee for this equipment is	ration (has/back) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by acceptance of the second control of the second	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM				
		DESIGNATION: X = DEFICIENCY		
NRC REC	A - BULLOTHIOL			
Document Adequate Aging I Qualific Program Criteri O O O Criteri Criteri Criteri Criteri Criteri Criteri Criteri	nted Evidence of Qualification Adequate te Similarity Between Equipment and Test Specimen Establ Degradation Evaluated Adequately ied Life or Replacement Schedule Established (If Required Established to Identify Aging Degradation ia Regarding Aging Simulation Satisfied (If Required) ia Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate ia Regarding Spray Satisfied ia Regarding Radiation Satisfied ia Regarding Test Sequence Satisfied ia Regarding Test Failures or Severe Anomalies Any) Satisfied ia Regarding Functional Testing Satisfied ia Regarding Instrument Accuracy Satisfied iration Margin (1 hour + Function Time) Satisfied	-		
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)			
NRC QUA	ALIFICATION 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			



Page 3a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

LICENSEE RESPONSE T	U NK	U 21	740
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Sheet No. E	EB-1025
Revision	1
Appendix _	3
Sheet 1' o	f 1

The transducers are required to operate in the following environment:

Temperature: 115° F
Pressure: ATM
Relative Humidity: 100%

Relative Humidity: 100%
Radiation: 40 years TID = 3.5 x 10² rads
Accident = 1.0 x 10⁴ rads

The manufacturer's specifications for the transducers are as follows:

Temperature: 160° F Pressure: ATM

Relative Humidity: Not Specified Radiation: Not Specified

The temperature and pressure environment in which the transducers are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation, additional testing is being performed by Wyle Laboratories.

Rì

RT.

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

EQUIPMENT ITEM NO. 76

RELAY PANEL LOCATED IN THE AUXILIARY BUILDING

INTERNATIONAL SWITCHBOARD, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 76

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): REACTOR COOLANT PUMP UNDERVOLTAGE RELAY BOARDS (1A, 1B,

2A, 2B)

SERVICE: REACTOR COOLANT PUMP UNDERVOLTAGE

LICENSEE SUBMITTAL: SCEW(S): EEB-0001 (3.11-6 PAGE 12)

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,

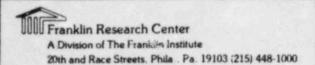
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3h, 3a, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	567 5b, 5c, 5d, 5e, 5t, 5g, 5h, 5i, 5j
Installed THI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	70, 70, 70

Page

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
Y The Licensee (has/har 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 III.a Exempt III.a Qualification Not Established III.b Not in Scope III.b Not Qualified IV Documentation Not Available



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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
		DESIGNATION:
NRC REC	<u>UIREMENTS</u> <u>X</u>	= DEFICIENCY
ocumer	ted Evidence of Qualification Adequate	
dequat	e Similarity Between Equipment and Test Specimen Establis	hed
ging [Degradation Evaluated Adequately	
	ed Life or Replacement Schedule Established (If Required)	
rogran	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	-
Criteri	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
0	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	-
Criteri	a Regarding Spray Satisfied	
criter	a Regarding Submergence Satisfied	
Criteri	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
(If A	any) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
rest Du	ration Margin (1 hour + Function Time) Satisfied	
Criter	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
.a	Equipment Qualified	1
d.1	Equipment Qualification Pending Modification	
I.a	Equipment Qualification Not Established	-
I.b	Equipment Not Qualified	
I.c	Equipment Satisfies All Requirements Except Qualified Li	fe
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	×
	Equipment Not in the Scope of the Qualification Review	
III.b	Documentation Not Made Available	-

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

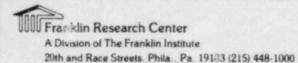
LICENSEE PESPONSE TO NRC SER

EEB-0001 Appendix I. Rev O

- 1. 6900-VOLT RCP PT RELAY BOARDS 1A, 18, 2A, 28 Table 3.11-6, sheet 12
 - a. These relay boards provide signals to the reactor protection system (RPS) for undervoltage or underfrequency conditions on the reactor coolage pump (RCP) power gource.
 - b. The relay boards are located in the Auxiliary Building (General Spaces).
 - c. The relay boards were purchased from International Switchboard Corporation - TVA contract 78K5-823380.
- The relay boards are required to operate in the following environment (normal):

Temperature: 104° F
Pressure: Atmospheric
Relative Humidity: 30 % - 80% (98% peak)
Radiation: 500 Rads (40 years)

- 3. The relay boards are Category C equipment and they need not function for mitigation of design basis accidents. Their failure (in any mode) is not detrimental to plant safety or accident mitigation, and must be qualified only for its non-accident Service environment (given above).
- 4. This equipment has not been specifically qualified for its normal environment and consequently nonconformance report SQNEEB8015 has been issued against it. The manufacturer of this equipment will test identical equipment to meet all the requirements of IEEE 323-1974. In the manufacturer's letter dated August 11, 1980 (copy attached) to F. W. Chandler, they state that it is their opinion that "this equipment can be qualified to IEEE 323-1974." For this reason and the fact the radiation level is negligible and the temperature, pressure, and relative humidity are within the normal operating range of this type equipment, the equipment is satisfactory for continued safe operation while the proper documentation is being obtained.



Page 4 a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

SYSTEM CONSIDERATION REVIEW

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

Reason for Concurrence

- Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
 - Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
 - Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

EQUIPMENT ITEM NO. 77

ELECTRIC CABLE SPLICE LOCATED INSIDE AND OUTSIDE CONTAINMENT

RAYCHEM MODEL WCSF (N)

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 77

LICENSEE REFERENCE(S): 815

FUNCTION (PLANT ID): CABLE CONNECTION AND TERMINATION

LICENSEE SUBMITTAL: SCEW(S): EEB-SPL-1

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

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

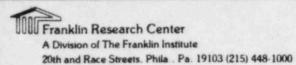
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 40, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5 <u>1</u>
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	70, 70, 70

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SUM	MARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
×	The Licensee (has/h as not) provide	d a response to the SER concerns.
*	The Licensee (has/has not) specific qualified and or will function whe environmental service conditions.	
×	The Licensee has presented informa outstanding qualification deficient	
_	The Licensee (has/has not) proposed item whose qualification has not be	d a corrective action for this equipment een fully established.
	Justification for interim operations Licensee for this equipment it	ation (has/has not) been provided by the em.
	Corrective action specified by	the Licensee:
	Equipment replacement with Equipment modification	qualified equipment
	Equipment relocation above	submergence level
	Relocate or shield equipmen	nt from radiation source
	Verify qualification by add	ditional (testing/analysis)
	Equipment relocation to a n	
	Qualification testing of ed	quipment in progress
	The Licensee has provided other that can be construed as a basi operation.	information for this equipment item is for justification for interim
		rided a schedule for the proposed for accomplishing the corrective
	The Licensee states that the equipment and/or should be exempted from envi	ment item does not require qualification ironmental qualification.
	IGNATION OF RESULTANT NRC QUALIFICAT	TION EVALUATION CATEGORY BASED ON REVIEW
I.a	Qualified	II.c Qualified Life Deficiency
I.b	Modification	III.a Exempt
	Qualification Not Established	III.b Not in Scope
II.b	Not Qualified	IV Documentation Not Available



FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/26

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NRC REC	QUIREMENTS	DESIGNATION: C = DEFICIENCY				
Documented Evidence of Qualification Adequate						
	e Similarity Between Equipment and Test Specimen Establishegradation Evaluated Adequately	shed				
Aging D	× ×					
Qualifi	X					
Program	-					
Criteri						
Criteri						
	Peak Temperature Adequate					
	Peak Pressure Adequate	-				
	Duration Adequate	***************************************				
o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate Criteria Regarding Spray Satisfied	Market and an overall					
	www.notcacoo					
	with a contract to					
Criteria Regarding Submergence Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies		-				
(If A						
Criteri	-					
Criter						
Test Du	uration Margin (1 hour + Function Time) Satisfied	-				
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)					
		DESIGNATION:				
NRC QUA	ALIFICATION CATEGORY	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 L	ife				
	or Replacement Schedule Justified	X				
III.a	Equipment Exempt From Qualification					
III.b	Equipment Not in the Scope of the Qualification Review					
IV	Documentation Not Made Available					

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

LICENSEE RESPONSE TO NRC SER

Raychem Electrical Splices - Type WCSF-N

- a. Qualification is be testing as described in the Franklin Institute Research Laboratories Test REport F-C4033-3, "Tests of Raychem Thermofit Insulation Systems Under Simultaneous Exposure to Heat, Gamma Radiation, Steam and Chemical Spray While Electrically Energized."
- b. During testing the test specimens were subjected to an environmental test program based on the guidelines of IEEE-323-1974 and 383-1974.
- c. All the requirements for category II of section 2.2 of NUREG-0588 were met or exceeded during test.
- d. The test sequence meets the requirements of IEEE-323-1974 section 6.3.2 and was as follows:
 - Seven day combined thermal and radiation aging at 150° C and 5 x 10 rads (gamma) while electrically energized.
 - Simultaneous exposure to steam, chemical spray, and gamma radiation (S/C/R). (See figure I-4). The specimens were electrically energized during S/C/R exposure.
- e. Electrical integrity of the specimens was evaluated for acceptance by (1) insulation resistance measurements, (2) the ability to maintain electrical loading during the test cycle, and (3) by high-potential withstand tests performed after bending at the conclusion of the exposure.
- f. Margins as specified in IEE-323-1974, section 6.3.1.5, were met or exceeded. Figure I-4 (Appendix 2) envelopes the profile recommended for category a. qualification.
- g. Thermal and radiation aging were done in accordance with section 6.3.3 of IEEE-323-1974.
- in. It can be concluded that the splicing technique used at SNP can be expected to function properly over the life of the plant.

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 5/9/54 6

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		UALIFICATION REVIEW	
Criteria: DOR Guidelines	; NUREG-0588,	Cat. I; NUREG-0588, Cat.	11 🗶
NRC REQUIREMENTS			EFICIENC
WITH SECTION REFERENCE	CICENSEE	QUALIFICATION	(X OR
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE NO.
EQUIPMENT DESCRIPTION			
Equipment Type	coupler	Electrical Cable Splice Raychem Corporation	
Manufacturer's Name	: Ruchem	Raychem Corporation	
(5.2.2/-/-)	: 6	i may chem corporation	
Model Number (5.2.2/-/-)	: WCSF-N	Raychem Thermofit	
Serial Number		WCSFN	
serrar number	: 47	Not Applicable	
Features/Mounting	: /	On Mandrel In Autoclave	
(5.2.6/-/-)		on Mandrer in Autociave	
Connections/Interfaces	: ./	!	
(5.2.6/-/-)	: "	Test Item Is a Cable Splice (Note 1 p 5i1&5i2)	
Location/Elevation	: seepia	!	
Equipment ID No.	NA	Not Applicable Not Applicable	
	:	NOT Applicable	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	F-C4033-3	F-C4033-3	
Panart Data			
Report Date	1/75	January 1975	
Issued by	MRL	Franklin Institute Research Laboratories	
Prepared for	! Remoher	Raychem Corporation	
Referenced Reports	CALA		
referenced reports	: "	Not Applicable	
Qualification Method	: /	Simultaneous Test	
(5.1, 5.3/2.1, 2.4/2.1, 2.4)			
QUALIFICATION TEST PROGRAM	:		
Functional Test Description		: Insulation Resistance/	
(5.2.5/2.2.9/2.2.9)		Current Carrying Capabilit	y
Operating Conditions	:	and HiPot	:
(-/2.2.10/2.2.10)	: 1/	See Note 1 p 5i1 & 5i2	
Load/Cycles/Voltage/ Current/Freq.	: 0	:	

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/52-6

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
Acceptance Criteria			
(5.2.5/2.2.1/2.2.1)	: N/A	Not Stated	1
	: 1"		:
Accuracy (5.2.5/-/-)		Not Applicable	
Number of Specimens	:	30	
Test Instruments Calibrated		Yes	
Safety Punction (Active/	:		i
Passive) (~/2.1.3/2.1.3)	!	ActiveCarry current	1
Test Duration (5.2.1/-/-)	· U	30 Days	
Accident Duration (Envir.	1.		!
Above Normal) (5.2.1/-/-)	:>24his	Not Applicable	:
Required Function Time	Notstated	Not Applicable	
Test Sequence (General)	1		i
(5.2.3/2.3.1/2.3.1)	: NA	Visual Inspection	
Test Sequence (NUREG-0588,		Insulation Resistance	:
Cat. I) (-/2.3.1/-)		Thermal/Radiation Aging Visual Inspection	
		Insulation Resistance	!
1. Representative Sample		LOCA Simulation	!
2. Baseline Data		Visual Inspection/	
3. Performance Extremes		Insulation Resistance/	
4. Thermal Aging 5. Radiation Aging	:	HiPot	
6. Wear Aging			
7. Vibration/Seismic	:		!
8. DBE Exposure	1		:
9. Post-DBE Exposure			
10. Inspection	: 1		
Aging			
(5.2.4, 7.0/4.0/4.0)	:	7 Days @ 150°C	: x
Thermal Aging/Basis	: Not	Not Stated	note
Material Aging	!		: /
Evaluation (7.0/-/-)		Visual Inspection/ Insulation Resistance	:
Materials Susceptible	:		!
(Thermal) (5.2.4, 7.0/-/-)	:	Not Stated	+
Radiation Aging, Type	: 1		
		Gamma	

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FRC Assignment No. 13
FRC Task No. 5/9/5/26

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NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	DEFICIENCY (X OR
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE NO.)
Radiation Aging, Dose (rd)	2x107rd	5×10 ⁷	
Radiation Aging, Dose Rate	50 pt/h	Not Stated	
Radiation Aging, Method	NA	Test	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)		Not Stated	
Operational Aging (-/4.2/-)		Not Stated	
Other Age Conditioning (~/4.2/-)	1	Not Stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	Plant	Not Stated in Test Report	nose
Normal Ambient Temperature Normal Ambient Radiation Normal Ambient Humidity	50NS/L.	Not Applicable Not Applicable	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	Typoper	Not Applicable	
On-Going Analysis of Failures and Degradation (7.0/-/-)		Not Applicable	
Margin (General) (6.0/3.0/3.0)	yo	Not Stated	
Margin (NUREG-0588, Cat. I) (-/3.2/-) 1. Temperature (+15°F) 2. Pressure (+10%, 10 psig max)		Not Stated	
3. Radiation (not required) 4. Time (+10%, +1 hour	V		
+ function time minimum)	1		:

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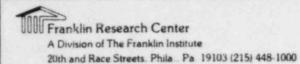
NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	LOCA	LOCA/ MSLB	
Radiation Type	Some	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	1x,old	197.7-209.8 Megarads	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	Notstaked	Not Stated Test	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	not sould	Not Applicable	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)	V	Not Stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	1.24108	Not Applicable	
Plateout Dose Considered (-/1.48/1.48)	4×1082	Not Applicable	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	:	Not Applicable	

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. ___519/526

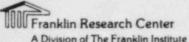
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NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	DEFICIENCY (X OR
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase		10°F;7Psi/second	
Peak: °F/psig/RH/Time		357/70/100%/10 hrs	
Decrease To: °F/psig/RH/Time	See page	357-275/70-31/100%/2hrs	
Decrease To: °F/psig/RH/Time	59	275/31/100%/4days	
Decrease To: °F/psig/RH/Time		212/10/100%/26 days	1
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C,	NA	Not Applicable	
2.2.6/1.2.5.C, 2.2.6)	1		•
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	J	Test	
Spray Composition	Not Stated	3000 ppm Boron 0.064 Molar Na ₂ S ₂ O ₃	
(4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)		NaOH for pH of 10.5	
Spray Density (gpm/ft ²)		0.15	
Spray Duration		30 days	
Submergence Duration (4.1.3/2.2.5/2.2.5)		Not Applicable	
In-Leakage Considered (5.2.6, 5.3.2/-/-)		Not Applicable	
Time to Submergence		Not Applicable	
Dust Environment		Not Applicable	
(-/2.2.11/2.2.11)	: 0		:



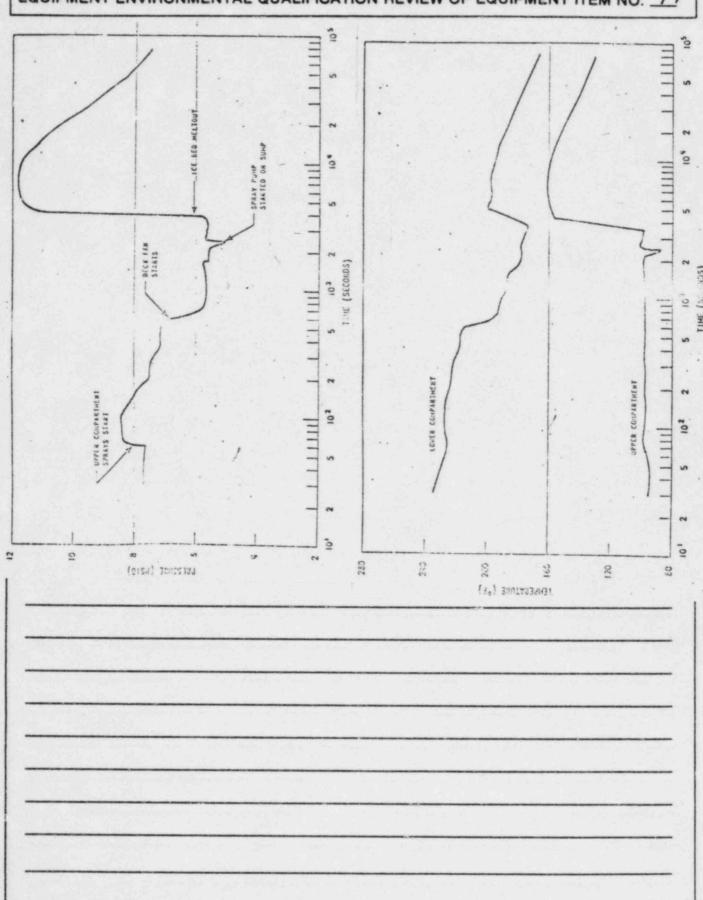
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NOTES: 1. The Licines states that the equipment to qualified for the life of the plant but his surt provided any backup logitime which Semonstrate the lifetime claimed.



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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. 5/9/52-6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

NOTES:

2. TEST SPECIMENS

tested and also shows the energizing voltage and currents levels,

Table 1 presents a description of the specimens

Table 1 Test Specimens

Specimen	Specimen Electrical L Voltage In		itial Curren	
Description *	Number [†]	Length (ft)*	(Vrms - 60 Hz)	(A)*
Raychem Thermofit [®] In-Containment Field Splice Cable - Raychem Adverse Service Coaxial Cable, AWG 22 conductor	9X	20	600	0
1st insulation layer - 8 mil wall of Alkane-imide polymer 2nd insulation layer - 49 mil wall of Rayolin R™ radiation cross-linked polyolefin Braided Copper Shield				
Raychem Flamtrol TM Jacket - 34 mil nominal wall Part No. 10483 Run No. J7-5-10-72-6				
Splice Components for one splice Raychem Thermofit® WCSF-115-6-N Soldered connection (See Figure 1)				
Raychem Thermofit® In-Containment Field Splices Cable AWG 4 insulated with EPR- neoprene (not a Raychem product) Splice Components for six splices (Note 1) Raychem Thermofit® WCSF-200-6-N 2 each of compression connectors: Burndy Hylink YS4C-L T&B 2F-4 3M #4	13	35	2000	70
Raychem Thermofit [®] In-Containment Field Splices Cable AWG 6 insulated with Raychem Flamtrol [™] Splice Components for six splices (Note 1) Raychem WCSF-200-6-N 6 each of compression connectors: Burndy Hylink YS6C-L	14	37	1000	65
taychem Thermofit ⁸ In-Containment Field Splices Cable AWG 12 insulated with EPR neoprene (not a Raychem product) Splice Components for six splices (Note 1) Raychem WCSF-115-6-N 3 each of compression connectors: Burndy Hylink YSV10 T&B 2C-10	15	32	2000	25
taychem Thermofit [®] In-Containment Field Splices. Six splices. Same construction as Sample #15 except that Raychem Flamtrol [™] wire was used	16	33	1000	25

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. __579/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

NOTES:

Table 1 Test Specimens (continued)

Specimen			Electrical Loading	
Description*	Number [†]	Length (ft)\$	Voltage (Vrms - 60 Hz)	Initial Current (A)*
Raychem Thermofic In-Containment Transition Splices	17	23	1000	65
Cable AWG 6 insulated with Raychem				
Flamtrol TM , spliced to three cables of AWG 12 insulated with Raychem				
Flamtrol™ and reconnected to an				
AWG 6 cable insulated with ' Raychem Flamtrol™				
Splice Components for two splices (Note 1)				
Raychem Thermofit® WCSF-200-6-N Raychem Thermofit® heat-shrinkable				
3-finger cable breakout (Part Number				146
403A112-4/83) used to provide seal at				
the transition between the AWG 6 and the three AWG 12 cables.				
2 each of compression connectors:				
Burn'y Hylink YS6C-L				

and Trademarks of Raychem Corporation

* Description of specimens provided by Raychem

† Specimens 1 thru 3 and 10 thru 12 were other test specimens supplied by Raychem. The test results on these specimens are presented in report numbers F-C4033-1 and -2.

* Specimens cut to lengths shown. Approximately 4 ft of the length extended outside of the test vessel (2 ft on each end of the specimen).

Initial currents were applied at room temperature, and allowed to drop to a lower level during combined radiation and thermal aging and simultaneous LOCA-simulation testing. See text for discussion.

Note 1 - Each in-line splice or transition was covered with tinned copper wire mesh to aid in providing

a close proximity ground plane as shown in Figure 2.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

EQUIPMENT ITEM NO. 78

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

AMERICA INSULATED WIRE, MODEL NOT STATED

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 78

LICENSEE REFERENCE(S): 6451

FUNCTION (PLANT ID): SROAJ CABLE SERVICE: ELECTRICAL DISTRIBUTION

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-1

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

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

Not stated, Not applicable

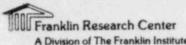
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Licensee Response to NRC SER	3a, 3b, 3o, 3d
System Consideration Review	40, 45, 40, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5€, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7o

A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 FRC Project No. C5287
FRC Assignment No. 13
FRC Task No. 579/526

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SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
∑ The Licensee (has/hes not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	cally stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided by the cem.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipme	
Verify qualification by ad	ditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e	equipment in progress
man Viscous has accorded ashed	
	ex information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NEC QUALIFICA	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
III.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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NDC DEOL	UIREMENTS	DESIGNATION: X = DEFICIENCY
ne nov	OTROPIONE O	
ocumen	ted Evidence of Qualification Adequate	
dequate	e Similarity Between Equipment and Test Specimen Establisher and Evaluated Adequately	shed X
malifi	ed Life or Replacement Schedule Established (If Required)	
rogram	Established to Identify Aging Degradation	-
riteri	a Regarding Aging Simulation Satisfied (If Required)	-
riteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	-
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	-
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION
NRC QUA	LIFICATION CATEGORY	X = CATEGOR
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 I or Replacement Schedule Justified	ife
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
TTT . D		

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

LICENSEE RESPONSE TO NRC SER

American Ins. Wire - Contract 822502

- Qualification is by test as described in Franklin Institute Report F-C5119.
- b. The objective of the program was to demonstrate the performance of the subject wire for Class 1E service in nuclear power generating plants during a steam/chemical spray exposure following thermal aging and gamma irradiation in accordance with guidelines contained in IEEE 323-1974 and IEEE 383-1974.
- c. Thermal aging for a minimum of 14 days at 204° C was conducted prior to irradiation to 10, 50, and 200 megarads (different samples) to simulate an installed life of 40 years at 90°C and 10 years at 125°C.
- d. All specimens were subjected to a 33-day steam/chemical spray exposure (see Appendix 2 - IEEE 323-1974 accident profile).
- e. The specimens were tested during and after the steam/chemical spray exposure. Failure criterion was established prior to testing.
- f. It is concluded from the above test and using the Arrhenius technique that the cables will function for at least 40 years at a continuous operating temperature of 90°C and at least 10 years at a continuous operating temperature of 125°C and satisfactorily perform during postulated DBA's. The cables will be tested at the end of 10 years for an aging evaluation, surveillance, and a replacement schedule.
- g. It is concluded from the above test and the generic envelope shown in Appendix C of NUREG 0588 that the cables will function satisfactorily during the postulated Main Steam Line Break.

Dision of The Franklin Institute

Jith and Race Streets, Phila., Pa. 19103 (215) 448-1000

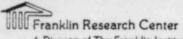
Page 5a

NOTES: The licensee has not pr	rovided sufficient information	to octablish that the
	the SCEW sheet is the same as	
in the referenced repor		
The rype	ant is for Denes	I Electric Cott
0		
	prepared for	
	General Electric Company Waterford, New York	
- The intol	led Cable is &d	entiqued as
American	led Cable is Da	ie supplied

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Requirements for establishing similarity between installed and tested cables				
	Guidelines and IEEE 383-76			
below for convenience.				
equipment bein	- The test specimen should be the same many qualified. The type test should only identical in design and material constru	pe considered valid		
specimen. Any	y deviations should be evaluated as part stron (see also Section 8.0 below).			
		[Sioc		
	IEEE-382 1.3.1 Cable Description. This description or specification should include as a minimum: 1.3.1.1 Conductor — material identification. size, stranding, coating, 1.3.1.2 Insulation — material identification, thickness, method of application. 1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes, extrusions, braids, or others. 1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application. 1.3.1.8 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Splice or Connection Description or Both. This description or specification should include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembly. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.			
show ers. ink. of the lists sent	Type Test Samples. The samples tested aid contain the conductor, insulation, fill-scher, binder tape, overall jacket, shield-and field spiires which are representative to cable category being qualified. Table 1 sizes which have been considered representive of these categories. The sample the should be sufficient to permit reliable			



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			Std 383-1974
	Table 1 Represensentative Cables fo	r Type Tests	
Туре	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded multiconductor	temperature and moisture resistance	2.3.1	1/C - 14 or 12 AWG
signal cable (see list below for individual component) or	thermal and radiation	2.3.3	1/C or M/C -
Single conductor power cable	design basis event	2.4	14 or 12 AWG 1/C or M/C -
	mulation		14 or 12 AWG 1/C - 6, 4 or 2 AWG
	vertical flame test singles from cable assembly	2.5.6	1/C - 14 or 12 A'VG
	vertical tray flame test	2.5.4	7/C - 16, 14 or 12 AWG
Shielded pairs, triple or quad from reulticonductor	temperature and moisture resistance	2 7.1	1 pair shielded 16 AWG or actual cable
signal cable	thermal and radiation exposure	2.3.3	
	design basis event	2.4	
	vertical flame test	2.5.6	
Coaxial, triaxial or special instrument cable	temperature and moisture . resistance .	2.3.1	actua: size
	thermal and radiation exposure	2,3.3	
	design basis event	2.4	
	vertical flame test singles from cable assembly	2.5.6	
Single pair thermocouple extension cable	temperature and moisture resistance	2.3.1	2/C - 20 AWG or actual size if smaller
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical tray flame test	2.5.4	
	vertical flame test singles from cable assembly	2.5.6	
2001-15 000 V power cable 1/C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5kV) 2/O or 4/O or 4/O (2-15kV)
f the detailed des	cription discussed	above it	would be accept
icensee to obtain	certification from	the manu	facturer diameter
report(s) apply t	o the cables furnis	shed for	installation.
	The state of the s		Colonial Col

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

EQUIPMENT ITEM NO. 79

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

ROCKBESTOS, MODEL NOT STATED

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 79

LICENSEE REFERENCE(S): 4736, 1327

FUNCTION (PLANT ID): SROAJ AND SROAJ-H

SERVICE: ELECTRICAL DISTRIBUTION

LICENSEE SUBMITTAL: (SCEW(S): EEB-CBL-2 (3.11-4A PAGE 1)

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

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

Not stated, Not applicable

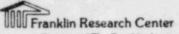
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3 b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f , 5g, 5b, 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. 519526

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SUMMARY OF LIC	CENSEE RESPONSES TO THE	E NRC SER - ONLY CHECKED ITEMS ARE APPLIC	CABLE
Y The Licens	see (has/has not) provi	ided a response to the SER concerns.	
qualified		ifically stated that the equipment is when exposed to the applicable DBE	
	see has presented infor ng qualification defici	rmation which shows there are no iencies.	
Management of the Control of the Con		osed a corrective action for this equipment been fully established.	nt
	fication for interim op see for this equipment	peration (has/has not) been provided by titem.	he
Correc	ctive action specified	by the Licensee:	
	quipment replacement wi	ith qualified equipment	
- Management	quipment relocation abo	ove submergence level	
Management 7		oment from radiation source	
		additional (testing/analysis)	
- CONTRACTOR - CON	quipment relocation to		
	alification testing of		
- Committee -	ther (equipment in progress)
- Company of the Comp	can be construed as a b	ther information for this equipment item basis for justification for interim	
**************************************	tive action. (Schedule	rovided a schedule for the proposed the for accomplishing the corrective	
The Licens	ee states that the equ	ipment item does not require qualificati	on
and/or sho	uld be exempted from e	environmental qualification.	
THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.		CATION EVALUATION CATEGORY BASED ON REVI	EW
- CIRCLED ITEM	ONLY: (See Section 3	of this TER for Legend)	
I.a Qualified		II.c Qualified Life Deficiency	
I.b Modificat		, III.a Exempt	
	tion Not Established	III.b Not in Scope	
II.b Not Quali		IV Documentation Not Available	
II.D HOC QUAIT		2. Documentation not hyairable	



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FRC Task No. 579/126

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		DESIGNATION:
NRC REC	CIREMENTS	X = DEFICIENCY
Documer	ted Evidence of Qualification Adequate	
	e Similarity Between Equipment and Test Specimen Establi	shed X
Aging I	egradation Evaluated Adequately	
	ed Life or Replacement Schedule Established (If Required)
Program	Established to Identify Aging Degradation	-
Criter	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
	Peak Pressure Adequate	**********
	Duration Adequate	-
	Required Profile Enveloped Adequately	-
	Steam Exposure (If Required) Adequate	electric leaders.
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	-
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
Criter	a Regarding Functional Testing Satisfied	-
Criter	a Regarding Instrument Accuracy Satisfied	
Test D	ration Margin (1 hour + Function Time) Satisfied	
Criter	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION
NRC QUA	ALIFICATION CATEGORY	X = CATEGOR
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 I	ife
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
	Equipment Not in the Scope of the Qualification Review	
III.b	Edarbuette nos su ene acebe en ene Energia	and the second section is

Page 3c

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

LICENSEE RESPONSE TO NRC SER

Rockbestos - Contracts WB87235, 824308, 823428, WB821729

- a. Qualification is by test as described in Rockbestos reports "Qualification of FIREWALL SR, Class 1E Cables" dated March 2, 1978, and June 7, 1978.
- b. The test program was to demonstrate that the subject cables will function during LOCA. The test program was based on IEEE-383-1974.
- c. Test samples were first subjected to a radiation dose of 2 x 10⁸ rads and thermally aged for 1400 hours at 180°C to simulate an installed life of 40 years at 125°C. Other test samples were subjected to a radiation dose of 2 x 10⁸ rads and thermally aged for 400 hours at 250°C to simulate an installed life of 20 years at 200°C. Then the samples were subjected to the IEEE-323-1974 accident profile. (See appendix 2.)
- d. The samples were energized during testing and further testing performed after exposure.
- e. It is concluded from the above test and using the Arrhenius technique that WPA, WPB, WPC, and WPG cables will function for at least 40 years at a continuous operating temperature of 125°C and after exposure of 200 megarads and during postulated DBA, while WPH-1 cable will function for at least 20 years at 200°C and after exposure of 200 megarads and during postulated DBA. The WPH-1 cables will be tested at the end of 20 years for an aging evaluation, surveillance, and a replacement schedule.
- f. It was concluded from the above test and from the generic envelope shown in Appendix C of NUREG 0588 that the cables will satisfactorily function during the postulated Main Steam Line Break.

Franklin Research Center
Dision of The Franklin Institute

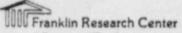
Jih and Race Streets. Phila. Pa. 19103 (215) 448-1000

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NOTES:
The licensee has not provided sufficient information to establish that the
Equipment described on the SCEW sheet is the same as the Equipment described
in the referenced report.

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are contained in	establishing similarity between installed and tested cables the DOR Guidelines and IEEE 383-74 which are reproduced
elow for conveni	
2. <u>Tes</u>	st Specimen - The test specimen should be the same model as the
equ	sipment being qualified. The type test should only be considered valid
	equipment identical in design and material construction to the test
spe	ecimen. Any deviations should be evaluated as part of the qualifica-
tic	on documentation (see also Section 8.0 below).
	[2005]
	7
	IEEE-383 1.3.1 Cable Description. This description or
	specification should include as a minimum.
	1.3.1.1 Conductor - material identi- fication, size, stranding, coating.
	1.3.1.2 Insulation — material identi- fication, thickness, method of application.
	1.3.1.3 Assembly (multiconductor cables
	only) — number and arrangement of con- ductors, fillers, binders.
	1.3.1.4 Shielding — tapes, extrusions, ————————————————————————————————————
	1.3.1.5 Covering — jacket or metallic ar-
	mor or both, material identification, thick
	1.3.1.6 Characteristics - voltage and
	temperature rating (normal and emergency). For instrumentation cables — capacitance.
	attenuation, characteristic impedance, micro-
	phonics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's
	trade name, catalog number. 1.3.2 Field Splice or Connection Description
	or Both. This description or specification
	should include as a minimum: 1.3.2.1 Whether factory or field assem-
	bled to cable.
	1.3.2.2 Conductor connection — type, material ident/Scation, and method of assem-
	bly. 1.3.2.3 Items from Sections 1.3.1.2
	through 1.3.1.7.
	2.2 Type Test Samples. The samples tested
	should contain the conductor, insulation, fill- ers, jacker, binder tape, overall jacket, shield-
	ink, and field splices which are representative
	of the cubic category being qualified. Table 1
	lists sizes which have been considered repre-
	lengths should be sufficient to permit reliable
	test readings and evaluation consistent with



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FRC Project No. C5257
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	ELECTRIC CABLES, FIELD SPLE	CES, AND CONNECTIONS		Std 383-1974
		Table 1 Represensentative Cables fo	r Type Tests	
	Type	Test	Section	Size
	Up to 2000 V multicenductor control cable or Shielded multiconductor	temperature and moisture resistance	2 3.1	1/C - 14 or 12 AWG
	signal cable (see list below for individual component) or	thermal and radiation	2.3.3	1/C or M/C 14 or 12 AWG
	Single conductor power cable	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 1/C - 14 or 12 AWG
	-	vertical tray flame test	2.5.4	7/C - 16, 14 or 12 AWG
	Shielded pairs, triple or 4-126 from multiconductor rights cable	temperature and moisture resistance thormal and radiation	2.3.1	1 pair shieided 16 AWG or actual cable
		exposure design basis event	2.4	
		simulation vertical flame test		
	Cooxial, triaxial or	temperature and moisture	2.5.6	actual size
	special instrument cable	resistance * thermal and radiation	2.3.3	actual size
		exposure design basis event simulation	2.4	
		vertical flame test singles from caule assembly	2.5.6	
	Single pair thermocruple extension cable	temperature and moisture	2,3.1	21C - 20 AWG or actual size if smaller
		therms! 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 last	2.5.4	6 AWG (2-5kV) 2/O or 4/O or 4/O (2-15kV)
_	MOTO CONTRACTOR STORY OF CONTRACTOR OF CONTR			
u	of the detailed desc	cription discussed	above it	would be accepta
	licensee to obtain o			
	t report(s) apply to			

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. __5/9/52/6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

EQUIPMENT ITEM NO. 80

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

ANACONDA/CONTINENTAL, MODEL NOT STATED

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 80

LICENSEE REFERENCE(S): 2818, 4651

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (SROAJ, SROAJ-H)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-3

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:

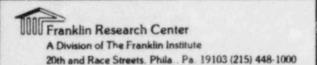
Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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	ta, 46, 40, 4d, 40, 45
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5£ , 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

7a, 7b, 7e

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SUMMARY OF LICENSEE RESPONSES TO THE M	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (nas/has not) specific qualified and/or will function who environmental service conditions.	cally stated that the equipment is n exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment seen fully established.
Justification for interim open Licensee for this equipment it	ation (has/has not) been provided by the em.
Corrective action specified by	the Licensee:
Equipment relocation to a Qualification testing of e Other (submergence level ent from radiation source ditional (testing/analysis) mild environment
	is for justification for interim
	rvided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	ment item does not require qualification ironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON REVIEW 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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NRC REC	UIREMENTS X	DESIGNATION: = DEFICIENCY
Doguman	ted Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establis	hed X
	egradation Evaluated Adequately	X
bualifi	ed Life or Replacement Schedule Established (If Required)	hed X
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	_X_
	Peak Pressure Adequate	-
0	Duration Adequate	-
0	Required Profile Enveloped Adequately	-
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
Criteri	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	-
Criteri	a Regarding Test Sequence Satisfied	-
	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	-
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfie (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	LIFICATION CATEGORY	X = CATEGORY
.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
I.a	Equipment Qualification Not Established	X
I.b	Equipment Not Qualified	\equiv
I.c	Equipment Satisfies All Requirements Except Qualified Li	fe
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.a	Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review	-

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

LICENSEE RESPONSE TO NRC SER

EFB CBL-3, Rev 2 Appendix 1, Rev 2

Continental Wire - Contracts 85361, 83999, 85112, 825018

	ė.	Qualification is by test as described in Franklin Institute Report F - C2935 and Anaconda-Continental Report No. 79117.		
	b.	Report F - C2935 demonstrates the main steam line break pressurmance.	1	R1
	6.1	Report F - C2935 test included irradiation to 10 megarads and testing in a steam environment as outlined in appendix 2. The samples were preconditioned prior to test.	1	RI
	b.2	The test samples were electrically loaded during testing.		
	b.3	It was concluded that the samples would adequately perform in the environment to which tested.		
	b.4	It was concluded the main steam line break test profile was more severe than the profile required by Figure 6.1.3 of Table 6.1.f°.	1	RI
	c.	Report 79117 describes testing to determine the suitability of the subject cable for service within containment for DBA-LOCA.		
	c.1	This test included thermal aging a minimum of seven days at 210°C and twenty eight days at 210°C followed by irradiation to either 20 or 120 megarads.	-	21
	2	All specimens were subjected to a steam chemical spray environment for 16 days. (See appendix 2 for profile.)	1	R
	c.3	Chemical was conducted over the entire test. The solution was camposed of 3000 ppm boron as H ₃ 80 _e buffered to a ph of 8.0 to 8.2.	1	21
-	6.4	Electrical test were conducted furing the simulation and again after cool www. Mechanical testing was performed after simulation test.	1	R
	-	An analysis of the data in this report indicates that all the cable (except the high temperature, designated mark WPH-1, type SROAJ-H by TVA and designated HRSR by the test report) will meet the performance requirements for intended service including 40 years installed life plus a LOCA or SLB. The HRSR cable is used with specific high temperature applications, such as the pressurizer heater. Using the Arrhenius technique and an analysis for this application indicates the cable will perform adequately for 150 service for 40 years. For 200°C service a qualified life of 5 years has been conservatively		RI
		assigned for the high temperature capability. The HRSR cables will be tasted at the end of 5 years for an aging evaluation, surveillance, and a replacement schedule.		
	c.6	It was concluded the LOCA-DBA test profile was more severe than the profile required by Figures 6.1.1 and 6.1.2 of Table 6.1.f*.	1	RI
	đ.	It is concluded from the review of these test reports that the cables will satisfactorily perform during and after MSLB-LOCA DBA's.	1	21

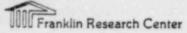
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	e licensee has not provided sufficient information to establish that the
Equ	ipment described on the SCEW sheet is the same as the Equipment describe
in	the F-C2935 report.
	The Licensee has referenced Two reports as evidence of qualification.
1	Report [4651] was a Loca test performed for TVA on a cable designated in
1	the report as CC-2i93 material. The testing demonstrates that the cable
	is qualified for the Sequoyah LOCA conditions as noted on page 3a. However
1	the preaging data was not evaluated by the Licensee's submittal for
t	the actual plant conditions.
7	The other report referenced as evidence of qualification for HELB [2818]
d	describes the cables tested as CC-2115/ CC- 1233. The licensee has not
F	rovided any anaysis of how the materials tested in [2818] are the same as
	the cables installed in the Plant.
1	

NRC Contract No. NRC-03-79-118
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FRC Task No. 579/526

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	shing similarity between i	
pelow for convenience.	outderines and the joj-/	4 which are reproduced
equipment bein for equipment specimen. Any	- The test specimen should be the same m g qualified. The type test should only identical in design and material constru deviations should be evaluated as part tion (see also Section 8.0 below).	be considered valid
	[ZSIOC
	IEEE-383 1.3.1 Cable Description. This description or specification should include as a minimum: 1.3.1.1 Conductor — material identification. size. stranding, coating. 1.3.1.2 Insulation — material identification. thickness, method of application. 1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes. extrusions. braids, or others. 1.3.1.5 Covering — jacket or metallic armor or both. material identification, thickness, method of application. 1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Splice or Connection Description or Both. This description or specification should include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembly. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.	
shoulers, joing, a of the lists sents lengt	Type Test Samples. The samples tested id contain the conductor, insulation, fill-note, binder tape, overall jacket, shieldend field spikes which are representative e cable catagory being qualified. Table 1 sizes which have been considered representive of these categories. The sample his should be sufficient to permit reliable readings and evaluation consistent with	



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Table 1 Represensentative Cables for Type Tests Type Test Section Size Up to 2000 V multiconductor control cable or Shielded multiconductor signal rable (see list below for individual component) or Single conductor power cable Single conductor power cable thermal and radiation Single conductor power cable thermal and radiation exposure design basis event singles from cable assembly vertical flame test singles from cable assembly vertical tray flame test singles from multiconductor signal cable Shielded pairs, triple or cutofrom multiconductor signal cable Coaxial, triaxial or special instrument cable temperature and moisture resistance thermal and radiation vertical flame test simulation vertic
Up to 2000 V multiconductor control cable or Shielded multiconductor signal stable (see list below for individual component) or Single conductor power cable thermal and radiation Shielded multiconductor against stable (see list below for individual component) or Single conductor power cable thermal and radiation thermal and radiation 2.3.3 1/C or M/C — 14 or 12 AWG design basis event singles from cable assembly vertical flame test 2.5.6 1/C — 14 or 12 AWG Shielded pairs, triple or cuttoff from multiconductor signal cable thermal and radiation 2.3.3 Emperature and moisture resistance design basis event simulation vertical flame test 2.5.6 Coaxial, triaxial or appendix instrument cable temperature and moisture resistance design basis event simulation 2.3.3 Emperature and moisture 2.3.1 actual size resultance design basis event 2.4 simulation 2.3.3 actual size resultance design basis event simulation 2.3.3 Emperature and moisture 2.3.1 actual size resultance design basis event 2.4 simulation 2.3.3 actual size resultance design basis event 2.4 simulation 2.3.3 actual size resultance design basis event 2.4 simulation 2.3.3 actual size resultance design basis event 2.4 simulation 2.3.3 actual size resultance design basis event 2.4 simulation 2.3.3 actual size resultance design basis event 2.4 simulation 2.3.3 actual size resultance design basis event 2.4 simulation 2.3.3 actual size resultance design basis event 2.4 simulation 2.3.3 actual size resultance design basis event 2.4 size if smaller thermal and radiation 2.3.3
control cable or Shielded nutition ductor signal cable (see list below for individual component) or Single conductor power cable Single conductor power cable thermal and radiation Single conductor power cable thermal and radiation thermal and radiation exposure design basis event asimulation vertical flame test singles from cable assembly vertical flame test 2.5.6 Shielded pairs, triple or cable assembly vertical flame test 2.5.4 Shielded pairs, triple or cable assembly vertical flame test 2.5.4 Shielded pairs, triple or cable assembly vertical flame test 2.5.4 Shielded pairs, triple or cable assembly vertical flame test 2.5.4 Coaxial, triaxial or special instrument cable temperature and moisture 2.3.1 coaxial, triaxial or special instrument cable temperature and moisture 2.3.1 coaxial, triaxial or special instrument cable temperature and moisture 2.3.1 coaxial, triaxial or special instrument cable temperature and moisture 2.3.1 coaxial, triaxial or special instrument cable temperature and moisture 2.3.1 coaxial, triaxial or special instrument cable temperature and moisture 2.3.1 coaxial, triaxial or special instrument cable temperature and moisture 2.3.1 coaxial, triaxial or special instrument cable temperature and moisture 2.3.1 coaxial, triaxial or special instrument cable temperature and moisture 2.3.1 coaxial, triaxial or setual size temperature and moisture 2.3.1 coaxial, triaxial or setual cable temperature and moisture 2.3.1 coaxial, triaxial or setual cable temperature and moisture 2.3.1 coaxial, triaxial or setual cable temperature and moisture 2.3.1 coaxial, triaxial or setual cable temperature and moisture 2.3.1 coaxial, triaxial or setual cable temperature and moisture 2.3.1 coaxial, triaxial or setual cable temperature and moisture 2.3.1 coaxial, triaxial or setual cable temperature and moisture 2.3.1 coaxial, triaxial or setual cable temperature and moisture 2.3.1 coaxial, triaxial or setual cable temperature and moisture 2.3.1 coaxial, tria
individual component) or Single conductor power cable Single conductor power cable exposure 14 or 12 AWG 1/C or M/C - 14 or 12 AWG 1/C - 6, 4 or 2 AWG 1/C - 14 or 12 AWG
Single conductor power cable design basis event simulation vertical flame test 2.5.6 1/C - 14 or 12 AWG vertical flame test 2.5.6 1/C - 14 or 12 AWG vertical tray flame test 2.5.4 7/C - 16, 14 or 12 AWG Shielded pairs, triple or temperature and moisture 2.3.1 1 pair shielded from multiconductor resistance thermal and radiation 2.3.3 exposure design basis event simulation vertical flame test 2.5.5 Coaxial, triaxial or temperature and moisture 2.3.1 actual size resistance thermal and radiation 2.3.3 exposure design basis event 2.4 simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture 2.3.1 actual size resistance thermal and radiation 2.3.3 exposure design basis event 2.4 simulation vertical flame test 2.5.6 singles from cable assembly Single pair thermocrouple temperature and moisture 2.3.1 2/C - 20 AWG or actual extension cable thermal and radiation 2.3.3
vertical flame test singles from cable assembly vertical trav flame test 2.5.4 7/C - 16, 14 or 12 AWG Shielded pairs, triple or class from multiconductor signal cable thermal and radiation exposure design basis event simulation vertical flame test 2.3.1 actual size resistance thermal and radiation 2.3.3 exposure design basis event simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture 2.3.1 actual size resustance thermal and radiation 2.3.3 exposure design basis event 2.4 simulation 2.3.3 exposure design basis event 2.4 simulation 2.3.5 exposure design basis event 2.4 simulation vertical flame test 2.5.6 singles from cable assembly 2.3.1 actual size resistance 2.3.1 actual size resistance design basis event 2.4 simulation vertical flame test 2.5.6 singles from cable assembly 2.3.1 actual size figure from cable resistance 2.3.1 actual size figure from cable actual flame test 2.5.6 single pair thermocrouple temperature and moisture 2.3.1 actual size figure from cable resistance 2.3.1 actual size figure from cable actual flame test 2.5.6 single pair thermocrouple temperature and moisture 2.3.1 actual size figure figure from cable actual size actual size actual size actual size actual size actual size figure figure from cable actual size actual
vertical flame test singles from cable assembly vertical tray flame test 2.5.4 7/C - 16, 14 or 12 AWG. Shielded pairs, triple or temperature and moisture 2.3.1 1 pair shielded 16 AWG or actual cable thermal and radiation exposure design basis event simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture 2.3.1 actual size resistance thermal and tadiation 2.3.3 exposure design basis event 2.4 simulation vertical flame test 2.5.6 Single pair thermocrouple temperature and moisture 2.3.1 2/C - 20 AWG or actual size if smaller thermal and radiation 2.3.3
Shielded pairs, triple or cate from multiconductor signal cable thermal and radiation exposure design basis event simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture resistance thermal and radiation 2.3.1 actual size resistance thermal and tadiation 2.3.3 expecial instrument cable resistance design basis event 2.4 simulation 2.3.3 exposure design basis event 2.4 simulation vertical flame test 2.5.6 Single pair thermocouple temperature and moisture extension cable temperature and moisture 2.3.1 actual size 2.5.6 singles from cable assembly 2.5.6 single pair thermocouple temperature and moisture 2.3.1 actual size 2.5.6 single pair thermocouple temperature and moisture 2.3.1 actual size 2.5.6 single pair thermocouple temperature and moisture 2.3.1 actual size if smaller thermal and radiation 2.3.3
coaxial, triaxial or sepecial instrument cable thermal and tadiation exposure design basis event simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture 2.3.1 actual size resistance thermal and tadiation 2.3.3 exposure design basis event 2.4 simulation 2.3.3 exposure design basis event 2.4 simulation vertical flame test 2.5.6 Single pair thermocrouple temperature and moisture 2.3.1 actual size resistance temperature and moisture 2.5.6 single pair thermocrouple temperature and moisture 2.3.1 actual size finaller temperature and moisture 2.3.1 actual size finaller 2.5.6 single pair thermocrouple temperature and moisture 2.3.1 actual size finaller 2.3.1 actual size finaller 2.3.1 actual size finaller 2.3.2 actual size finaller 2.3.3 actual s
signal cable thermal and radiation exposure design basis event simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture 2.3.1 actual size resistance thermal and tadiation 2.3.3 exposure design basis event 2.4 simulation vertical flame test 2.5.6 Single pair thermocrouple temperature and moisture extension cable thermal and radiation 2.3.1 actual size of smaller thermal and radiation 2.3.1 actual size of smaller temperature and moisture 2.3.1 actual size of smaller thermal and radiation 2.3.3
design basis event simulation vertical flame test 2.5.6 Constal, triaxial or temperature and moisture 2.3.1 actual size resistance thermal and tadiation 2.3.3 exposure design basis event simulation vertical flame test singles from cable assembly Single pair thermocruple temperature and moisture resistance thermal and radiation 2.3.1 2/C - 20 AWG or actual size of smaller thermal and radiation 2.3.3
Coaxial, triaxial or temperature and moisture 2.3.1 actual size resistance - thermal and radiation 2.3.3 exposure design basis event simulation vertical flame test singles from cable assembly Single pair thermocruple temperature and moisture extension cable thermal and radiation 2.3.1 2/C - 20 AWG or actual size of smaller thermal and radiation 2.3.3
special instrument cable thermal and radiation exposure design basis event simulation vertical flame test singles from cable assembly Single pair thermocouple extension cable temperature and moisture temperature and moisture extension cable thermal and radiation 2.3.3 2.4 2.5.6 2.5.6 2.5.6 2.5.6 2.6 2.70 AWG or actual size if smaller
exposure design basis event 2.4 simulation vertical flame test 2.5.6 singles from cable assembly Single pair theresocraple temperature and moisture 2.3.1 2/C - 20 AWG or actual standard and radiation 2.3.3
Single pair thermocouple temperature and moisture extension cable thermal and radiation 2.3.3
Single pair thermocruple temperature and moisture 2.3.1 2/C - 20 AWG or actual extension cable resistance size of smaller thermal and radiation 2.3.3
extension cable resistance size if smaller thermal and radiation 2.3.3
design basis event 2.4 simulation
vertical tray flame test 2.5.4
vertical flame test singles 2.5.6 from cable assembly
2001-15 000 V power cable vertical tray flame lest 2.5.4 6 AWG (2.5kV) 1/C triplexed and multiconductor 2/O or 4/O or 4/O (2-15kV)

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

EQUIPMENT ITEM NO. 81

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

ANACONDA/CONTINENTAL, MODEL NOT STATED REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 81

LICENSEE REFERENCE(S): 4405

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA & WVC)

LICENSEE SUBMITTAL: EEB-CBL-4

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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3 b, 3c, 3d
System Consideration Review	ta, 40, 40, 4d, 4e, 45
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5£ , 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7 0, 76, 70 -

NRC Contract No. NRC-03-79-118
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FRC Assignment No. 13
FRC Task No. 5/9/526

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SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
K 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 Not Established III.a Exempt III.b Not in Score
II.b Not Qualified III.b Not in Scope IV Documentation Not Available

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/566

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	M
NRC REC	QUIREMENTS	DESIGNATION: X = DEFICIENCY
Documen	nted Evidence of Qualification Adequate	-
Adequat	e Similarity Between Equipment and Test Specimen Establi	shed X
	Degradation Evaluated Adequately	-
Qualifi	led Life or Replacement Schedule Established (If Required)
Program	Established to Identify Aging Degradation	-
Criteri	a Regarding Aging Simulation Satisfied (If Required)	-
Criteri	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	-
0	Peak Pressure Adequate	-
	Duration Adequate	-
0	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
Criteri	ia Regarding Spray Satisfied	-
	ia Regarding Submergence Satisfied	-
	ia Regarding Radiation Satisfied	
	ia Regarding Test Sequence Satisfied	
Criter	ia Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	-
	ia Regarding Functional Testing Satisfied	-
	ia Regarding Instrument Accuracy Satisfied	
Test De	uration Margin (1 hour + Function Time) Satisfied	-
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGURY
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	rite
	or Replacement Schedule Justified	-
III.a	Equipment Exempt From Qualification	NAME AND ADDRESS OF THE PERSON
III.b	Equipment Not in the Scope of the Qualification Review	-
IV	Documentation Not Made Available	activities and the second

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

LICENSEE RESPONSE TO NRC SER

Anaconda - Contract 87232

- Qualification is by test as described in Franklin Institute Report F-C4836-3.
- b. The test program was based on IEEE 383-1974 and IEEE 323-1974.
- c. The test included aging at 150° C for 168 hours, gamma irradiation to 2 x 10° rads and combined steam line break and LOCA events. During testing cables were electrically energized.
- d. Cables were tested before and after thermal aging.
- e. MSLB/LOCA test environments are shown in Appendix 2. The specimens were electrically loaded and tested during simulation test.
- f. Further testing and inspection were performed after testing.
- g. It is concluded from the above tests and using the Arrhenius technique that all cables will function for at least 40 years at a continuous operating temperature of 90°C and that all cables will perform satisfactorily during and after MSLB/LOCA BBA's.
- h. It is concluded that the main steam line break test profile was more severe than the profile required by the generic envelope shown in Appendix C of NUREG 0588.

Dision of The Franklin Institute

Jith and Race Streets. Phila... Pa. 19103 (215) 448-1000

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 19 526

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quipment	descri	ibed on the SCEW sheet is	the sam	e as th	e Equipment	describe
in the re	ference	ed report.				
The ,	iona	A state				
	()					
		2. SPECIMEN DESCRI	PTION			
	Las	criptions of the cable specimens a	nd their	required e	mergizing	
	potentia	als and currents are presented in To	able 1.			
	1					
		Table 1. Cable Specimens and E	ectrical	Loading		
	CABLE SPECIMEN NUMBER	CABLE DESCRIPTION AND FORMULATION (-)(b)(c)	NOMINAL OUTSIDE DIAMETER	MEASURED OUTSIDE DIAMETER	REQUIRED ELECTRICAL LOAD'NG	
		Category 23	(in.)(c)	(in.)	(Vac/A)	
		Low Voltage Power and Control Cable 1/C No. 12 AwG 7/W Tinned Copper Conductor,				
	23.01	30-mil Flame Resistant Cross-Linked Ethy- lene Propylene Rubber Insulation (FREP), length = 30 ft.	0.160	0.158 0.158	480/25 480/25	
		Category 26 Instrumentation Cable, 2/C Ho. 16 AMG	N. A.			
		7/N Tinned Copper Conductor, 25-mil Flame Resistant Cross-Linked Ethylene Propylene				
	25.4 26.5	Rubber Insulation (FREP), Twist, Silicone/ Glass Tape, linned Copper Urain wire, Aluminum/Mylar Tape, 30-mil Chorinated Polyethylene Jacket (CPE), length = 30 ft.	0.325	0.300	480/10	
	26.5	Polyethylene Jacket (CPE), length = 30 ft.	0.325	0.300	480/10	
~ ~		a) Cable descriptions were provided by the Anch) Conductor material was copper in all cases.				157185
		c) Nominel thicknesses and diameters were prov	ided by the	client.		
			- 111			
		1 1 1 1 1 1				
20	e W	orle sheet states				
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oli						
ol		Sheet No. EEB-CBI	-4			
ol		Sheet No. EEB-CBI	L WVC ((LPE) -		

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519 526

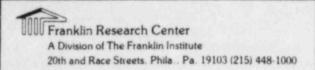
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Requirements for establishing similarity between installed and tested cab			
are contained in the DOR Guidelines and IEEE 383-74 which are reproduced			
elow for convenienc	e		
equipmen for equi specimen	t being qualified. The type test should only to pment identical in design and material construc- . Any deviations should be evaluated as part of umentation (see also Section 8.0 below).	e considered valid	
		Zsoc	
	1.3.1 Cable Description. This description or specification should include as a minimum: 1.3.1.1 Conductor — material identification. size, stranding, coating. 1.3.1.2 Insulation — material identification, thickness, method of application. 1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes, extrusions, braids, or others. 1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application. 1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Splice or Connection Description or Both. This description or specification should include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembly. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.		
	-2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, incher, 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.		

A Division of The Franklin Institute 20th and Race Streets. Phila.. Pa. 19103 (215) 448-1000 RRC Contract No. NRC-03-79-118
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E	LECTRIC CABLES, FIELD SPLI	CES, AND CONNECTIONS		Std 383-1974
		Table 1 Represensentative Cables for	r Type Tests	
	Type	Test	Section	Size
e	p to 2000 V multiconductor ontrol cable or hielded multiconsidetor	temperature and moisture resistance	2.3.1	1/C - 14 or 12 AWG
si in	gnal cable (see list below for adividual component) or	thermal and radiation exposure	2.3.3	1/C or M/C — 14 or 12 AWG
3	ingle conductor power cable	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 1/C - 14 or 12 AWG
		vertical tray flame test	2.5.4	7/C - 16, 14 or 12 AWG
5	nielded pairs, triple or use from multiconductor gnal cable	temperature and moisture resistance	2.3.1	1 pair shieided 16 AWG or actual cable
	, com constru	thermal and radiation exposure design basis event	2.3.3	
		simulation vertical flame test	2.5.6	
	ooxial, triaxial or ecial instrument cable	temperature and moisture .	2.3.1	actual size
		thermal and radiation exposure	2.3.3	
		design basis event simulation	2.4	
		vertical flame test singles from cable	2.5.6	
	ngle pair thertaocouple tension cable	temperature and moisture resistance	2.3.1	2/C - 20 AWG or actual size if smaller
	1996	thermal and radiation exposure	2.3.3	
		design basis event simulation	2.4	
		vertical tray flame test vertical flame test singles from cable assembly	2.5.4 2.5.6	
	01-15 000 V power cable C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5kV) 2/O or 4/O or 4/O (2-15kV)
_				4/O (2-15kV)
ı of	the detailed desc	cription discussed	above it	would be acceptal
		ertification from		
		the ca. s furnis		



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FRC Task No. ____5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

EQUIPMENT ITEM NO. 82

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

ROCKBESTOS, MODEL NOT STATED

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 82

LICENSEE REFERENCE(S): 1155

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-5

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED JTEM(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	la
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, 4£
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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and or will function whe environmental service conditions.	
The Licensee has presented inform outstanding qualification deficient	
The Licensee (has/has not) propositem whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by the tem.
Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by as Equipment relocation to a Qualification testing of Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW 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
II.D HOC QUALITIES	IV Documentation Not Available

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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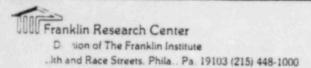
	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	<u>M</u>
		DESIGNATION:
NRC REQ	UIREMENTS	X = DEFICIENCY
ocumen	ted Evidence of Qualification Adequate	shed X
dequat	e Similarity Between Equipment and Test Specimen Establi	
ging D	egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Required	
rogram	Established to Identify Aging Degradation	
riteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	-
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	-
	a Regarding Test Sequence Satisfied	all and the second second
	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	-
rest Du	ration Margin (1 hour + Function Time) Satisfied	-
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION
IPC OUR	LIFICATION CATEGORY	X = CATEGOR
inc you		
.a	Equipment Qualified	
d.b	Equipment Qualification Pending Mcdification	or production and
I.a	Equipment Qualification Not Established	X X
I.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified	Life
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
d.III	Equipment Not in the Scope of the Qualification Review	
	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

LICENSEE RESPONSE TO NRC SER

Rockbestos - Contract 823265

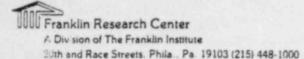
- a. Qualification is by test as described in Rockbestos report "Qualification of FIREWALL III Class 1E Cables, February 1, 1977" and "Clarification of Certain Matters Related to Class 1E Qualification of Rockbestos Cables, March 7, 1978."
- b. The test program was to demonstrate that the subject cables will function during LOCA. The test program was based on IEEE 383-1974 and IEEE 323-1974.
- c. Sampels were thermally aged for 1300 hours at 150°C. The exposure time was 450 hours longer in duration than required to simulate 40-year life. Sampels were subjected to 2 x 10° rads prior to LOCA simulation.
- d. Cables were tested before and after thermal aging.
- e. The samples were exposed to the LOCA test environments shown in Appendix 2. The specimens were electrically loaded and tested during simulation test.
- Further testing and inspection was performed after simulated LOCA testing.
- g. It is concluded from the above tests and using the Arrhenius technique that all cables will function for at least 40 years at a continuous operating temperature of 90°C and that all cables will perform satisfactorily during and after LOCA.
- h. It is concluded from the above test and from the generic envelope shown in Appendix C of NUREG 0588 that the cables will satisfactorily function during and after the postulated main steam line break.



Page 5a

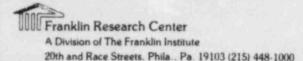
NOTES:
The licensee has not provided sufficient information to establish that the
Equipment described on the SCEW sheet is the same as the Equipment described
In the referenced report.

Requirements for establishing similarity between installed and tested cable						
are contained in the DOR Guidelines and IEEE 383-74 which are reproduced						
below for convenience.						
equipment being for equipment specimen. Any	The test specimen should be the same many qualified. The type test should only dentical in design and material constructions should be evaluated as part tion (see also Section 8.0 below).	be considered valid				
	ξ.	Lsoc				
	1.3.1 Cable Description. This description or specification should include as a minimum: 1.3.1.1 Conductor — material identification. size. stranding. Parting. 1.3.1.2 Insulation — material identification. thickness, method of application. 1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes. exclusions. braids, or others. 1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application. 1.3.1.6 Characteristics — voitage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Splice or Connection Description or Both. This description or specification should include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembly. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.					
should ers. in inc. a of the lists a senta length	ype Test Samples. The samples tested decontain the conductor, insulation, fill-leder, binder tape, overall jacket, shielded tield spikes which are representative cable category being qualified. Table 1 lizes which have been considered repretive of these categories. The sample is should be sufficient to permit reliable eadings and evaluation consistent with testing practice.					



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	ELECTRIC CABLES, FIELD SPLI			Std 382-1974
		Table 1 Represensentative Cables for	Type Tests	
-	Туре	Test	Section	Size
	Up to 2000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual component) or	temperature and moisture	2.3.1	1/C - 14 or 12 AWG
		thermal and radiation	2.3.3	1/C or M/C -
	Single conductor power cable	design basis event simulation	2.4	14 or 12 AWG 1/C or M/C — 14 or 12 AWG 1/C — 6, 4 or 2 AWG
		vertical flame test singles from cable assembly	2.5.6	1/C - 14 or 12 AWG
		vertical tray flame test	2.5.4	7/C - 16, 14 or 12 AWG
	Shielded pairs, triple or Gaze from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 16 AWC or actual cable
	rights Gibit	thermal and radiation exposure	2.3.3	
		design basis event simulation	2.4	
	Coaxial, triaxial or	vertical flame test	2.5.6	
	special instrument cable	resistance - tnermal and radiation	2.3.1	actum size
		exposure design basis event	2.4	
		simulation vertical flame test singles from cable	2.5.6	
	Single pair thermocouple extension cable	ten:perature and moisture	2.3.1	2/C - 20 AWG or actual size if smaller
		therms! and radiation exposure	2.3.3	
_		design basis event simulation	2.4	
		vertical flame test	2.5.4	
		from cable assembly		
_	2001-15 000 V power cable 1/C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5kV) 2/O or 4/O or 4/O (2-15kV)



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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519 1526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

EQUIPMENT ITEM NO. 83

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

ITT SUPERNANT, MODEL NOT STATED

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 83

LICENSEE REFERENCE(S): 6450

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-6

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	la
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	42, 4b, 4c, 40, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5b, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7a

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/hee not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not it	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment is	ration (has/has not) been provided by the tem.
Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification	
Equipment relocation above	
Relocate or shield equipme	
	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e	equipment in progress
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equip	oment item does not require qualification
and/or should be exempted from env	vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	
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 SUMMARY FORM						
	ESIGNATION:						
NRC REC	= DEFICIENCY						
Documen	Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Establishe						
Adequat	e Similarity Between Equipment and lest Specimen Database	ed _X					
Aging L	egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Required)						
Qualiti	Established to Identify Aging Degradation						
Program	a Regarding Aging Simulation Satisfied (If Required)						
Criteri	a Regarding Temperature/Pressure Exposure:						
	Peak Temperature Adequate						
	Peak Pressure Adequate						
0							
	Required Profile Enveloped Adequately	***************************************					
0	o Steam Exposure (If Required) Adequate						
Critori	a Regarding Spray Satisfied						
Criteri	a Regarding Submergence Satisfied						
	Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied						
Criter							
Critor	a Regarding Test Failures or Severe Anomalies	and the same of the					
	Any) Satisfied	The same of					
	Criteria Regarding Functional Testing Satisfied						
Criter	Criteria Regarding Instrument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied						
Test Di							
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)						
		DESIGNATION:					
NRC QUA	ALIFICATION CATEGORY	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	e					
	or Replacement Schedule Justified						
III.a	Equipment Exempt From Qualification	-					
III.D	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. 85

LICENSEE RESPONSE TO NRC SER

ITT Surprenant - Contract 84211

- a. Qualification is by test as described in Franklin Institute Report F-C3961, Isomedix Report 375-02, and ITT - Exan II Arrhenius Data.
- b. The test program was based on the guidelines of IEEE-323-1974 and IEEE-383-1974. (See Appendix 2.) The test program was to demonstrate that the subject cables will function during and after LOCA.
- c. The test specimens were subject to 2 x 10⁸ yads gamma and were aged at 150°C for 168 hours.
- d. Chemical spray was for a duration of 30 days with 3000 ppm boron at ph of 10.5 and included exposure to an environment of steam. (See Appendix 2.)
- e. The specimens were electrically energized during test.
- f. Further testing and inspection was performed after simulated LOCA testing.
- g. It is concluded from the above tests and using the Arrhenius technique that all cables will function for at least 40 years at a continuous operating temperature of 90°C and that all cables will perform satisfactorily during and after LOCA.
- h. It is concluded from the above tests and from the generic envelope shown in Appendix C of NUREG 0588 that the cables will satisfactorily function during and after the postualted main steam line break.

Page 5a

The licensee has not provided sufficient information to establish that the Equipment described on the SCEW sheet is the same as the Equipment describ				
		EW sheet is the	same as the Equipment	described
in the reference	d report.			
Tolkepart.				
		URPRENANT'S		
		EXAME II TH		
	PLAME	RETARDANT CAR	LES	
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work Sheet				
With Sheet				
				And the
		The street of th		
			Sheet No. EEB-CBL	-6
			Sheet No. EEB-CBL	
				PE) Cable
EÓUIS	PMENT QUALIFI	CATION SHEET (E	TVA ID No. WVA (XL Revision No. 2	PE) Cable
		CATION SHEET (E	TVA ID No. WVA (XL Revision No. 2	PE) Cable
			TVA ID No. WVA (XL Revision No. 2	PE) Cable
			TVA ID No. WVA (XL Revision No. 2	PE) Cable
			TVA ID No. WVA (XL Revision No. 2	PE) Cable
			TVA ID No. WVA (XL Revision No. 2	PE) Cable
			TVA ID No. WVA (XL Revision No. 2	PE) Cable
			TVA ID No. WVA (XL Revision No. 2	PE) Cable
			TVA ID No. WVA (XL Revision No. 2	PE) Cabl
			TVA ID No. WVA (XL Revision No. 2	PE) Cable

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519 526

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Requirements for establishing similarity between installed and tested cabl are contained in the DOR Guidelines and IZEE 383-74 which are reproduced						
elow for convenience.						
equipment bei for equipment specimen. An	- The test specimen should be the same mong qualified. The type test should only it identical in design and material construction of the design and material constructions should be evaluated as part of action (see also Section 8.0 below).	pe considered valid				
		ISOC				
	IEEE-383 1.3.1 Cable Description. This description or specification should include as a minimum: 1.3.1.1 Conductor — material identification. size, stranding, coating. 1.3.1.2 Insulation — material identification, thickness, method of application. 1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes, extrusions, braids, or others. 1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application. 1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Splice or Connection Description or Both. This description or specification should include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembly. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.					
shot ers. ink. of til	Type Test Samples. The samples tested aid contain the conductor, insulation, fill-jacker, binder tape, overall jacket, shield-and field spiires which are representative to cable category being qualified. Table I sizes which have been considered repretative of these categories. The sample the should be sufficient to permit reliable					

PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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Table 1 Represensentative Calvies for Type Tests Type Test Section Size Up to 2000 V multiconductor control rable or Saleided multiconductor aignal cable (see is below for individual component) or Single conductor power cable thermal and radiation 2.3.3 1/C or M/C — 14 or 12 AWG exposure design basis event singles or 1/C - 14 or 12 AWG vertical flame test 2.5.6 1/C - 14 or 12 AWG single conductor power cable Shielded pairs, triple or case from cable assembly vertical tray flame test 2.5.4 7/C — 16.14 or 12 AWG Shielded pairs, triple or case from multiconductor and radiation component of temperature and moisture resistance design basis event simulation Emperature and moisture 2.3.1 1 pair shielded 16 AWG or actual cable thermal and radiation exposure design basis event simulation exposure design basis event 2.4 simulation exposure design basis event 2.4 simulation exposure design basis event 3.3.1 actual size resistance thermal and radiation exposure design basis event simulation exposure design basis eve	ELECTRIC CABLES, FIELD S	PLICES, AND CONNECTIONS		Std 383-1974
Type Test Section Size Up to 2003 V multiconductor control cable or Shielded multiconductor signal cable (see his bloow for individual component) or Single conductor power cable Shielded pairs, triple or cutoff from multiconductor signal cable. Shielded pairs, triple or cutoff from multiconductor signal cable. Shielded pairs, triple or cutoff from multiconductor signal cable. Coaxial, triaxial or special instrument cable simulation wertical flame test simulation wertical flame test simulation. Coaxial, triaxial or special instrument cable simulation wertical flame test simulation sexposure design basis event simulation. Single pair thertaocouple extension cable temperature and moisture resistance chermal and radiation exposure design basis event simulation wertical flame test singles from cable assembly size of			r Type Tests	
control cable or Shielded autitionidustor signal cable tase fist below for individual component) or Single cenductor power cable thermal and radiation 2.3.3 1/C or M/C — 14 or 12 AWG 1/C — 6, 4 or 2 AWG 1/C — 6, 4 or 2 AWG 1/C — 14 or 12 AWG 1/C — 15 AWG 0/C	Туре			
individual component) or Single cenductor power cable Single cenductor power cable 2.4 1/C or M/C 1/C or AWG 1/C - 6, 4 or 2 AWG 1/C - 6, 4 or 12 AWG 1/C - 14 or 12 AWG 1/C - 1	Control cable or Saielded multiconductor		2.3.1	1/C - 14 or 12 AWG
simulation 14 or 12 AWG 1/C - 6, 4 or 2 AWG 1/C - 14 or 12 AWG singles from cable assembly vertical tray flame test 2.5.4 7/C - 16, 14 or 12 AWG 5hielded pairs, triple or case from multiconductor resistance thermal and radiation 2.3.1 1 pair shielded 16 AWG or actual cable thermal and radiation 2.3.3 exposure design basis event simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture 2.3.1 actual size resistance thermal and radiation 2.3.3 exposure design basis event 2.4 simulation vertical flame test 2.5.6 single pair thermocraphe extension cable temperature and moisture 2.5.6 single pair thermocraphe extension cable temperature and moisture resistance design basis event 2.4 exposure design basis event 2.5.4 vertical flame test singles from cable assembly 2.5.6 from cable assembly 2.5.6 from cable assembly 2.5.6 from cable assembly 2.5.6 from cable assembly vertical tray flame test singles 2.5.6 from cable assembly vertical tray flame test singles 2.5.6 from cable assembly vertical tray flame test singles 2.5.4 for AWG (2.5kV) 2/O or 4/O or	individual component) or	exposure		14 or 12 AWG
singles from cable assembly vertical tray flame test 2.5.4 7/C - 16, 14 or 12 AWG Shielded pairs, triple or curical tray flame test 2.3.1 1 pair shielded 16 AWG or actual cable thermal and radiation exposure design basis event simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture 2.3.1 actual size resistance thermal and radiation 2.3.3 exposure design basis event 2.4 simulation 2.3.3 exposure design basis event 2.4 simulation vertical flame test 2.5.6 Single pair thermocruple temperature and moisture resistance thermal and radiation 2.3.3 exposure design basis event 2.4 singles from cable assembly 2.3.1 actual size of smaller thermal and radiation 2.3.3 exposure design basis event 2.4 simulation 2.3.3 exposure design basis event 2.4 simulation 2.3.3 exposure design basis event 2.4 simulation vertical flame test singles from cable assembly 2.5.6 from cable assembly vertical flame test singles from cable assembly vertical tray flame test singles from cable assembly vertical tray flame test 2.5.4 6 AWG (2.5kV) 1/C triplexed and multiconductor		simulation		14 or 12 AWG 1/C - 6, 4 or 2 AWG
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resistance thermal and radiation 2.3.3 response design basis event simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture 2.3.1 actual size resistance thermal and radiation 2.3.3 response design basis event 2.4 simulation 2.3.3 response 2.5.6 simulation vertical flame test 2.5.6 simulation vertical flame test 3.3.1 actual size resistance 2.4 simulation vertical flame test 3.3.1 actual size resistance 2.5.6 simulation vertical flame test 3.3.1 actual size if smaller thermal and radiation 2.3.3 response design basis event 3.3.1 actual size if smaller 2.5.6 simulation 2.3.3 response design basis event 3.3.1 actual size if smaller 2.5.6 response design basis event 3.3.1 actual size if smaller 2.5.6 response 2.5.6 response design basis event 3.3.1 actual size if smaller 2.5.4 response 2.5.6 response design basis event 3.3.1 actual size if smaller 2.5.4 response 2.5.6 re		vertical tray flame test	2.5.4	7/C - 16, 14 or 12 AWG
exposure design basis event simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture special instrument cable thermal and radiation exposure design basis event simulation vertical flame test simples from cable simples from cable Single pair thermocrouple extension cable temperature and moisture resistance temperature and moisture resistance thermal and radiation exposure design basis event simulation vertical flame test singles from cable resistance thermal and radiation exposure design basis event simulation vertical flame test vertical flame test vertical flame test singles from cable assembly vertical flame test 2.5.4 6 AWG (2-5kV) 2/O or 4/O or	5 436 from multiconductor	resistance		
Simulation vertical flame test 2.5.6 Coaxial, triaxial or temperature and moisture 2.3.1 actual size resistance thermal and radiation 2.3.3 exposure design basis event simulation vertical flame test singles from cable assembly Single pair thermocouple temperature and moisture resistance thermal and radiation 2.3.3 exposure design basis event simples from cable resistance thermal and radiation 2.3.3 exposure design basis event simulation vertical tray flame test 2.5.4 vertical flame test singles 2.5.6 from cable assembly 2001-15 000 V power cable vertical tray flame test 2.5.4 6 AWG (2-5kV) 1/C triplexed and multiconductor	The state of the s	exposure		
Coaxial, triaxial or special instrument cable resistance temperature and moisture 2.3.1 actual size resistance thermal and radiation 2.3.3 exposure design basis event simulation vertical flame test singles from cable assembly Single pair thermocraple temperature and moisture resistance thermal and radiation 2.3.3 exposure design basis event simulation vertical flame test singles from cable assembly 2.4 simulation 2.3.1 2/C - 20 AWG or actual size if smaller thermal and radiation 2.3.3 exposure design basis event simulation vertical tray flame test 2.5.4 vertical flame tost singles from cable assembly 2.5.6 from cable assembly vertical tray flame test 2.5.4 6 AWG (2-5kV) 1/C triplexed and multiconductor		simulation		
exposure design basis event simulation vertical flame test singles from cable Single pair thermocrouple extension cable temperature and moisture resistance thermal and radiation exposure design basis event simulation vertical tray flame test vertical flame test singles from cable assembly 2.5.4 vertical tray flame test 1/C triplexed and multiconductor exposure design basis event simulation vertical tray flame test vertical flame test singles from cable assembly 2.5.4 2.5.4 2.5.4 2.5.6 6 AWG (2.5kV) 2/O or 4/O or		temperature and moisture	THE RESERVE AND ADDRESS OF THE PARTY OF THE	actua: size
Single pair thermocruple temperature and moisture resistance thermal and radiation exposure design basis event simulation vertical flame test vertical tray flame test vertical		thermal and radiation	2.3.3	
Single pair thermocrouple temperature and moisture temperature and moisture resistance thermal and radiation exposure design basis event simulation vertical tray flame test 2.5.4 vertical flame test singles assembly 2:001-15 000 V power cable vertical tray flame test 2.5.4 (2.5kV) 1/C triplexed and multiconductor		simulation		
extension cable resistance thermal and radiation exposure design basis event simulation vertical tray flame test vertical flame tost singles from cable assembly 2:01-15 000 V power cable 1/C triplexed and multiconductor resistance size if smaller 2.3.3 2.5.4 2.5.4 vertical tray flame test 2.5.4 vertical tray flame test 2.5.4 6 AWG (2-5kV) 2/O or 4/O or		singles from cable	2.5.6	
exposure design basis event simulation vertical tray flame test vertical flame test singles from cable assembly 2:001-15 000 V power cable vertical tray flame test vertical tray flame test vertical tray flame test vertical tray flame test 2:5.4 6 AWG (2:5kV) 2/O or 4/O or			5.3.1	
vertical tray flame test 2.5.4 vertical flame test ingres 2.5.6 from cable assembly 2001—15 000 V power cable vertical tray flame test 2.5.4 6 AWG (2-5kV) 1/C triplexed and multiconductor 2/O or 4/O or		exposure		
vertical flame test ringles from cable assembly 2:5.6 2:001-15 000 V power cable vertical tray flame test 2:5.4 6 AWG (2:5kV) 1/C triplexed and multiconductor 2/O or 4/O or		simulation		
1/C triplexed and multiconductor 2/O or 4/O or		vertical flame test singles		
	2001-15 000 V power cable 1/C triplexed and multiconducto		2.5.4	2/O or 4/O or
				4/0 (2-15xV)
licensee to obtain certification from the manufacturer identify		to the capies furnis	sned for j	installation.
st report(s) apply to the cables furnished for installation.				

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _5/1/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

EQUIPMENT ITEM NO. 84

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

BRAND REX, MODEL NOT STATED

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 84

LICENSEE REFERENCE(S): 936

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVC(XLPE))

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-7

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	la
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, 40, 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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
✓ The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not has	ed a corrective action for this equipment been fully established.
Justification for interim oper Licensee for this equipment is	ration (has/has not) been provided by the tem.
Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by acceptance of the companion o	e submergence level ent from radiation source dditional (testing/analysis) mild environment
Qualification testing of e	equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from environment	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/524

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQ	UIREMENTS	DESIGNATION: X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	alished *
Adequat	e Similarity Between Equipment and Test Specimen Estab	olished
Aging D	egradation Evaluated Adequately	red)
Qualifi	ed Life or Replacement Schedule Established (If Require	
Program	Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Aging Simulation Satisfied (if Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
0	Required Profile Enveloped Adequately	-
0	Steam Exposure (If Required) Adequate	
Criteri	a Regarding Spray Satisfied	
Criteri	a Regarding Submergence Satisfied	
Criteri	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NDC OUR	ALIFICATION CATEGORY	X = CATEGORY
NAC OUR	ALIFICATION CAISONI	
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 Qualifie	d Life
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Revi	ew
IV	Documentation Not Made Available	

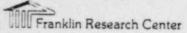
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

LICENSEE RESPONSE TO NRC SER

Brand-Rex - Contract No. 822000

- a. Qualification is by test as described in Franklin Institute Report F-C4113 and Brand-Rex Long Term Thermal Aging - Arrhenius Plot, May 30, 1978.
- The test program was based on the guidelines of IEEE-383-1974. The test program was local demonstrate that the subject cables will function during the cables were aged for seven days at 136° C and then irradiated to
- 2 x 10° RADS, prior to steam/chemical spray test. Test was performed on the specimens after irradiation.
- d. The cables were exposed to a steam/chemical spray environment for 30 days (see Appendix 2). Throughout this time, the cables were sprayed with a H2BO2 (3000 ppm boron) solution buffered to a PH of 10.0 to 10.5.
- e. During the entire steam/chamical spray exposure the conductors were energized and tested.
- f. Further testing and inspection was performed after simulated LOCA testing.
- It is concluded from the above tests and using the Arrhenius technique that all cables will function for at least 40 years at a continuous operating temperature of 90°C and that all cables will perform satisfactorily during and after LOCA.
- h. It is concluded from the above tests and from the generic envelope shown in Appendix C of NUREG 0588 that the cables will satisfactorily function during and after the postulated main steam line break.



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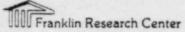
Page 5a

aysut	erenced report.			
		Sample ₂	No. of Conductors	Wire Size (AMG)
	12 AWG (19/.0185) bare copper insulated with 30 mils nominal (27 mils minimum) of Brand-Rex electron cured, flame retardant, moisture resistant, cross-linked polyethylene insulation, rated 600 Volts.	1 2	' '	12
	16 AWG (19/.0117) bare copper insulated with 25 mils nominal (22.5 mils minimum) of Brand-Rex electron cured, flame retardant, moisture resistant, cross-linked polyethylene insulation, rated. 600 Volts.	3	1	16
	16 AMG (19/.0117) bare copper insulated with 15 mils nominal (13.5 mils minimum) of Brand-Rax electron cured, flame retardant, moisture resistant, cross-linked polyethylene insulation, rated 300 Volts.	5	JH 1	16
	12 AMT (19/.0185) bare copper insulated with 30 mils nominal (27 mils minimum) of Brand-Rex electron cured, flame retardant, moisture resistant, cross-linked polyethylane insulation, rated 600 Volts.	7	1	12
	7 Conductor, 12 ANG (19/.0185) bare copper insulated with 30 mils nominal (27 mils minimum) of Brand-Rex electron cured, flame retardant, moisture resistant, cross-linked polyathylene insulation, retad 600 Volts, cabled with an asbestos/polyaster flame barrier tape, jacketed with 60 mils nominal (48 mils minimum) flame-retardant black neoprene.	9 10 11	7	12
		nd-Rex		
vorks	heet			
	WYC IXLPE)			

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NOTES:	
Requirements for establishing	g similarity between installed and tested cables
	delines and IEEE 383-74 which are reproduced
below for convenience.	
	test specimen should be the same model as the
	ified. The type test should only be considered valid cal in design and material construction to the test
specimen. Any devi	tions should be evaluated as part of the qualifica-
	[DOIS]
specificat ficat ficat only ducto braid mor ness. temp For atten phon 1 trade 1.3 or B shoul bled t 1 mate	I Cable Description. This description or feation should include as a minimum: 3.1.1 Conductor — material identimal size, stranding, coating. 3.1.2 Insulation — material identimal thickness, method of application. 3.1.3 Assembly (multiconductor cables — number and arrangement of constitutions). 3.1.4 Shielding — tapes, extrusions. 3.1.5 Covering — jacket or metallic arms both, material identification, thickneshed of application. 3.1.6 Characteristics — voltage and rature rating (normal and emergency). Instrumentation cables — capacitance, instrumentation cables — capacitance, microes, insulation resistance, as applicable. 3.1.7 Identification — manufacturer's name, catalog number. 2 Field Splice or Connection Description th. This description or specification include as a minimum: 3.2.1 Whether factory or field assemballe. 3.2.2 Conductor connection — type, all identification, and method of assemballe. 3.2.3 Items from Sections 1.3.1.2 th 1.3.1.7.
should corers, jacker ing, and ti of the cab	l'est Samples. The samples tested tain the conductor, insulation, fill-binder tape, overall jacket, shield-ld spikes which are representative e category heing qualified. Table 1
sentative lengths sh	which have been considered repre- of these caregories. The sample ould be sufficient to permit reliable gs and evaluation consistent with g practice.



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FRC Task No. __5/9/52-6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

EQUIPMENT ITEM NO. 85
ELECTRICAL CABLE LOCATED OUTSIDE CONTAINMENT
ITT SUPERNANT MODEL TRIAXIAL

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 85

LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): INSTRUMENT CABLE

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-8

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,

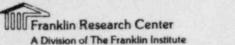
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4a, 4d, 4a, 4£
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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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 III.a Exempt III.b Not Qualified IV Documentation Not Available



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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUBMENT POLES	
		ESIGNATION:
NRC REC	UIREMENTS	= DEFICIENCY
Documen	ated Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establish	ed
	Degradation Evaluated Adequately	
Oualifi	led Life or Replacement Schedule Established (If Required)	
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	-
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	-
	Peak Pressure Adequate	
	Duration Adequate	-
	Required Profile Enveloped Adequately	-
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	-
	la Regarding Submergence Satisfied	-
	a Regarding Radiation Satisfied	-
Criter	ia Regarding Test Sequence Satisfied	
Criteri	la Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	-
Criteri	a Regarding Functional Testing Satisfied	
Criter	ia Regarding Instrument Accuracy Satisfied	
Test De	uration Margin (1 hour + Function Time) Satisfied	-
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NDC OIII	ALTELCATION CAMECORY	X = CATEGORY
	ALIFICATION CATEGORY	A CHILDREN
MAC QUA		
I.a	Equipment Qualified	
	Equipment Qualification Pending Modification	=
I.a	Equipment Qualification Pending Modification Equipment Qualification Not Established	=
I.a I.b	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified	-
I.a I.b II.a II.b	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life	-
I.a I.b II.a	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Lifer Replacement Schedule Justified	-
I.a I.b II.a II.b	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life of Replacement Schedule Justified Equipment Exempt From Qualification	fe
I.a I.b II.a II.b II.c	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Lifer Replacement Schedule Justified	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

LICENSEE RESPONSE TO NRC SER

ITT Surprenant - Contract 84595

- a. Qualification is by test as described in ITT Surprenant Report ITT DAB-310-BAA (See Appendix 2).
- b. Three (3) specimens were unirradiated, (3) irradated at 1 x 10⁸ rads and 3 irradiated at 2 x 10° rads.
- c. All specimens were subjected to a 10-day steam/chemical spray.
- d. These cables are assigned category d. Category d equipment will not experience the environmental conditions of design basis accidents but are qualified to demonstrate operability under the expected extremes of its non-accident service environment. It is concluded from the above test that the cables will perform satisfactorily for category d requirements with a qualified life of 40 years.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

SYSTEM CONSIDERATION REVIEW

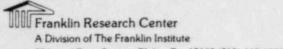
The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. Licensee's rationale has been evaluated and the reasons for concurrence/ non-sensurrence with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

- Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- X Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

EQUIPMENT ITEM NO. 86

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

GENERAL ELECTRIC MODEL VULKENE

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 86

LICENSEE REFERENCE(S): 4764

FUNCTION (PLANT ID): CONTROL & INSTRUMENTATION (CPJ)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-9

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

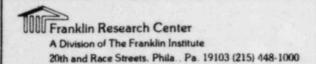
R, T, QT, RT, P, H, CS, A) S, (R) M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.	
Equipment Item	la	
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, 4c, 4£	
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5c, 5£ , 5g, 5h, 5i, 5j	
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b	
Maintenance and Replacement Schedule Summary	7a 7b 7a	

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	led a response to the SER concerns.
The Licensee (has/has not) specific qualified and/ar will function when environmental service conditions.	en exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided by the tem.
Corrective action specified b	y the Licensee:
Equipment replacement wit Equipment modification Equipment relocation abov Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of Other (re submergence level ment from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established II.b Not Qualified	



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FRC Assignment No. 13
FRC Task No. 5/9/526

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
		DESIGNATION:	
NRC REC	QUIREMENTS	X = DEFICIENCY	
	ted Deidens of Ouglification Magnata		
	nted Evidence of Qualification Adequate te Similarity Between Equipment and Test Specimen Establi	shed	
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)		
Criteri	ia Regarding Temperature/Pressure Exposure:		
	Peak Temperature Adequate		
	Peak Pressure Adequate		
	Duration Adequate		
	Required Profile Enveloped Adequately		
	Steam Exposure (If Required) Adequate		
	ia Regarding Spray Satisfied		
	ia Regarding Submergence Satisfied		
	ia Regarding Radiation Satisfied		
	ia Regarding Test Sequence Satisfied		
	ia Regarding Test Failures or Severe Anomalies		
	Any) Satisfied		
	ia Regarding Functional Testing Satisfied		
	ia Regarding Instrument Accuracy Satisfied		
Test Du	uration Margin (1 hour + Function Time) Satisfied		
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)		
una	ATTERCATION CAMPCODY	DESIGNATION: X = CATEGORY	
NRC QUA	ALIFICATION CATEGORY	A - CATEGORI	
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 I	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. 84

LICENSEE RESPONSE TO NRC SER

CPSJ, CPJ, CPJJ, PXJ, PXMJ CABLE

The CP family of cables consists of cross-linked polyethylene insulation and polyvinyl-chloride jacketing, and the PX family of cables consists of cross-linked polyethylene or ethylene propylene rubber, and the jacket is chlorosulfonated-polyethylene or chlorinated-polyethylene. The following LOCA/SLB tests apply:

- → CP types Wyle Laboratory Test Report 43854-3 dated April 26, 1978, Qualification Test on eight cable splice Assemblies (cable assemblies comprised of CPJ cable). (See appendix 2)
 - PX types Franklin Institute Test Report F-C4113 dated May 1975.
 - Rockbestos Company Test Report dated July 1977, amended 1979.
 - Franklin Institute Test Report F-C5120 dated May 1980.

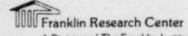
Test report 43854-3 shows a baseline functional test was first performed and passed. Then functional tests were performed and passed after the radiation test, after the temperature aging test, and after the LOCA/SLB test.

The tests included radiation at 6.9 x 107 rads.

The tests included temperature aging at 250°F for 168 hours.

The tests included a LOCA/SLB at 325°F, 55 psig, 100 percent humidity.

These cables have a qualified lifetime of 40 years and are qualified by the above for all HELB areas. Because of the conservatism of these tests including the severity of the mandrel bend and dielectric test in water after the combined LOCA/SLB profile, engineering analysis concludes that there is sufficient margin to give reasonable assurance of continued operation for more than a year in the post design basis event environment.



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E47647 applessives to TVA calle policide
invelopes the required accedent
profiles
TEST ITEM AND TEST EQUIPMENT DESCRIPTION
Test Item Description
Four (4) each of two (2) different types of Cable Splice Assemblies were tested during this test program. Both types were fabricated by TVA personnel and are to be used inside containment at Browns Ferry Nuclear Generating Station, Unit 3.
The two types of Cable Splice Assemblies are described as follows:
The 480 VAC Cable Splice Assembly consists of four (4) single cables of No. 10 CPJ wire, spliced to four (4) single cables of No. 12 Vulkene insulated wire, spliced to four (4) single cables of No. 10 CPJ wire. Five (5) of these assemblies were fabricated. Only four (4) were tested. One (1) Assembly was a spare.
The 250 VDC Cable Splice Assembly consists of a seven (7)-conductor cable, wire size No. 10, with CPJJ insulation, spliced to seven (7) single conductor cable, wire size No. 10, with CPJJ insulation.

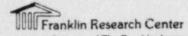
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response to the SER concerns.
ly stated that the equipment is sposed to the applicable DBE
which shows there are no
corrective action for this equipment fully established.
on (has/has not) been provided by the
Licensee:
mergence level from radiation source conal (testing/analysis) l environment ment in progress
formation for this equipment item or justification for interim
d a schedule for the proposed accomplishing the corrective
item does not require qualification mental qualification.
EVALUATION CATEGORY BASED ON REVIEW is TER for Legend)
.c Qualified Life Deficiency I.a Exempt
I.b Not in Scope Documentation Not Available

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM			
		DESIGNATION: X = DEFICIENCY		
NRC REC	QUIREMENTS	A - DEFICIENCE		
Documen	ated Evidence of Qualification Adequate			
Adequat	e Similarity Between Equipment and Test Specimen Establi	ished		
Aging I	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)			
Qualifi				
Program				
Criteri				
Criteri	a Regarding Temperature/Pressure Exposure:			
0	Peak Temperature Adequate			
	Peak Pressure Adequate			
	Duration Adequate			
0	Required Profile Enveloped Adequately	-		
	Steam Exposure (If Required) Adequate	-		
	ia Regarding Spray Satisfied			
	ia Regarding Submergence Satisfied	-		
	ia Regarding Radiation Satisfied	-		
Criteri	ia Regarding Test Sequence Satisfied			
Criteri	ia Regarding Test Failures or Severe Anomalies			
	Any) Satisfied	-		
Criteri	ia Regarding Functional Testing Satisfied			
Criter	ia Regarding Instrument Accuracy Satisfied			
Test Du	uration Margin (1 hour + Function Time) Satisfied			
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)			
		DESIGNATION: X = CATEGORY		
NRC QUA	ALIFICATION CATEGORY	A - CHIEGORI		
I.a	Equipment Qualified	X		
I.b	Equipment Qualification Pending Modification	<u>×</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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- [4764] applewires to TVA calle polich
in elope the required accident
profiles
TEST ITEM AND TEST EQUIPMENT DESCRIPTION
Test Item Description
Four (4) each of two (2) different types of Cable Splice Assemblies were tested during this test program. Both types were fabricated by TVA personnel and are to be used inside containment at Browns Ferry Nuclear Generating Station, Unit 3.
The two types of Cable Splice Assemblies are described as follows:
The 480 VAC Cable Splice Assembly consists of four (4) single cables of No. 10 CPJ wire, spliced to four (4) single cables of No. 12 Vulkene insulated wire, spliced to four (4) single cables of No. 10 CPJ wire. Five (5) of these assemblies were fabricated. Only four (4) were tested. One (1) Assembly was a spare.
The 250 VDC Cable Splice Assembly consists of a seven (7)-conductor cable, wire size No. 10, with CPJJ insulation, spliced to seven (7) single conductor cable, wire size No. 10, with CPJJ insulation.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

EQUIPMENT ITEM NO. 87

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

INSTRUMENT CABLE, MODEL NOT STATED REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 87

LICENSEE REFERENCE(S): 4764

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-10

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	la
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 Project No. C5257
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FRC Task No. 5/9/52 C

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SUMMARY OF LICENSEE RESPONSES TO THE	HE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
★ The Licensee (has/has not) prov	vided a response to the SER concerns.
	cifically stated that the equipment is when exposed to the applicable DBE
The Licensee has presented info	
The Licensee (has/has not) propitem whose qualification has no	posed a corrective action for this equipment of been fully established.
Justification for interim of Licensee for this equipment	operation (has/has not) been provided by the titem.
Corrective action specified	by the Licensee:
Verify qualification by Equipment relocation to	oove submergence level ipment from radiation source y additional (testing/analysis)
	other information for this equipment item basis for justification for interim
	provided a schedule for the proposed ale for accomplishing the corrective)
The Licensee states that the eq	quipment item does not require qualification environmental qualification.
DESIGNATION OF RESULTANT NRC QUALIF - CIRCLED ITEM ONLY: (See Section	FICATION EVALUATION CATEGORY BASED ON REVIEW 3 of this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available

III.a

III.b

IV

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 _<u>*</u> I.a Equipment Qualified Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification

Equipment Not in the Scope of the Qualification Review

Documentation Not Made Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

LICENSEE RESPONSE TO NRC SER

CPSJ, CPJ, CPJJ, PXJ, PXMJ CABLE

The CP family of cables consists of cross-linked polyethylene insulation and polyvinyl-chloride jacketing, and the PX family of cables consists of cross-linked polyethylene or ethylene propylene rubber, and the jacket is chlorosulfonated-polyethylene or chlorinated-polyethylene. The following LOCA/SLB tests apply:

- CP types Wyle Laboratory Test Report 43854-3 dated April 26,
 1978, Qualification Test on eight cable splice Assemblies
 (cable assemblies comprised of CPJ cable). (See appendix 2)
 - PX types Franklin Institute Test Report F-C4113 dated May 1975.
 - Rockbestos Company Test Report dated July 1977, amended 1979.
 - Franklin Institute Test Report F-C5120 dated May 1980.

Test report 43854-3 shows a baseline functional test was first performed and passed. Then functional tests were performed and passed after the radiation test, after the temperature aging test, and after the LOCA/SLB test.

The tests included radiation at 6.9 x 107 rads.

The tests included temperature aging at 250°F for 168 hours.

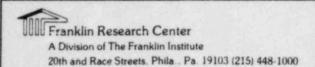
The tests included a LOCA/SLB at 325°F, 55 psig, 100 percent humidity.

These cables have a qualified lifetime of 40 years and are qualified by the above for all HELB areas. Because of the conservatism of these tests including the severity of the mandrel bend and dielectric test in water after the combined LOCA/SLB profile, engineering analysis concludes that there is sufficient margin to give reasonable assurance of continued operation for more than a year in the post design basis event environment.

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	11		, -	ich
547647 applicable to TVA calle which				
profiles			ALL VINCE	
0				
TEST ITEM AND TEST	T EQUIPMENT DES	CRIPTION		
Test Item Descrip	tion			
tested during this	to be used ins	Both types were ide containment as	fabricated by TV	/A
		rati lies are descr	then as follows:	
The two types of	LABIC SCIICE ME		ince do inciono:	
The two types of t				
The 460 VAC Cable	Splice Assum!	y consists of four	(b) single cabl	es
The 460 VAC Cable of No. 10 CPJ wire insulated wire, sp	Splice Assemble, splice of four	y consists of four four (4) single cab (4) single cables	les of No. 12 Vu	ikene
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these	Splice Assemble, splice of four assembles wer	y consists of four	les of No. 12 Vu	ikene
The 460 VAC Cable of No. 10 CPJ wire insulated wire, sp	Splice Assemble, splice of four assembles wer	y consists of four four (4) single cab (4) single cables	les of No. 12 Vu	ikene
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable	Splice Assemble, splice rour assembles were assembles were spare.	y consists of four four (4) single cables (4) single cables a febricated. Only	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto	ire.
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable cable, wire size in	Splice Assemble, splice four assembles were assembles were seas a spare. Splice Assemble CP	y consists of four four (4) single cables (4) single cables a febricated. Only consists of a self-	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto iced to seven (7	ire.
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable cable, wire size in	Splice Assemble, splice four assembles were assembles were seas a spare. Splice Assemble CP	y consists of four four (4) single cables (4) single cables a febricated. Only	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto iced to seven (7	ire.
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable cable, wire size in	Splice Assemble, splice four assembles were assembles were seas a spare. Splice Assemble CP	y consists of four four (4) single cables (4) single cables a febricated. Only consists of a self-	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto iced to seven (7	ire.
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable cable, wire size in	Splice Assemble, splice four assembles were assembles were seas a spare. Splice Assemble CP	y consists of four four (4) single cables (4) single cables a febricated. Only consists of a self-	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto iced to seven (7	ire.
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable cable, wire size in	Splice Assemble, splice four assembles were assembles were seas a spare. Splice Assemble CP	y consists of four four (4) single cables (4) single cables a febricated. Only consists of a self-	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto iced to seven (7	ire.
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable cable, wire size in	Splice Assemble, splice four assembles were assembles were seas a spare. Splice Assemble CP	y consists of four four (4) single cables (4) single cables a febricated. Only consists of a self-	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto iced to seven (7	ire.
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable cable, wire size in	Splice Assemble, splice four assembles were assembles were seas a spare. Splice Assemble CP	y consists of four four (4) single cables (4) single cables a febricated. Only consists of a self-	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto iced to seven (7	ire.
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable cable, wire size in	Splice Assemble, splice four assembles were assembles were seas a spare. Splice Assemble CP	y consists of four four (4) single cables (4) single cables a febricated. Only consists of a self-	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto iced to seven (7	ire.
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable cable, wire size in	Splice Assemble, splice four assembles were assembles were seas a spare. Splice Assemble CP	y consists of four four (4) single cables (4) single cables a febricated. Only consists of a self-	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto iced to seven (7	ire.
The 460 VAC Cable of No. 10 CPJ wird insulated wire, sprive (5) of these Cne (1) Assembly to The 250 VDC Cable cable, wire size in	Splice Assemble, splice four assembles were assembles were seas a spare. Splice Assemble CP	y consists of four four (4) single cables (4) single cables a febricated. Only consists of a self-	of No. 12 Vu of No. 10 CPJ wi y four (4) were even (7)-conducto iced to seven (7	ire.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

EQUIPMENT ITEM NO. 88

ELECTRICAL CABLE LOCATED INSIDE/OUTSIDE CONTAINMENT

MANUFACTURER AND MODEL NOT STATED REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 88

LICENSEE REFERENCE(S): 4764

FUNCTION (PLANT ID): INSTRUMENT CABLE (CPST)
LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-11

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEX (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,

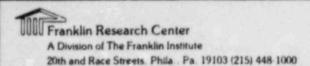
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4c, 45
Equipment Environmental Qualification Review	5a, 5 b, 5c, 5d, 5e, 5£, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b.
Maintenance and Replacement Schedule Summary	Ja, 75, 7s-

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
The Licensee (has/hae not) provid	led a response to the SER concerns.
7,	
X The Licensee (has/has not) specif	ically stated that the equipment is
qualified and/or will function wh	en exposed to the applicable DBE
environmental service conditions.	
V The Licenses has exceeded inform	ustion which shows there are no
The Licensee has presented inform outstanding qualification deficie	
outstanding qualification deficie	ncies.
The Licensee (has/has not) propos	ed a corrective action for this equipment
item whose qualification has not	
Justification for intaria ope	ration (has/has not) been provided by the
Licensee for this equipment i	
Corrective action specified b	y the Licensee:
Equipment replacement with Equipment modification	h qualified equipment
Equipment relocation above	auhmorgaco level
Relocate or shield equipm	
	dditional (testing/analysis)
Equipment relocation to a	mild environment
Qualification testing of	equipment in progress
Other ()
The Licensee has provided oth	er information for this equipment item
	sis for justification for interim
operation.	are for justification for interim
있는데 교육대통령의 이번 바람들이 없었다.	
	for accomplishing the corrective
action	• '
The Licensee states that the equi	pment item does not require qualification
and/or should be exempted from en	
CONTRACTOR OF THE PROPERTY OF	THE RESIDENCE OF THE PROPERTY
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
M.a Qualified	II.c Qualified Life Deficiency
I.b Modification	
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available
The Licensee (has/has not) procedure action The Licensee states that the equipand/or should be exempted from end DESIGNATION OF RESULTANT NRC QUALIFICATION ONLY: (See Section 3 of the Company of	of this TER for Legend) II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope



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FRC Assignment No. 13
FRC Task No. 5/9/5 26

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
		ESIGNATION:
NRC REC	QUIREMENTS X	= DEFICIENCY
Documen	nted Evidence of Qualification Adequate	. —
	te Similarity Between Equipment and Test Specimen Establish	ed
Aging D	Degradation Evaluated Adequately	-
	led Life or Replacement Schedule Established (If Required)	
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
0	西南南部 西南南南南南 Table Tab	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfies	-
	ia Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	-
Criteri	ia Regarding Test Sequence Satisfied	-
	ia Regarding Test Failures or Severe Anomalies	
	Any) Satisied	
	a Regarding Functional Testing Satisfied	
Criteri	ia Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NDC OU	AT TRICATION CATECORY	X = CATEGORY
NRC QUA	ALIFICATION CATEGORY	A - 0112200112
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	-
	Equipment Not Qualified	
II.b		
II.b	Equipment Satisfies All Requirements Except Qualified Life	e
	Equipment Satisfies All Requirements Except Qualified Lift or Replacement Schedule Justified	e
II.b	or Replacement Schedule Justified	e
TI.c		

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/52-6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

LICENSEE RESPONSE TO NRC SER

CPSJ, CPJ, CPJJ, PXJ, PXMJ CABLE

The CP family of cables consists of cross-linked polyethylene insulation and polyvinyl-chloride jacketing, and the PX family of cables consists of cross-linked polyethylene or ethylene propylene rubber, and the jacket is chlorosulfonated-polyethylene or chlorinated-polyethylene. The following LOCA/SLB tests apply:

- CP types Wyle Laboratory Test Report 43854-3 dated April 26, 1978, Qualification Test on eight cable splice Assemblies (cable assemblies comprised of CPJ cable). (See appendix 2)
 - PX types Franklin Institute Test Report F-C4113 dated May 1975.
 - Rockbestos Company Test Report dated July 1977, amended 1979.
 - Franklin Institute Test Report F-C5120 dated May 1980.

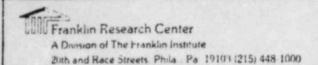
Test report 43854-3 shows a baseline functional test was first performed and passed. Then functional tests were performed and passed after the radiation test, after the temperature aging test, and after the LOCA/SLB test.

The tests included radiation at 6.9 x 107 rads.

The tests included temperature aging at 250°F for 168 hours.

The tests included a LOCA/SLB at 325°F, 55 psig, 100 percent humidity.

These cables have a qualified lifetime of 40 years and are qualified by the above for all HELB areas. Because of the co-servatism of these tests including the severity of the mandrel bend and dielectric test in water after the combined LOCA/SLB profile, engineering analysis concludes that there is sufficient margin to give reasonable assurance of continued operation for more than a year in the post design basis event environment.



Page 5a

The Leavie has primited a test regard 547647 applicable 45 7VA Calle princh: - sandopes the required accordent profiles
TEST ITEM AND TEST EQUIPMENT DESCRIPTION
Four (4) each of two (2) different types of Cable Splice Assemblies were tested during this test program. Both types were fabricated by TVA personnel and are to be used inside containment at Browns Ferry Nuclear Generating Station, Unit 3. The two types of Cable Splice Assemblies are described as follows: The 480 VAC Cable Splice Assembly consists of four (4) single cables of No. 12 Vulkene insulated wire, spliced to four (4) single cables of No. 10 CPJ wire. five (5) of these assemblies were fabricated. Only four (4) were tested. Gree (1) Assembly was a spare. The 250 VDC Cable Splice Assembly consists of a seven (7)-conductor cable, wire size No. 10, with CPJJ insulation, spliced to seven (7)
Laingle conductor caple, wire size No. 10, with CFJJ insulation.

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FRC Task No. ____5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

EQUIPMENT ITEM NO. 89

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

OKONITE, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 89

LICENSEE REFERENCE(S): 1858

FUNCTION (PLANT ID): NOT STATED (EPSJ)
LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-12

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,

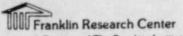
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5£, 5 g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
Y The Licensee (has/has not) provi	ded a response to the SER concerns.
	fically stated that the equipment is hen exposed to the applicable DBE
The Licensee has presented informoutstanding qualification deficient	
The Licensee (has/bas not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim op-	eration (has/has not) been provided by the item.
Corrective action specified	by the Licensee:
Equipment replacement with Equipment modification	th qualified equipment
Equipment relocation above	ve submergence level
Relocate or shield equip	ment from radiation source
Verify qualification by a	additional (testing/analysis)
Equipment relocation to a	
Qualification testing of Other (equipment in progress
	her information for this equipment item asis for justification for interim
	rovided a schedule for the proposed e for accomplishing the corrective
The Licensee states that the equi	ipment item does not require qualification nvironmental qualification.
	CATION EVALUATION CATEGORY BASED ON REV EW
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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FRC Assignment No. 13
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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM			
		DESIGNATION:	
NRC REC	UIREMENTS	= DEFICIENCY	
Documen	ted Evidence of Qualification Adequate		
Adequat	e Similarity Between Equipment and Test Specimen Establis	hed	
Aging I	egradation Evaluated Adequately		
Qualifi	ed Life or Replacement Schedule Established (If Required)		
Program	Established to Identify Aging Degradation		
Criter	# Regarding Aging Simulation Satisfied (If Required)		
	a Regarding Temperature/Pressure Exposure:		
0	Peak Temperature Adequate		
	Peak Pressure Adequate		
	Duration Adequate		
0	Required Profile Enveloped Adequately		
	Steam Exposure (If Required) Adequate		
	a Regarding Spray Satisfied		
	a Regarding Submergence Satisfied		
	a Regarding Radiation Satisfied		
Criter	a Regarding Test Sequence Satisfied		
	a Regarding Test Failures or Severe Anomalies		
	Any) Satisfied		
	a Regarding Functional Testing Satisfied		
Criter	a Regarding Instrument Accuracy Satisfied		
Test Du	ration Margin (1 hour + Function Time) Satisfied		
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)		
		DESIGNATION:	
NPC OIII	ALIFICATION CATEGORY	X = CATEGORY	
HIC QUI	THE TOTAL CHILDOWN		
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 La	ife	
	or Replacement Schedule Justified		
III.	Equipment Exempt From Qualification		
III.b	Equipme . 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. 89

LICENSEE RESPONSE TO NRC SER

EPSJ

The EPS family of power cables consist of ethylene-propylane rubber or cross-linked polyethylene insulation with a chloro-sulfonated-polyethylene jacket or chlorinated-polyethylene jacket. The following qualification tests apply:

The Okonite Company test report form G-3 dated September 7, 1977, "Qualification of Okoguard Ethylene-Propylene Rubber Insulation for Nuclear Plant Service." (see Appendix 2)

Anaconda qualification as described in Franklin Institute Report F-C4836-3. (See Appendix 2.)

The test programs were based on IEEE 383-1974 and IEEE 323-1974. Aging was per the Arrhenius technique. Gamma radiation was to 2 x 10⁸ rads and combined LOCA and MSLB events. Cables were energized during testing. Cables were tested before and after thermal aging. MSLB/LOCA test environments are shown in Appendix 2.

It is concluded from the above tests and using the Arrhenius technique that these cables qualified for at least 40 years at a continuous operating temperature of 90°C. The above tests demonstrate the MSLB test profile was more severe than the NUREG 0588 Appendix C generic envelope and the cables are qualified for all NELB areas.

Because of the conservatism of these tests including the severity of the mandrel bend and dielectric test in water after the combined LOCA/SLB profile, engineering analysis concludes that there is sufficient margin to give reasonable assurance of continued operation for more than a year in the post design basis event environment.

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Edarbment	described on the SCEW sheet is the same as the Equipment	describe
	ferenced report.	
Report		
0	Title	
	Qualification of Okoguard Ethylene-Propylene Rubber Insulation and Field Splice Materials for Nuclear Plant Service	
	Aging, Radiation and LOCA Testing Okoguard Ethylene- Propylene Rubber Insulated Cables and Field Splice Materials for Nuclear Power Generating Stations	
	- Moisture Resistance - Okoguard Ethylene-Propylene Rubber Insulated Cables	
. 0		
cot	Ward sheet designate the 4 as EPSJ (WNE, 823412-2 &	konte
cor	Wart Sheet designate the 4 as EPSJ (WNE, 823412-2)	konte
cor	Wart Sheet designate the 4 as EPSJ (WNE, 823412-2)	konte
cot	Wart Sheet designate the 4 as EPSJ (WNE, 823412-2)	komte
cot	Wart Sheet designate the 4 as EPSJ (WNE, 823412-2)	konte

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/524

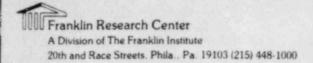
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Requirements for establ	ishing similarity between i	nstalled and tested cables
re contained in the DO	K Guidelines and IEEE 383-7	4 which are reproduced
elow for convenience.		
	- The test specimen should be the same m	
for equipment	identical in design and material constru	ction to the test
specimen. Ar	y deviations should be evaluated as part	of the qualifica-
tion document	ation (see also Section 8.0 below).	
		ZNOC
	IEEE-383 1.3.1 Cable Description. This description or specification should include as a minimum: 1.3.1.1 Conductor — material identification. size, stranding, coating. 1.3.1.2 Insulation — material identification, thickness, method of application. 1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes, extrusions, braids, or others. 1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application. 1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Splice or Connection Description or Both. This description or specification should include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembly. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.	
sho ers. ink. of t lists sen lens test	Type Test Samples. The samples tested aid contain the conductor, insulation, fill-judge, binder tape, overall jacket, shield-and field splices which are representative he cable category being qualified. Table 1 sizes which have been considered repretative of these categories. The sample this should be sufficient to permit reliable readings and evaluation consistent with a testing practice.	

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ELECTRIC CABLES, FIELD SPLI			Std 333-1974
	Table 1 Represensentative Caldes fo	r Type Tests	
Туре	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded multiconductor	temperature and moisture resistance	2.3.1	1/C - 14 or 12 AWG
signal cable (see tist below for individual component) or Single conductor power cable	thermal and radiation exposure	2.3.3	1/C or M/C - 14 or 12 AWC
	design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG 1/C — 6, 4 or 2 AWG
	vertical flame test singles from cable assembly	2.5.6	1/C - 14 or 12 AWG
	vertical tray flame test	2.5.4	7/C - 16, 14 or 12 AWG
Shielded pairs, triple or	temperature and moniture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
signal cable	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
Control	vertical flame test	2.5.6	
Coaxial, triaxial or special instrument cable	resistance . thermal and radiation	2.3.1	. ctua, size
	exposure design basis event	2.4	
	simulation vertical flame test	2.5.6	
	singles from cable		
Single pair therraccouple extension cable	temperature and moisture resistance	2.3.1	2/C - 20 AWG or actual size if smaller
	Germs) and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical frame test singles	2.5.4	
	from cable assembly	2,5.6	
2001-16 000 V power cable 1/C triplexed and multiconductor	vertical tray flame sest	2.5.4	6 AWG (2-5kV) 2/O or 4/O or 4/O (2-15kV)
of the detailed desc	rintion discussed	above it	
licensee to obtain o	ertification from	the manui	facturer identify
t report(s) apply to	the cables furnis	shed for i	nstallation.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

EQUIPMENT ITEM NO. 90

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

MANUFACTURER AND MODEL NOT CITED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 90

LICENSEE REFERENCE(S): 936, 1110, 4767, 1731

FUNCTION (PLANT ID): VARIOUS (PXJ)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-13

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, RFS, None,

Not stated, Not applicable

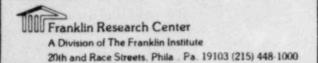
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 5£, 5g, 5h, 5i, 5j
Installed TMI Lessons Searned Implementation	6a, 6b.
Maintenance and Replacement Schedule Summary	7a, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/hes not) specific qualified and/ar will function whe environmental service conditions.	
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not be	ed a correction action for this equipment seen fully established.
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided by the em.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	
Equipment relocation above	
Relocate or shield equipme	
	ditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e	quipment in progress
	er information for this equipment item is for justification for interim
	vided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualification ironmental qualification.
DESIGNATION OF DESIGNANT NEC OUR TETOS	TION PURTHATION CAMPCORY CACES ON PROVIDE
- CIRCLED TEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Q alified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III. Not in Scope
II.b Not Qualified	IV Documentation Not Available



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FRC Assignment No. 13
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		DESIGNATION: X = DEFICIENCY
NRC REC	DUIREMENTS	A - DEFICIENCE
ocumer	nted Evidence of Qualification Adequate	
	te Similarity Between Equipment and Test Specimen Establ Degradation Evaluated Adequately	ished X
ualifi	led Life or Replacement Schedule Established (If Require	d)
rogran	Established to Identify Aging Degradation	
riter	ia Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
0	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	la Regarding Spray Satisfied	
	ia Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied		
	ia Regarding Test Failures or Severe Anomalies	
(If Any) Satisfied		
	ia Regarding Functional Testing Satisfied	
	ia Regarding Instrument Accuracy Satisfied	
rest Du	uration Margin (1 hour + Function Time) Satisfied ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
ricer	a Regarding Margins Sacrated (Mondo 5500, Cat. 1,	
		DESIGNATION
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
.a	Equipment Qualified	
L.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
d.I.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified	Life
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
d.III	Equipment Noc in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

LICENSEE RESPONSE TO NRC SER (Continued)

CHIJ, CPJ, CPJJ, PXJ, PXMJ CABLE

The CP family of cables consists of cross-linked polyethylene insulation and polyvinyl-chloride jacketing, and the PX family of cables consists of cross-linked polyethylene or ethylene propylene rubber, and the jacket is chlorosulfonated-polyethylene or chlorinated-polyethylene. The following LCCA/SLB tests apply:

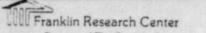
- CP types Wyle Laboratory Test Report 43854-3 dated April 26.
 1978, Qualification Test on eight cable splice Assemblies
 (cable assemblies comprised of CPJ cable).
- FX types*- Franklin Institute Test Report F-C4113 dated May 1975.
 - Rockbestos Company Test Report dated July 1977.
 - Franklin Institute Test Report F-C5120-1 dated January 1980
 - Fre :: 11n Institute Test Report F-C5285-1, deted May 1980
 - Essex Project Report No. PE-53, dated May 7, 1980 and Regard dated June 1979

The test programs were based on IEEE 383-1974 and IEEE 323-1974. Aging was par the Arrhenius technique. Gamma radiation was to 2 x 10 and combined LOCA and MSLB events. Cables were energized during testing. Cables were tested before and after thermal aging. LOCA/MSLB test environments are shown in Appendix 2.

It is concluded from the above tests and using the Arrhenius technique that these cables are qualified for at least 40 years at a continuous operating tamperature of 90°C. The above tests demonstrate the MSLB test profile was more severe than the NUREG 0588 Appendix C generic envelope and the cibies are qualified for all HELB areas.

Because of the conservatism of these tests including the severity of the mind wilder bend and dielectric test in water after the combined LOCA/SLB profile, engineering analysis concludes that there is sufficient margin to give reasonable assurance of continued operation for more than a year in the post design basis event environment.

*Sec appendix 2.



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Jith and Race Streets. Phila. Pa. 19103 (215) 448-1000

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NOTES:	
The licensee has not provided sufficient information to e	establish that the
Equipment described on the SCEW sheet is the same as the	Equipment described
in the referenced reports.	

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	shing similarity between in Guidelines and IEEE 383-74	
elow for convenience.		witch are reproduced
大型型型基本工程等		
	- The test specimen should be the same mo	
	g qualified. The type test should only be identical in design and material construc-	
	deviations should be evaluated as part of	
	tion (see also Section 8.0 below).	
	[0	Zsion
	IEEE-383 1.3.1 Cable Description. This description or -	
	specification should include as a minimum: 1.3.1.1 Conductor — material identi-	
	fication, size, stranding, coating. 1.3.1.2 Insulation — material identi-	
	fication, thickness, method or application.	
	1.3.1.3 Assembly (multiconductor cables - only) - number and arrangement of con-	
	ductors, fillers, binders. 1.3.1.4 Shielding — tapes, extrusions. —	
	braids, or others. 1.3.1.5 Covering — jacket or metallic ar-	
3.4.	mor or both, material identification, thick- ness, method of application.	
	1.3.1.6 Characteristics — voltage and semperature rating (normal and emergency).	
	For instrumentation cables - capacitance. attenuation, characteristic impedance, micro-	
	phonics, insulation resistance, as applicable.	
	1.3.1.7 Identification — manufacturer's trade name, catalog number.	
	1.3.2 Field Splice or Connection Description or Both. This description or specification	
	should include as a minimum: 1.3.2.1 Whether factory or field assem-	
	bled to cable. 1.3.2.2 Conductor connection — type.	
	material identification, and method of assem- bly.	
	1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.	
	Type Test Samples. The samples tested deentain the conductor, insulation, fill-	
ers. ;	neller, binder tane, overall jacket, shield-	
	and field splices which are representative to cable entagory being qualified. Table 1	
lists	sizes which have been considered repre-	
	ative of these caregories. The sample hs should be sufficient to permit reliable	
	readings and evaluation consistent with	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9/

EQUIPMENT ITEM NO. 91

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

VARIOUS MANUFACTURERS, MODEL NOT STATED REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 91

LICENSEE REFERENCE(S): 1858, 936, 1110, 1802

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (XLPE)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-16

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,

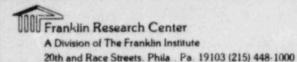
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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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SUMMARY OF LICENSEE RESPONSES TO THE NRC	FER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/has not) provided a	response to the SER concerns.
qualified and will function when exercise environmental service conditions.	
The Licensee has presented information outstanding qualification deficiencies	
The Licensee (has/has not) proposed a item whose qualification has not been	그러나 얼마나 아이들이 아니는 아니는 그는
Justification for interim operation	on (has/has not) been provided by the
Corrective action specified by the	Licensee:
Equipment replacement with qua	alified equipment
Equipment relocation above sub	omergence level
Relocate or shield equipment i	rom radiation source
Verify qualification by additi	onal (testing/analysis)
Equipment relocation to a mild	environment
Qualification testing of equip	
The Licensee has provided other in that can be construed as a basis for operation.	formation for this equipment item or justification for interim
The Licensee (has/has not) provide corrective action. (Schedule for action	
The Licensee states that the equipment and/or should be exempted from environ	
DESIGNATION OF RESULTANT NRC QUALIFICATION	EVALUATION CATEGORY BASED ON DEVIEW
- CIRCLED ITEM ONLY: (See Section 3 of the	
I.a Qualified II	.c Qualified Life Deficiency
	I.a Exempt
	I.b Not in Scope
II.b Not Qualified IV	



IV

Documentation Not Made Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Inst-ument Accuracy Satisfied Test Duration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: X = CATEGORY MRC QUALIFICATION CATEGORY I.a Equipment Qualified Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

LICENSEE RESPONSE TO NRC SER

XLPF

The XLPE family of signal cables consists of flame-retardant, crosslinked polyethylene or flame retardant ethylene-propylene rubber insulation and chlorosulfonated-polyethylene or chlorinated-polyethylene jacket. The following LOCA/SLB tests apply:

The Okonite Company test report form G-3 dated September 7, 1977, "Qualification of Okoguard Ethylene-Propylene Rubber Insulation for Nuclear Plant Service." (see Appendix 2)

Franklin Institute Test Report F-C4039 dated December 1974 (see Appendix 2).

Franklin Institute Test Report F-C4113 dated May 1975 (see Appendix 2).

Rockbestos Company Test Report dated July 1977, amended 1979. (see Appendix 2).

Isomedix (Component Testing Division) test report dated June 1978 for Samuel Moore and Company (see Aspendix 2).

Franklin Institute Test Report F-C4836-3 dated denuary 1978 (see Appendix 2).

Isomedia Test Report 375-02 dated March 1975 for ITT Suprement (see appendix 2)

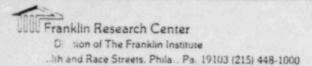
Frank16% institute Test Report F -C3961 dated October 1974 (see Appendix 2)

Boston Insulated Wire and Capie Company Test Report No. 77F019, dated June 14, 1977 (see Appendix 2)

The test programs were based on IEEE 383-1974 and IEEE 323-1974. Aging was per the Arrhenius technique. Gamma radiation was to 2 x 108 rads and combined LOCA and MSLB events. Cables were energized during testing. Cable were tested before and after thermal aging. LOCA/MSLB environments are shown in Appendix 2.

It is concluded from the above tests and using the Arrhenius techniques that these cables are qualified for at least 40 years at a continuous operating temperature of 90°C. The above tests, except for the Franklin Report F-C4039 and the Boston Report 77F019, demonstrate the MSLB test profile was more severe than the NUREG 0588, Appendix C generic envelope. The Frankline Report F-C4039 and the Boston Report 77F019 demonstrate these test profiles were more severe than the operational environmental conditions and will satisfactorily function during the postulated MSLB. Thus it is concluded the cables are qualified for all HELB areas.

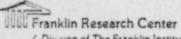
Because of the conservatiam of these tests including the severity of the mandrol bend and dielectric test in water after the combined LOCA/SLB profile, engineering analysis concludes that there is sufficient margin to give reasonable assurance of continued operation for more than a year in the post design basis event environment.



5a

NOTES:
The licensee has not provided sufficient information to establish that the
Equipment described on the SCEW sheet is the same as the Equipment described
in the referenced reports

NOTES: Requirements for establishing similarity between installed and tested cables					
are contained in the DOR (
elow for convenience.					
equipment being for equipment id specimen. Any d	The test specimen should be the same of qualified. The type test should only lentical in design and materia; constructions should be evaluated as part on (see also Section 8.0 below).	be considered valid			
		2800			
f f f f f f f f f f f f f f f f f f f	LEEE-383 1.3.1 Cable Description. This description or pecification should include as a minimum: 1.3.1.1 Conductor — material identification. size, stranding, coating. 1.3.1.2 Insulation — material identification, thickness, method of application. 1.3.1.3 Assembly (multiconductor cables may) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes, extrusions, raids, or others. 1.3.1.5 Covering — jacket or metallic arrange or both, material identification, thickness, method of application. 1.3.1.6 Characteristics — voltage and emperature rating (normal and emergency), for instrumentation cables — capacitance, ttenuation, characteristic impedance, microhenics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's rade name, catalog number. 1.3.2 Field Splice or Connection Description of Both. This description or specification mould include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, laterial identification, and method of assembles. 1.3.2.3 Items from Sections 1.3.1.2 arough 1.3.1.7.				
should ers. jac of the control of th	pe Test Samples. The samples tested contain the conductor, insulation, fill-her, bitteer tape, overall jacket, shield-field spiires which are representative table category being qualified. Table 1 res which have been considered represerve of these categories. The sample a should be sufficient to permit reliable adings and evaluation consistent with sting practice.				



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name into onsuna, right of	LICES, AND CONNECTIONS		Std 393-1974
	Table 1 Represensentative Cables fo	Type Tests	
Туре	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded studies and conductor	temperature and moisture resistance	2.3.1	1/C - 14 or 12 AWG
signal cable (see list below for individual component) or	thermal and radiation	2.3.3	1/C or M/C - 14 or 12 AWG
Single conductor power cable	design basis event	2.4	1/C or M/C - 14 or 12 AWG 1/C - 6, 4 or 2 AWG
	vertical flame test singles from cable assembly	2.5.6	1/C - 14 or 12 AW3
	vertical tray flame test	2.5.4	7/C - 16, 14 or 12 AWG
Shielded pairs, triple or quad from multiconductor	temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
signal cubic	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
Cooxial, triaxial or	vertical flame test temperature and moisture	2.5.6	actua, size
special instrument cable	resistance - thermal and radiation	2.3.3	
	exposure design basis event simulation	2.4	
	vertical flame test singles from caule assembly	2,5.6	
Single pair thermocrouple extension cable	temperature and moisture resistance	2.3.1	2/C = 20 AWG or actual size if smaller
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical tray flame test	2.5.4	
	from cable assembly	2.5.6	
2001-15 000 V power cable 1/C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2.5kV) 2/O or 4/O or 4/O (2-15kV)
u of the detailed de	scription discussed	above it	would be accepta
e licensee to obtain	certification from	the manu	facturer identify
est report(s) apply			
	advice rurills	med TOL	ustallation.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

EQUIPMENT ITEM NO. 92

ELECTRICAL CABLES LOCATED INSIDE AND OUTSIDE CONTAINMENT

VARIOUS MANUFACTURERS, MODEL TEFZEL REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 92

LICENSEE REFERENCE(S): 4770

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (SPECIAL CABLE)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-17

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	la
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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SUMMARY OF LICENSEE RESPONSES TO THE NE	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provided	d a response to the SER concerns.
The Licensee (has/has not) specific	
qualified and ar will function when	n exposed to the applicable DBE
environmental service conditions.	
The Licensee has presented informat	tion which shows there are no
outstanding qualification deficience	
The Licensee (has/has not) proposed item whose qualification has not be	d a corrective action for this equipment een fully established.
Justification for interim oper	ation (has/has not) been provided by the
Licensee for this equipment ite	
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipmen	
Verify qualification by add	
Equipment relocation to a r	
Qualification testing of ed	
Other ()
Mha Tigaraan bas provided athe	- (-6 6 bbl 1b
	r information for this equipment item is for justification for interim
operation.	is for justification for interim
	vided a schedule for the proposed
corrective action. (Schedule action	for accomplishing the corrective
acción	• ,
The Licensee states that the equip	ment item does not require qualification
and/or should be exempted from envi	ironmental qualification.
DESIGNATION OF DESIGNANT NDC OUR TETCA	TION PURITISMION CAMPCODY BACED ON DRUTTEN
- CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON REVIEW f this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
T.b Modification	III.a Exempt
MI.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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Page 2

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
		SIGNATION:
RC REQU	IREMENTS X =	DEFICIENCY
ocument	ed Evidence of Qualification Adequate	d ×
dequate	Similarity Between Equipment and Test Specimen Establishe	-X
ging De	gradation Evaluated Adequately	-
	d Life or Replacement Schedule Established (If Required)	
rogram	Established to Identify Aging Degradation	
riteria	Regarding Aging Simulation Satisfied (If Required)	
	Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	-
	Ouration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	Regarding Spray Satisfied	
	Regarding Submergence Satisfied	
	Regarding Radiation Satisfied	
riteri	Regarding Test Sequence Satisfied Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
	a Regarding Functional Testing Satisfied	
	a Regarding Instrument Accuracy Satisfied	
Post Du	ration Margin (1 hour + Function Time) Satisfied	
rest bu	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
riceri	Regarding Maryins Sacratred (Months 5350) Carrier	
		DESIGNATION:
IRC OUA	LIFICATION CATEGORY	X = CATEGORY
IRC QUA	LIFICATION CATEGORY	X = CATEGORY
. a	Equipment Qualified	X = CATEGORY
. a	Equipment Qualified Equipment Qualification Pending Modification	_
.a	Equipment Qualified	X = CATEGORY
.a I.b	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified	<u></u>
.a I.b II.a	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life	<u></u>
.a I.b II.a	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified	<u></u>
i.a i.b ii.a ii.b	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified Equipment Exempt From Qualification	<u></u>
NRC QUA	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	<u></u>

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

LICENSEE RESPONSE TO NRC SER

Special ETFE/ETFE and ETFE/PVC Cable

The ETFE family of cables consist of extruded ETFE fluoropolymer (TEFZEL) for the insulation and coaxial jacket material with an overall jacket material of either extruded ETFE fluoropolymer (TEFZEL) or poly-vinyl chloride (DVC). The following qualification tests apply:

The Okonite Company test report No. K-O-1 dated September 1, 1979, "Qualification of OKOZEL Insulated Mire and Cable for Nuclear Plant Service." (See Appendix 2.)

The Okonite Company "Engineering Report No. 344, Rev 1, Main Steam Line Break Qualification Test on OKOZEL Insulation," dated April 16, 1981. (See Appendix 2.)

All of the ETTE fluoropolymer (TEFZEL) used by Okonite, Anaconda, Carolina, Telciyne, and Times to manufacture their respective cable was produced by the E. I. DuPont Company. Thus the Okonite qualification tests would be generically applicable to all five of the bove manufacturer's ETFE insulated cables.

The test programs were based on IEEE 383-1974 and IEEE 323-1974. Aging was per the Archenius technique. Gamma radiation was to 2 x 10° rads and combined LOCA and MSLB events. Cables were energized during testing. Cables were tested before and after thermal aging. MSLB/LOCA test environments are shown in Appendix 2. Chemical spray was included.

It is concluded from the above tests and using the Arrhenius technique that these cables qualified for at least 40 years at a continuous operating temperature of 90°C. The above tests demonstrate that the MSLB test profile was more severe than Figure 3.2-21 (High Energy Line Break Outside Conscionent) and that the cables are qualified for all HELB areas.

Because of the conservatism of these tests including the severity of the mandrel bend and dielectric test in water after the combined LOCA/SLB profile, engineering analysis concludes that there is sufficient margin to give reasonable assurance of continued operation for more than a year in the post design basis event environment.

		TABLE 3	. 11-8A SOMP CLASS	IE EQUIP	MENT ELECTRICAL CABLES OUTSIDE CONTAINME	INT SUBJEC	T 10 HEL	8	R3 '	Sheet No. 17
oc	COMPONENT	FUNCTION	CONTRACT NO.	ADM. DA		OPER AT REOMT	UPER	ACCUR REQUIT	ACCUR DEMO	QUAL RPT METHOD
	un .	Signal	BSA3A	Sec sect	Tem - 4550F Press - 32 pag	1 1 4	40 yr	N/A	N/A	Engineering
			Anaconda Wire	6, 3. f.	Humd - 100% Chem Spray - 3000 ppm Rade - 2x108 boron, pH 9.5-10.5					Analysis and Te
1	VAX.		826505 Carolina							
П			Wire & Cable MBN 825280							
1			Teledine Ther-							
1	une.		84555 Times							
1			Wire & Cable							
1						ļ				
1	Canadal Stand	Cable STEE/STE	E and STEE /BUC ()	VA mark	umber WHK) apolies to sheet 17.	+				
					uctor signal cables, insulation, coaxis	liacket	aterial	and ove	all jaci	et material -
1	Name of Street, Street		ductor signal cal	Berther RANK	fluoropolymer. lation and coasial jocket material - et					

Page 5a

The li	censee has not provided sufficient information to establish that the
Equipm	ent described on the SCEW sheet is the same as the Equipment described
in the	referenced report. As reproduced on page 3a, the licensee states that
beca	nuse the raw material furnished for the installed cables is supplied
by t	the same manufacturer that testing on cables of a different manufacturer
(app	parently not installed in the plant) establishes qualification.
The	Licensee analysis does not conform to the requirements of NUREG 0588,
DOR	Guidelines or IEEE standard 383: and is technically not valid.
Euch	manufacturer uses raw materials to which are added various proprietary
mate	erials used for Flame retardancy, handling and manufacture and has
his	own method of manufacture which is usually proprietary. Because of
the	potential effects of additives and manufacturing processes the requirement
for	Type testing are based on actual cables rather than similarity of
one	or more raw materials.

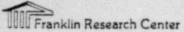
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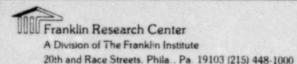
NOTES:		
Requirements for establis	shing similarity between in	nstal ed and tested cabl s
are contained in the DOR	Guidelines and IELE 383-7	which are reproduced
below for convenience.		
2. Test Specimen	The test specimen should be the same m	odel as the
equipment being	qualified. The type test should only	be considered valid
for equipment i	identical in design and material constru	ttion to the test
specimen. Any	deviations should be evaluated as part	of the qualifica-
tion documentat	tion (see also Section 8.0 below).	
		ISOC
	L.3.1 Cable Description. This description or specification should include as a minimum: 1.3.1.1 Conductor — material identification. size, stranding, coating. 1.3.1.2 Insulation — material identification, thickness, method of application. 1.3.1.3 Arsembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes, extrusions, braids, or whers. 1.3.1.5 Covering — jacket or metallic arrange of both, material identification, thickness, method of application. 1.3.1.6 Characteristics — voltage and temperature rating fine mal and emergency). For instrumentation cables — capacitance, as shuation, characteristic impedance, microphonics, insulation resistance, as applicable. 1.3.2.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Splice or Connection Description or Book. This description or specification should include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembly. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.	
should etc.) ing. : of the state	Type Test Samples. The samples tested id contain the conductor, insulation, fill-noiler, binder tape, overall jacket, shield-red field splines which are representative e cable category being admified. Table 1 sizes which have been considered representive of these caregories. The sample his should be sufficient to permit reliable readings and evaluation consistent with testing practics.	



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	THE CREATE, C. ELD ST.	ICES, AND CONNECT, INS		Std 392-1974
		Table 1 Represensentative Cables fo	Type Tests	
	Туре	Test	Section	Size
contr	2000 V multiconductor of cable or ded multiconductor	temperature and moisture resistance	2.3.1	1/C - 14 or 12 AWG
indivi	cable (see its) below for dust component) or	thermal and radiation exposure	2.3.3	1/C or M/C - 14 or 12 AWG
Single	ecoductor power cable	design basis event	2.4	1/C or M/C — 14 or 12 : WG
		vertical flame test singles from cable assembly	2.0.6	1/C - 6, 4 or 2 AWG 1/C - 14 or 12 AWG
-		vertical tray flame test	2.5.4	7/C - 16, 14 or 12 AWC
C426	led pairs, triple or from mosticonductor	temperature and moisture	2.3.1	1 pair shieided 16 AWG or actual cable
signal	caple.	thermal and radiation exposure	2.3.3	
		design basis event simulation vertical flame test	2.4	
Coaxi	al, triaxial or	temperature and moisture	2.5.6	actual size
	I instrument calibe	resistance • thermal and radiation	2.3.3	
7		exposure design basis event	2.4	
		simulation vertical flame test singles from cable assembly	2.5.6	
	per thermocruple ion cable	temperature and moisture resistance	2.3.1	2/C - 20 AWG or secual size if smaller
		thermal and radiation exposure	% 3.3	
		design basis event signulation	2.4	
		vertical tray flaine test vertical flame test singles from cable assembly	2.5.4 2.5.6	
	15 000 V power cable plexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5k½) 2/O or 4/O or 4/O (2-15kV)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

EQUIPMENT ITEM NO. 93

ELECTRICAL PENETRATION LOCATED IN THE CONTAINMENT

WESTINGHOUSE TYPES WX-32198 THROUGH -32212

RECUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 93

LICENSEE REFERENCE(S): 4773, 3207, 719, 749

FUNCTION (PLAST ID): PRESSURE BOUNDARY AND ELECTRICAL CONTINUITY

LICENSEE SUBMITTAL: SCER(S): EEB-PEN-1

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

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

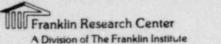
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHETTS:

Contents	Checksheet Page No.
Equipment Icem	la
Summary of Licensee Responses to the MRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3a, 3d
System Consideration Review	4a, 4b, 1a, 4d, 4e, 4£
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

Page !b

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICAL	BLE
X The Licensee (has/has-not) provided a response to the SER concerns.	
The Licensee (has/has not) specifically stated that the equipment is qualified and or will function when exposed to the applicable DBE environmental service conditions.	
The Licensee has presented information which shows there are no outstanding qualification deficiencies.	
The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.	t
Justification for interim operation (has/has nc) been provided by the Licensee for this equipment item.	е
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 considered 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.	n
DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)	<u> </u>
I.a Qualified II.c Qualified Life Deficiency III.a Qualification Not Established III.b Not in Scope IV Documentation Not Available	



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FRC Task No. 574/52 6

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM				
NRC REC	UIREMENTS	DESIGNATION: X = DEFICIENCY			
		~			
Documen	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Establ	ished			
Adequat	egradation Evaluated Adequately	×			
Aging L	ed Life or Replacement Schedule Established (If Require	d) X			
Dragrag	Established to Identify Aging Degradation				
Criteri	a Regarding Aging Simulation Satisfied (If Required)				
Criteri	a Regarding Temperature/Pressure Exposure:				
	Peak Temperature Adequate				
	Peak Pressure Adequate				
	Duration Adequate				
	Required Profile Enveloped Adequately				
0	the state of the s				
Criteri	a Regarding Spray Satisfied	_X_			
Criteri	a Regarding Submergence Satisfied	<u> </u>			
Criteri	Criteria Regarding Radiation Satisfied				
	a Regarding Test Sequence Satisfied				
Criteri	ia Regarding Test Failures or Severe Anomalies				
(If /	Any) Satisfied				
Criteri	a Regarding Functional Testing Satisfied				
Criteri	ia Regarding Instrument Accuracy Satisfied				
Test Du	ration Margin (1 hour + Function Time) Satisfied				
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)				
		DESIGNATION:			
		X = CATEGORY			
NRC QUA	ALIFICATION CATEGORY	V CHIEGOVI			
I.a	Equipment Qualified				
I.b	Equipment Qualification Pending Modification				
II.a	Equipment Qualification Not Established	X			
II.b	Equipment Not Qualified	<u> </u>			
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. 93

LICENSEE RESPONSE TO NRC SER

CER-PLUS-1

App. milez 1. Rev 2

Westinghouse Cannister Penetrations, Table 3.11-4, Short 10

- Qualification was by test on similar penetration: in accordance with IEEE 317-1971, as per FSAR Section 8.3.1.2.
- b. The Lesis performed essentially enveloped the expected maximum emergency environmental conditions inside princry containment including LOCA and ESLB. A single envelope was used.
 - Object of the tests were to maintain commandered integrity by demonstrating a leakage of less than 1 x 10⁻² standard co's of nitrogen per second for all penetrations after 1004 test and to demonstrate electrical operability for Class 12 circuits by demonstrating no voltage breakdown during 18 tests after DLA test.

Tests included seem, pressure, and temperature concurrently in accordance with the following profiles (See Aspendix 2).

- 1. L. V. Power Report PEN-RLK-3-16-01
- 2. M. V. Power Moort PE ACD 4-72-03
- 3. L. V Control and Instr PEM-RLK-3-26-73
- 4. Triax Test report of Incident Testing of Triax Ponetration

The results showed all penetrations still were leak tight after the DBA test (less than 1 x 10° cc/sec leakage).

IR Texts showed all types of conductors used for IE circuits (L.V. power, control, signal, and thermocouple) were still operable after DBA test with the following exception.

The test report of Incident Testing of Triax Penetrations using Amphenol No. 21-529 traixial cable reported a shorting between shields in the cable. Scal integrity (pressure boundary) was maintained but gircuit operability was not. The triax circuits are part of the Neutron Monitoring System and have been designated as Category d. Engineering judgment based on experience with the generic materials indicates that the cable will survive the accident environment for the time required (I hour) to mitigate the accident.

Another. Lest, Franklin Report F-C2709 shows that the generation materials can withstand the chemical spray simultaneous with 5004.

The inhom-1 and of the penetrations are equipped with a red junction comes which completely shield the seals and conductors from both radiation are reduce the games radiation about 25 percent to 7.5 x 10° rads.

Separate LOCA reports for the Class IE type penetration cables about Report 141 for L.V. power and control cable, BIW report 8901 for signal cable (type bostad 7). (See Appendix 3.)

C. Test Sequence - There are no test sequences specified in IEEEE 317-1971.
Engineering judgment based on experience with the generic materials indicates that the electric cable types used (EPR, hypalon) and the epoxy sealants are suitable for 40 years of service and will withstand 108 rads and a 25:00 LOCA or a 3250 MSLB and remain operable.

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; NUREG-0588,	Cat. I; NUREG-0588, Ca	at. II
LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
:		
Elect. Penet.	Electrical Penetration	
animating	Westinghouse	
De Page 1-6	See Note 1 on Page 5f	
NIA	Not Applicable	
a cont. Shell	In Autoclave	
Comertan	Not Stated	
Contained	Not Applicable	
See pla	Not Applicable	
1PEN-RLX-3 1601	! PEN-RLK-3-16-01	:
PEPELE -7267	March 16, 1973	
Westinghour	Westinghouse	
. (1 /		
Not 1	[749]	•
: 512466	Separate Effects Test	X- Note A
test+	!	:
:		:
	: Carry Current	
10/4	Maintain Integrity	
: 1		i
!	Not Stated	
: V		:
	LICENSEE SUBMITTAL E Bot. Penet. What weekers Bee Pays of M/A B. Cont. Shell Contained See p /a PEN-RIK-9 160 PEN-RIK	SUBMITTAL DOCUMENTATION Flact. Pant. Electrical Penetration Westinghouse Re Part See Note 1 on Page 5f W/A Not Applicable A Cont. Skell In Autoclave Contained Not Applicable See pla Not Applicable PER PLK-3 1601 PEN-RLK-3-16-01 PEN ACCEPTATION March 16, 1973 Westinghouse Westinghouse

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
Acceptance Criteria			
(5.2.5/2.2.1/2.2.1)	: Not stated	Not Stated	1
Accuracy (5.2.5/-/-)	NA	Not Applicable	:
Number of Specimens	! !	Prototype representing "B", "C", @ "D" designs	
Test Instruments Calibrated		Yes	!
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)		Active	
Test Duration (5.2.1/-/-)	1	24 hrs	!
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	>24his	Not Applicable	!
Required Function Time	Pot stated	Not Applicable	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	NIA	Leak Test Insulation Resistance LOCA Simulation	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)		Insualtion Resistance Hipot	
1. Representative Sample 2. Baseline Data			
3. Performance Extremes 4. Thermal Aging	:		
5. Radiation Aging	i		
6. Wear Aging	:		
7. Vibration/Seismic 8. DBE Exposure			
9. Post-DBE Exposure			:
10. Inspection	: "		
Aging			i
(5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	Not Dane	Not preaged, no analysis referenced	X Note 2
Material Aging	: /		
Evaluation (7.0/-/-)	!	Contained in [749] & [16 for radiation	!
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		Not Stated	
Radiation Aging, Type		Not Stated	

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
			•
Radiation Aging, Dose (rd)	1.174108	None See Accident Dose	
Radiation Aging, Dose Rate	Not stated		:
Radiation Aging, Method		1 11 11 11 11	:
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)		Material test & Analysis	Note 3
Operational Aging (-/4.2/-)		Not Stated	
Other Age Conditioning (-/4.2/-)	1	Not Reported	
Qualified Life Claimed/ Established (5.2.4/4.19/-)	40 years	Not Stated	X Note 2
Normal Ambient Temperature	. NOTSTATED	Not Applicable	:
Normal Ambient Radiation	!	! Not Applicable	:
Normal Ambient Humidity	:	Not Applicable	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	Program	Not Applicable	!
On-Going Analysis of Failures and Degradation (7.0/-/-)	1	Not Applicable	
Margin (General) (6.0/3.0/3.0)	Not Stated	Not Stated	
Margin (NUREG-0588, Cat. I) (-/3.2/-) 1. Temperature (+15°F) 2. Pressure (+10%, 10 psig max) 3. Radiation		Not Stated	
<pre>(not required) 4. Time (+10%, +1 hour</pre>	V		

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FRC Task No. 5/9/5

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NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	DEFICIENCY (X OR
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/	LOCAMSES	LOCAMSLB	
1.1, 1.2, 1.5/1.1, 1.2, 1.5)			
Radiation Type	Geme	Not Stated	X note 3
Radiation Dose (rd) (4.1.2/1.4/1.4)	7×10 6 1 km	Not Stated	
Radiation Dose Rate (rd/hr)	Not Stated	Not Stated	: "
Radiation Qual. Method (5.3.1/-/-)		Material analysis	. "
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)		Not Stated	"
Equipment Susceptible to Beta Radiation (4.1.2/-/-)		Not Stated	"
Radiation Dose (Normal + Accident) (4.1.2/-/-)	↓	Not Stated	
Plateout Dose Considered (-/1.48/1.48)	yes	Not Stated	"
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	7.5 1107	Not Stated	

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NCTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase	· sec	2.5°F/sec	
Peak: °F/psig/RH/Time	page ity	340/57-60/100/6hrs	
Decrease To: °F/psig/RU/Time		325/43/100/ 3 hrs	
Decrease To: °F/psig/RH/Time		270/38/100/13hrs	
Decrease To: °F/psig/RH/Time		248/22/100/2hrs	
Squipment Surface Tempera- sure (MSLB) (-/1.2.5.C,	NA	only in cannister	
2.2.6/1.2.5.C, 2.2.6)	stored to		1
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	eneligies	Not Performed/reported	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)		Not Stated	
Spray Density (gpm/ft ²)		Not Stated	
Spray Duration		Not Stated	
Submergence Duration (4.1.3/2.2.5/2.2.5)		Not Stated	
In-Leakage Considered (5.2.6, 5.3.2/-/-)		Yes (leak tests performe	ed)
Time to Submergence		Not Applicable	
Dust Environment (-/2.2.11/2.2.11)	: 1	Not Stated	

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FRC Task No. 514/526

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	s follows	: [719]		_							
		ypes of per ith #1 AVG onductors onstantan	tion under t natrations f pigtails re are included	or the present for the s (pair	drunswick p ting the cla te Class C p rs) were inc	which represent lant. There are ss 3 prototype. enetration. Fiv luded to complet	36 can Fifty e coppe	ductor 410 A			
T	he SCEW s	heet des	cribes t	he in	strlled	penetration	as f	0110	vs:		
			CONTRACT NO.	ABYL OR	SOFF CLASS 1E	EQUIPMENT INSIDE CONTAI	NMENT R3	OPER	ACCUR	ACCUR	Sheet Ke
LOC	COMPONENT Cotmt Cannister	FUNCTION Medium Voltag	MFG & MODEL NO.	-			TAT REOMT		REQMT	DEMO	METHOD
	Elec Penetration	- Per and contr	Dilicotinghouse Types WX-32198	- 6-1-f		Press - 55 psig 10 ⁸ rads pm boron ph 8.5	d 1 hr	1 hr	H/A	N/A	PEN-CLX-3-26-
		Chimt for	through WK 3221			Pri ero					PER-RUX-3-16- PIN-6/.D-4-72.
.UL	Seat Shrink	_Intercenn	825348		Tes:0 - 35707	Press - 75 paig	1 92	Tyt	0/4		
-	Splines declare do		i Raychem Type		fixed - 1064 ph 10.5	Spray 3000 pps boron Radi - 2x100 rada tga	val	1 ye	NA	N/A	Rpt F-C 4033-
t	Austrian Boxes	PID Conn Co	N/A	·	Temp - 250°F	Press - N/A	a 1 yr	40 yrs	8VA	N/A	See HOS COD-JI
U4	Cables		Sefer to Pable	1-11-W	Rody - 2 x 10 ⁸	Spray = IVA					Appendix I
L	Modular Elec	Low Voltage	75167	See sec	Temp - 340°F	Press - 105 paig	1 yr			-	
	Penetration Assemblies	Rue .	Hodular	6.1.6	Radn 1-105 41 boron - 141 6.5	che Spray 4000 pen	1 1/1	1 yr	N/A	N/A	Restinghouse
									u.		
			THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.								

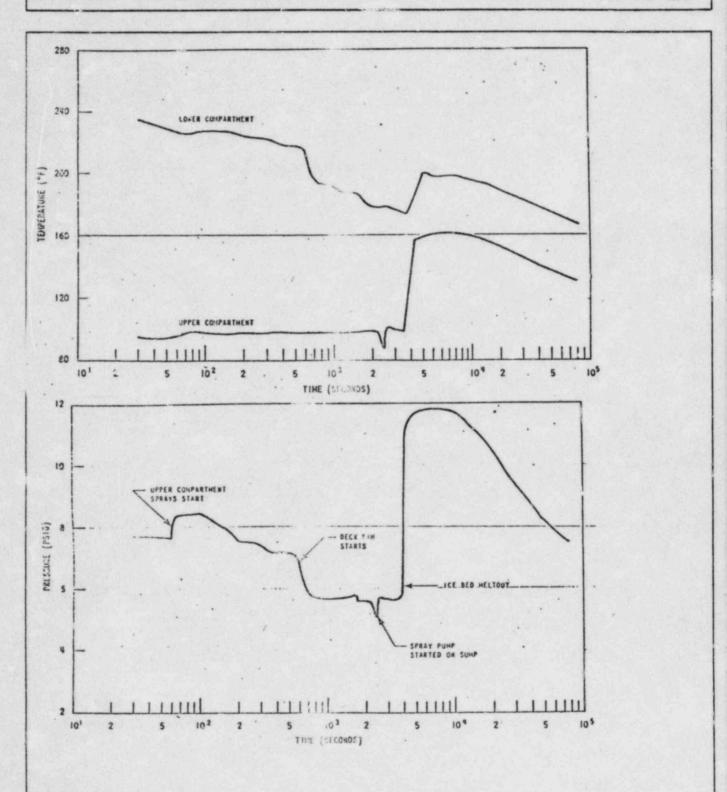
Page 5g

NOTES:
Note 2- The test report and the licensee submittal contain no information
relative to the possibility of aging degradation. It should be noted that the
manufacturer has performed analyses of the materials used in the penetration
assemblies which might be applicable to Sequoyah and be utilized to evaluate
the qualified life of the penetrations. The Licensee should obtain the report
from Westinghouse and perform the evaluations necessary to determine whether
age related degradation is significant under Sequoyah operating conditions
and establish a qualified life estimate.
Note 3- Reference 749 states:
NOTE 3- Reference 749 states:
The series of tests described and evaluated in this regions were
designed to demonstrate that the materials to be wond in the Westinghouse
Penetration assemblies for the Brunswick Station of Caroline Power and
Light Company will meet the requirements of United Engineers and
Constructors specification #9527-01-118-1.
All cables, insulators, connectors, and potting compounds were
tosized, or vendor reports received, to insure that these materials
will meet the steam, pressure, temperature, fire, corrosive outgassing,
and radiation criterions described.
DISCUSSION:
The tasts were divided into five groups:
I. Steam Test
II. Irradiation Effects on Insulation Resistance and Sielectric Strength.
III. Hardness Tasta
Fif. Carrosive Outgassing Tests
V. Flammability Tests
The tests are described and test data reported in each section.
Where complete tests were not run, vendor reports are included to certify
compliance with United Engineers and Constructors Specification No.
9527-01-118-1.

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NOTES:
Note 3 (cont'd)
The referenced report provides extensive testing information on the various
materials used in the penetration designs. However, most of the tests were
performed on specimens which are not representative of the actual configurations
used in the penetrations. No analysis of the differences between the test
samples and the way in which the materials are used in the penetrations. Thus
although the individual materials appeared to have performed satisfactorily in
the test, it it not possible to extrapolate the performance to the installed
pentrations. For Example: Radiation tests on the polyplate were aduated
on the effects on hardness, however there is no correlation provided between
the hardness parameter and the properties required in the penetrations, similarly
irradiation tests on a composite seal assembly were evaluated using dielectric
strength data but no data was provided on the sealing capability if the aaembly.
Note A- The DOR guidelines permit qualification for radiation and chemical
spray by either test or analysis. However, NUREG 0588, and IEEE 317-71 do not.
For electrical penetrations the combination of testing and analysis
must demonstrate leak tight integrity for accident environment and long term
post accident environment as a containment boundary and also must demonstrate
satisfactory electrical performance (power/ control/ instrumentation) during
and after the accident. The combination of separate effects tests on materials
as discussed in note 3 above, the LOCA simulation test discussed on 5a-f and the
analyses of materials contained in page 3a do not address this information.
Therefore it is concluded that documented evidence of qualification has not been provided.

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FRC Task No. __S19/5 LS

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

NOTES:

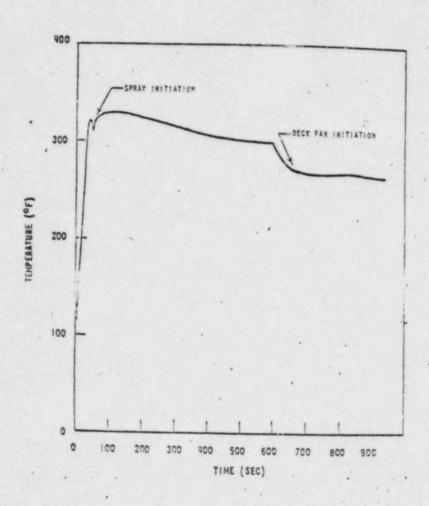


Figure 3.1-3 - Containment Temperature Versus Time for the Most Severe Steam Line Smeak

Page la

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

EQUIPMENT ITEM NO. 94

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

MANUFACTURER AND MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 94

LICENSEE REFERENCE(S): 936, 1110, 4767, 1731

FUNCTION (PLANT ID): VARIOUS (PXNJ)

LICENSEE SUBMITTAL: SCEW(S): LEB-CBL-14

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

R, T, QT, RT 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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3o, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f-
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5 g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b -
Maintenance and Replacement Schedule Summary	7a, 7b, 7c

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Page

SUM	SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED	ITEMS ARE APPLICABLE
x	X The Licensee (has/has not) provided a response to the SE	R concerns.
×	The Licensee (has/nas not) specifically stated that the qualified and/ar will function when exposed to the application environmental service conditions.	equipment is cable DBE
_	The Licensee has presented information which shows there outstanding qualification deficiencies.	are no
-	The Licensee (has/has not) proposed a corrective action item whose qualification has not been fully established.	for this equipment
	Justification for interim operation (has/has not) be Licensee for this equipment item.	en provided by the
	Corrective action specified by the Licensee:	
	Equipment replacement with qualified equipment Equipment modification	
	Equipment relocation above submergence level	
	Relocate or shield equipment from radiation sour	ce
	Verify qualification by additional (testing/anal	
	Equipment relocation to a mild environment	
	Qualification testing of equipment in progress	
	Other ()
	The Licensee has provided other information for this that can be construed as a basis for justification for operation.	
	The Licensee (has/has not) provided a schedule for to corrective action. (Schedule for accomplishing the action	
_	The Licensee states that the equipment item does not requand/or should be exempted from environmental qualifications.	
	PROTECTION OF PROTECTION NEW ARRANGEMENT OF PROTECTION PROTECTION OF PRO	DY DACED ON DEUTEN
- C	DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGO - CIRCLED ITEM. ONLY: (See Section 3 of this TER for Legend)	RI BASED ON REVIEW
	I.a Qualified II.c Qualified Life	Deficiency
	I.a Qualified II.c Qualified Life I.b Modification III.a Exempt	Derrorency
	III.a Qualification Not Established III.b Not in Scope	
		Not Available
11.	II.b Not Qualified IV Documentation	mot available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

EQUIFMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NDC DEC	ALL DEMONTO	X = DEFICIENCY
NRC REC	QUIREMENTS	
Adequat Aging I Qualifi Program Criteri	nted Evidence of Qualification Adequate ce Similarity Between Equipment and Test Specimen Established regradation Evaluated Adequately led Life or Replacement Schedule Established (If Required Established to Identify Aging Degradation la Regarding Aging Simulation Satisfied (If Required) la Regarding Temperature/Pressure Exposure:	NATIONAL PROPERTY.
	Peak Temperature Adequate	
	Peak Pressere Adequate	
	Duration Adequate	-
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	6000 460 B
	a Regarding Spray Satisfied	
	ia Regarding Submergence Satisfied	-
	a Regarding Radiation Satisfied	-
	ia Regarding Test Sequence Satisfied	
Criteri	ia Regarding Test Failures or Severe Anomalies Any) Satisfied	
	a Regarding Functional Testing Satisfied	
	ia Regarding Instrument Accuracy Satisfied	-
Test Du	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	Y = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	1
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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LICENSEE RESPONSE TO NRC SER

CPSJ, CPJ, CPJJ, PXJ, PXMJ CARLE

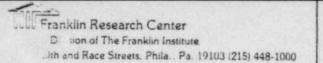
The CP family of cables consists of cross-linked polyethylene insulation and polyvinyl-chloride jacketing, and the PX family of cables consists of cross-linked polyethylene or ethylene propylene rubber, and the jacket is chlorusulfonated-polyethylene or chlorinated-polyethylene. The following LCCA/SLB tests apply:

- C? types Wyle Laboratory Test Report 43854-3 dated April 26, 1978, Qualification Test on eight cable splice Assemblies (cable assemblies comprised of CPJ cable).
- PX types*- Franklin Institute Test Report F-C4113 dated May
 - Lockbestos Company Test Report dated July 1977, amended 1979.
 - Franklin Institute Test Report F-C5120-1 dated January 1980.
 - Frankiss Institute Test Roport F-C5285-1, dated May 1980
 - ESSEX Project Report No. PÉ-53, dated May 7, 1980 and Report dated June 1979

These test programs were based on IEEE-383-1974 and IEEE-323-1974. Aging was per the Arrhenius technique. Gamma radiation was to 2 x 108 rads and combined LOCA and MSLB events. Cables were energized during testing. Cables were tested before and after thermal aging. LOCA/MSLB test environments are shown in Appendix 2.

It is concluded from the above tests and using the Arrhenius technique that these cables are qualified for at least 40 years at a continuous operating temperature of 90°C. The above tests demonstrate the MSLB test profile was more severe than the NUREG 0588, Appendix C, generic envelope and the cables are qualified for all NELB areas.

8-cause of the conservatism of these tests including the severity of the mandrel band and dielectric test in water after the combined LOCA/SLB profile, engineering analysis concludes that there is sufficient margin to give reasonable assurance of continued operation for more than a year in the post design basis event environment.



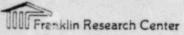
Page 5a

NOTES:
The licensee has not provided sufficient information to establish that the
Equipment described on the SCEW sheet is the same as the Equipment described
for all 1 and 1 an
In the referenced reports.

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FRC Assignment No. 13
FRC Task No. 519/524

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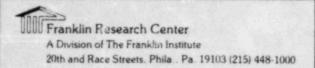
equirements for establ:	ishing similarity between in	nstalled and tested cables
re contained in the DOM	R Guidelines and IEEE 383-7	4 which are reproduced
elow for convenience.		
equipment bei	~ The test specimen should be the same ming qualified. The type test should only identical in design and material constru	pe considered valid
	y deviations should be evaluated as part a ation (see also Section 8.0 below).	or the qualifica-
	[Sori
	IEEE-383 1.3.1 Cable Description. This description or specification should include as a minimum: 1.3.1.1 Conductor — material identification. size, stranding, coating. 1.3.1.2 Insulation — material identification, thickness, method of application. 1.3.1.3 Assembly (multiconductor cobles only) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes, extrusions, braids, or others. 1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application. 1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphenics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Splice — Connection Description or Both. This description or specification should include as a minimum: 1.3.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembly. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.	
sherere. ing. of t lists sen lens test	Type Test Samples. The samples tested aid contain the conductor, insulation, fill-jucker, binder tape, overall jacket, shield-and field splices which are representative the cable category being qualified. Table 1 is sizes which have been considered represtative of these categories. The sample of the sufficient to permit reliable readings and evaluation consistent with it testing practice.	



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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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Table 1 Represensentative Cable Type Test Up to 2003 V multiconductor temperature and multipressure a		
Type Test		
Unite 2002 V multi-send star	Section	Size
control cable or Shielded numbers of temperature and moisture shielded numbers of temperature and moisture resistance.	2.3.1	1/C - 14 or 12 AWG
signal cable (see (ist below for thermal and radiation individual component) or exceptive	2.3.3	1/C or M/C - 14 or 12 AWG
Single conductor power cable design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG
vertical flame test singles from cable assembly	2.5.€	1/C - 6, 4 or 2 AWG 1/C - 14 o. 12 AWG
vertical tray flume test	2,5.4	7/C - 16, 14 or 12 AWC
Shirlded pairs, triple or temperature and moisture resistance resistance resistance		1 pais shielded 16 AWG or actual cable
signas cable thermal and radiation exposure design basis event	2.3.3	
simulation		
Coaxial, triaxial or temperature and moisture	2.5.6	actual size
special instrument cable resistance - thermal and radiation	2.3.3	ectus size
exposure design basis event simulation	2.4	
vertical flame test singles from cable assembly	2.5.6	
Single pair thermocouple temperature and moisture extension cable resistance	2.3.1	2/C - 20 AWG or actual size if smaller
thermal and registion exposure	2.3.3	
dosign basis event simulation	2.4	
vertical frame test vertical flame test singles from cable assembly	2.5.4 2.5.6	
2001-15 000 V power cable vertical tray flame lest 1/C triplexed and multiconductor	2.5.4	6 AWG (2.5kV) 2/O or 4/O c*
1/O implexed and multiconductor		4/O (2-15kV)



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FRC Assignment No. 13
FRC Task No. ____5/9/526

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

EQUIPMENT ITEM NO. 95

ELECTRICAL CABLE LOCATED IN THE ANNULUS

MANUFACTURER AND MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 95

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (PJJ)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-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, MNN, SEN, QI, RPS, None,

Not stated, Not applicable

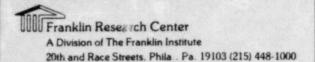
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5€,- 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7c-

RRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 4/1/526

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V	ARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICAB
_	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)
1	The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.
	GNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW RCLED ITEM ONLY: (See Section 3 of this TER for Legend)
	Number 2011
	Qualified II.c Qualified Life Deficiency Modification III.a Exempt
	Qualification Not Established III.b Not in Scope
. a	



III.b

IV

Documentation Not Made Available

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Execumented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Established Aging Degradation Evaluated Adequately Qualified Life of 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 = CATEGORYNRC QUALIFICATION CATEGORY Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified III.a Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review

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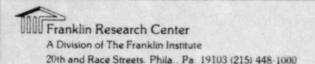
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

LICENSEE RESPONSE TO NRC SER

1. Applicable NCR No. SQNEEB8018.

Class IE electrical cables, which are insulated with either low or high density polyethylene TVA type PJJ and which are located in nodes 2, 5, 10, 17 and the annulus areas, are not suitable for the accident environment profiles.

- A. Cable type PJJ Nodes 2 and 10
 - 1. All type cable PJJ located in these nodes have been evaluated and found not required to mitigate the design basis event for these nodes. Since this cable is not required for the design basis event, replacement of the cables is not required, and the cable is satisfactory for the application.
- 8. Cable type PJJ Modes 5, 17 and the Annulus
 - 1. All type cable PJJ located in these nodes have been evaluated and found to have a maximum full-load current of l amp or less. Engineering analysis confirms that this low current will allow the maximum ambient temperature rise to be 204° F before any cable insulation damage could be experienced. Since the temperature rise and fall is so abrupt for the accident environment profiles identified, the cable will never experience the high temperatures itself (see Appendix 2), replacement of the cables is not required, and the cable is qualified for the accident environments (see Appendix 2).



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

SYSTEM CONSIDERATION REVIEW

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

Reason for Concurrence

- X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

NRC Contract No. NRC-03-79-118
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FRC Assignment No. 13
FRC Task No. ______5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

EQUIPMENT ITEM NO. 96

JUNCTION BOX LOCATED INSIDE AND OUTSIDE CONTAINMENT

TVA, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 96

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PROTECT ELECTRICAL TERMINATION

LICENSEE SUBMITTAL: SCEW(S): EEB-JB-1, 2

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, (M), RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

Page 1b

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provided a response to the SER concerns.
The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
The Licensee has presented information which shows there are no outstanding qualification deficiencies.
The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
Corrective action specified by the Licensee:
Equipment replacement with qualified equipment Equipment modification
Equipment relocation above submergence level Relocate or shield equipment from radiation source
Verify qualification by additional (testing/analysis)
Equipment relocation to a mild environment
Qualification testing of equipment in progress Other ()
The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action)
The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)
I.a Qualified II.c Qualified Life Deficiency I.b Modification III.a Exempt
II.a Qualification Not Established III.b Not in Scope
II.b Not Qualified IV Documentation Not Available

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	RM
		DESIGNATION:
NDC DEC	NIT DEMENING	X = DEFICIENCY
NRC REC	UIREMENTS	A DELICIENTOI
Documen	ted Evidence of Qualification Adequate	
	e Similarity Between Equipment and Test Specimen Establ	ished
	Degradation Evaluated Adequately	
Oualifi	ed Life or Replacement Schedule Established (If Require	ed)
	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
0	Peak Pressure Adequate	
0	Duration Adequate	
0		
0		
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	a Regarding Functional Testing Satisfied	
Criter	ia Regarding Instrument Accuracy Satisfied Iration Margin (1 hour + Function Time) Satisfied	-
Critor	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
CLICEL	ta Regarding Margins Sacretted (Norms 5550) Sacret	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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	w
IV	Documentation Not Made Available	-
	1	/
	The equipment is a container	
	the electrical terminations in	-This.
	11 O. T. I terminaline "	
	The ellarica !	
	the electrical terminations a	a promise
0	The percent of the second	+
	clowhere. The melit buy is not	regueres
	to be qualified	
	In my quarter	

Page 3g

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

LICENSEE RESPONSE TO NRC SER

The junction boxes in the HELB areas are TVA type D boxes which are nonventilated, dusttight, and watertight similar to NEMA boxes except using 12- and 10-gauge steel rather than 14- and 12-gauge steel. They are sealed with neoprene gaskets or RTV silicone in order to restrict moisture entry.

The boxes are not intended to serve as pressure boundaries. A pressure differential will equalize, hence there is no requirement to consider the ability to resist deformation under differential pressure.

The steel of the box construction is not subject to thermal nor radiation aging effects in its service environment. Further, neigher the RH of the normal environment nor the RH of the relatively short HELB environment will produce sufficient corrosion to painted boxes to affect the strength of the boxes. The neoprene gasket and RTV silicone sealing materials are adequate for the service environment temperature and will be replaced after any HELB episode.

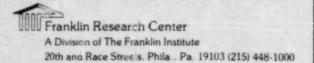
Consequently, engineering analysis concludes that the junction boxes in themselves are not significantly affected by their service environment and are suitable for use for 40 years. The qualification of equipment located on or within these boxes is addressed separately.

*Table	Sheet
3.11-5 3.11-6 3.11-7 3.11-8	4, 5a 16 12 2a, 2d, 3a, 3c, 4a, 5a, 6a, 7a, 9a, 9b

These boxes are not intended to serve as pressure boundaries. A pressure differential will equalize, hence there is no requirement to consider ability to resist deformation under differential pressure.

The steel utilized in box construction is not subject to thermal nor radiation aging effects in the environment of the Sequoyah containment. Further, corrosion is not a factor as the boxes are painted inside and out, and the containment atmosphere is inerted with nitrogen. The LOCA spray of pH 9.0 and the post-LOCA period RH will not be significant to the strength of the boxes. The sealing gasket of neoprene and Dow Corning RTV silicone are useful beyond 1x108 rads.

Consequently, it is our engineering judgment that the junction boxes in themselves are not significantly affected by their service environment and are suitable for 40 years service. The qualification of equipment located in these boxes is addressed separately.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

EQUIPMENT ITEM NO. 97

TERMINAL BLOCK LOCATED INSIDE AND OUTSIDE CONTAINMENT

VARIOUS MANUFACTURERS AND MODELS

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 97

LICENSEE REFERENCE(S): 22, 4028

FUNCTION (PLANT ID): ELECTRICAL TERMINATIONS

LICENSEE SUBMITTAL: SCEW(S): EEB-TB-1

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, (M), RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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	Aa, 4b, 4c, 4d, 4e, 46
Equipment Environmental Qualification Review	5a, 5b, 5c, 9d, 5e, 5f, 5 g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7c

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
The Licensee (has/has not) provide	ded a response to the SER concerns.
	fically stated that the equipment is hen exposed to the applicable DBE
The Licensee has presented informoutstanding qualification deficient	
- The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment	eration (has/Las not) been provided by the item.
Corrective action specified h	by the Licensee:
Equipment replacement with Equipment modification	
Equipment relocation above	ve submergence level
Relocate or shield equipe	ment from radiation source
	additional (testing/analysis)
Equipment relocation to a	
Qualification testing of Other (equipment in progress
	ner information for this equipment item asis for justification for interim
	rovided a schedule for the proposed e for accomplishing the corrective
	ipment item does not require qualification
and/or should be exempted from er	nvironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC	CATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	
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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DESIGNATION:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REO	UIREMENTS	X = DEFICIENCY
Adequate Aging De Qualifie Program Criteria O O O Criteria Test Du	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Estable egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Require Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Required) a Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate a Regarding Spray Satisfied a Regarding Submergence Satisfied a Regarding Radiation Satisfied a Regarding Test Sequence Satisfied a Regarding Test Failures or Severe Anomalies ny) Satisfied a Regarding Functional Testing Satisfied a Regarding Instrument Accuracy Satisfied ration Margin (1 hour + Function Time) Satisfied a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
NRC QUA	LIFICATION 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 or Replacement Schedule Justified	Life
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	
The	Licensee has cited as evidence of qualification technical	al journals,

The Licensee has cited as evidence of qualification technical journals, product bulletins and test summaries. The documents referenced do not provide evidence of qualification by test as required by NUREG 0588. It should be noted that there has been testing conducted on the terminal blocks identified by the licensee. The licensee should contact the manufacturers to obtain the testing reports.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

LICENSEE RESPONSE TO NRC SER

The terminal blocks are of the following types: General Electric Company types EB-5, EB-25, and CR-151B; Westinghouse Style No. 80520 Series; and Cutler-Hammer type 10987. They are comprised of single piece molded, phenolic material with washer head binding screws for circuit wire connections and rated for 30 amperes and 600 volts (7500-volt breakdown voltage). All terminal blocks are mounted in sealed NEMA 4 or TVA type D enclosures that provide additional isolation from submergence, humidity, and other adverse conditions of the surrounding environment. The following qualification tests apply:

- Letter General Electric Company to H. J. Green of TVA dated January 31, 1978, "Test Data for Terminal Blocks, Catalog No. CR-151B."
- Letter Westinghouse Company to . W. Chandler of TVA dated March 9, 1978, "Data for Terminal Block -Westinghouse Style No. 80530."
- Report BWR Owner's Group Report 081-A-01 dated September 23, 1980, supplied test data for terminal block, General Electric Company Type No. EB-25.
- Report Oak Ridge National Laboratory dated 1971, "The Use of Plastics and Elastomers in Nuclear Radiation," by W. W. Parkinson and O. Sisman.

The above test information includes aging, radiation, and LUCA temperature and pressure tests. The results are sufficient in our judgment to warrant confidence that the GE type EB-5, Cutler-Hammer type 10987, and Westinghouse style No. 80520 series terminal blocks, made of the same material (cellulose phenolic) as the tested types GE EB-25 and CR-151B, will perform as well for 40 years, and are satisfactory for continued service in all areas since they are located similarly in protective boxes. In addition, samples of these terminal blocks have been included in connection with additional cable HELB tests to be performed at Wyle Laboratories in Huntsville, Alabama. Test results are expected to be available in January 1982.

*Table			Sheet			
3.11-4 3.11-5 3.11-6 3.11-7 3.11-8	21a 4 16 12 2a, 2	2d, 3a,	4a, 5a,	6a,	7a.	9a

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 98

EQUIPMENT ITEM NO. 98

TRANSFORMER LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE MODEL LIQUID FILLED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 98

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): BACKUP PRESSURIZER HEATER POWER SUPPLY

LICENSEE SUBMITTAL: SCEW(S): EEB-002

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 TMI item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
The Licensee (has/has not) provid	ded a response to the SER concerns.
	fically stated that the equipment is nen exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment in	eration (has/has-not) been provided by the item.
X Corrective action specified b	by the Licensee:
Equipment replacement wit	th qualified equipment
Equipment relocation above	
Relocate or shield equipm	
Verify qualification by a Equipment relocation to a	
Qualification testing of	
	istiquation Somme talen
	ner information for this equipment item asis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
	pment item does not require qualification
and/or should be exempted from en	vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC	CATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available
TI'D HOC MUSTIFIED	TV LOCUMENTATION NOT AVAILABLE

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FRC Project No. C5257
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FRC Task No. 5/9/525

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 98

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQ	UIREMENTS	DESIGNATION: X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Establ	ished $\stackrel{\bigstar}{=}$
		Iblied
Aging L	Degradation Evaluated Adequately	4)
	ed Life or Replacement Schedule Established (If Require	
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	100 personal lines
	a Regarding Spray Satisfied	
	la Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteri	la Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	la Regarding Instrument Accuracy Satisfied	
Test D	wration Margin (1 hour + Function Time) Satisfied	
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NPC OU	ALIFICATION CATEGORY	X = CATEGORY
MAC QUA	abilitation chibdoni	
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. 98

LICENSEE RESPONSE TO NRC SER

- Pressurized Heater Backup Group Transformers 6900V Delta to 480V Delta, 500kVA (1A-A, 1B-B, 2A-A, 2B-B)
 - a. These transformers provide power for the backup pressurized heaters.
 - b. The transformers are located in the Auxiliary Building (General Spaces).
 - c. The transformers were purchased from Westinghouse Electric Corporation on TVA contract 71C2-54523.
- 2. The transformers are required to operate in the following environment:

Temp: 104° F Press: Atm

Hum: 30-80%2(98% peak) Rad: 5 x 10² (40 years) Temp: 115° F

Press: Atm

Hum: 30-80% (100%3peak)
Rad: less than 10

- The transformers are category "a" equipment and must function in the accident environment for the time required for accident mitigation with safety margin to failure.
- 4. This equipment has not been fully qualified for its normal environment (radiation) and consequently nonconformance report SQNEEB8015 has been issued against it. The manufacturer's letter of September 29, 1980 (EEB 801001 008), to F. W. Chandler states that 10 rads presents no problems for this equipment but has not provided test data to support this statement. Our letter of October 17, 1980 (EEB 801015 950), has requested the magufacturer to provide data to prove the equipment in qualified for 10 rad.

The radiation level this equipment will have to operate in $(5 \times 10^2 \text{ normal})$ and 10^3 accident is considered negligible. Therefore, this equipment is satisfactory for continued operation while the proper documentation is being obtained from the manufacturers.

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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 safetyrelated 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 safetyrelated 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.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

EQUIPMENT ITEM NO. 99

SOLENOID VALVE LOCATED IN THE CONTAINMENT

AVCO MODEL C5439

REQUIRED OPERATING TIME: 1 YEAR

TER CHECK SHEET NO. 99

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT AND INSTRUMENT ROOM PURGE VALVES (FSV-30-8,

-10, -50, -52, -15, -17, -40, -56, -20, -58

LICENSEE SUBMITTAL: SCEW(S): MEB-30-003 (3.11-7 PAGE 4)

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

RT, PH CS, A S, (R), M, I, M PPN, EXN, SEN, QT, RPS, None,

Not stated, Not applicable

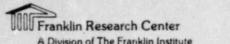
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 0d, 5e , 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	5a, 6b

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

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SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECK	ED ITEMS ARE APPLICABLE
X The Licensee (has/hamma) provided a response to the	SER concerns.
The Licensee (has/her net) specifically stated that to qualified and/or will function when exposed to the ap- environmental service conditions.	
The Licensee has presented information which shows the outstanding qualification deficiencies.	ere are no
The Licensee (has/has not) proposed a corrective activitiem whose qualification has not been fully established	
Justification for interim operation (has/has not) Licensee for this equipment item.	been provided by the
Corrective action specified by the Licensee:	
Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation so Verify qualification by additional (testing/and Equipment relocation to a mild environment Qualification testing of equipment in progress Other (The Licensee has provided other information for the state can be construed as a basis for justification operation. The Licensee (has/has not) provided a schedule for	ource nalysis) s his equipment item n for interim
corrective action. (Schedule for accomplishing the action	
The Licensee states that the equipment item does not and/or should be exempted from environmental qualifications.	
DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CAT- - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legen	AND THE RESIDENCE OF THE PROPERTY OF THE PROPE
I.a Qualified I.b Modification II.a Exempt II.b Not Qualified III.b Not in Scope III.b Not Qualified IV Documentation	



A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	*
Adequate Similarity Between Equipment and Test Spe	cimen Established
Aging Degradation Evaluated Adequately	Cluen ascabilinea
Qualified Life or Replacement Schedule Established	(If Required)
Program Established to Identify Aging Degradation	(If Required)
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	(4)
o Steam Exposure (If Required) Adequate	## ## ## ## ## ## ## ##
Criteria Regarding Spray Satisfied	<u> </u>
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	50 to 10
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomali	
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Sati	efied
Criteria Regarding Margins Satisfied (NUREG-0588,	
Criteria Regarding Margins Satisfied (NOREG-0300,	
	DESIGNATION:
NRC QUALIFICATION CATEGORY	X = CATEGORY
I.a Equipment Qualified	
I.b Equipment Qualification Pending Modificati	OD
II.a Equipment Qualification Not Established	<u>X</u>
II.b Equipment Not Qualified	
II.c Equipment Satisfies All Requirements Excep	Oualified Life
or Replacement Schedule Justified	Addition pric
[[기본(1] 1] 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	ation Peview
	acton vestes
IV Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

LICENSEE RESPONSE TO NRC SER

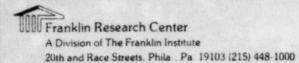
Sheet No. MEB 65-002 Ro Appendix 2 RO

- 10. AVCO Solenoid Valves Model 5439
 - a. The valves are qualified based on SNP-FSAR, paragraph 3.11.2.3.
 - b. The equipment was specified to post-LOCA environments (see attachment 1).
 - c. The valve's function is that of pneumatic pitots for diaphragm actuated isolation valves. The isolation state is the same as the position assumed upon loss of electrical power. The valves will be deenergized before the containment ambient reaches 150° F (the approximate temperature after 10.5 seconds, the time the slowest isolation device must operate).
 - d. The conduit entrance to the coil is sealed as noted in section I.1.g.
 - e. Vendor's data certifies that solenoid valves have been qualified to the following conditions.

240° F at 12 psig at 2.2 by 19⁷ rads first day
180° F at 8 psig at 2.9 by 10 rads first day to 30 days
130° F at 4 psig at 1.04 by 10 rads remainder of first year

An analysis of the vendor's qualification data is being done; however, in our judgment, the Sequoyah operating environment is well within the manufacturers qualified limits and no materials of construction were identified that would conclude a qualified life for less than 40 years.

Refer to NCR SONMEB8007.



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The Licensee states, that this equipment is qualified Decause it was specified for post-LOCA environments. The Licensee has not provided any evidence of qualification for this equipment.
8 8 8

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

EQUIPMENT ITEM NO. 100

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ACVO MODEL C5439

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 100

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PURGE AIR SUPPLY ISOLATION VALVE (FSV-30-2, -5)
LICENSEE SUBMITTAL: SCEW(S): MEB-30-003 (3.11-4 PAGE 1, 3.11-7 PAGE 4)

FUNCTION (PLANT ID): PURGE AIR EXHAUST SUCTION (FSV-30-60, -61)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-003

FUNCTION (PLANT ID): EGTS SUCTION AND DECAY COOLING (FSV-65-7, -8, -28A,

-28B, -47A, -47B, -50, -51)

LICENSEE SUBMITTAL: SCEW(S): MEB-65-002

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

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

7a, 7b, 10

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/hannet) provid	ded a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propos item whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided by the tem.
Corrective action specified b	by the Licensee:
Equipment replacement wit	h qualified equipment
Equipment relocation abov	e submergence level
Relocate or shield equipm	ent from radiation source
Verify qualification by a	
Equipment relocation to a	
Qualification testing of Other (equipment in progress
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
	pment item does not require qualification
and/or should be exempted from en	vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
11.a Qualification Not Established	III.b Not in Scope
	IV Documentation Not Available
II.b Not Qualified	IV Documentation Not Available

Documentation Not Made Available

IV

Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM				
	DESIGNATION:			
NRC REQUIREMENTS	X = DEFICIENCY			
Documented Evidence of Qualification Adequate	X			
Adequate Similarity Between Equipment and Tes	t Specimen Established			
Aging Degradation Evaluated Adequately				
Qualified Life or Replacement Schedule Establ	ished (If Required)			
Program Established to Identify Aging Degrada	tion			
Criteria Regarding Aging Simulation Satisfied	(If Required)			
Criteria Regarding Temperature/Pressure Expos	ure:			
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 And	omalies			
(If Any) Satisfied				
Criteria Regarding Functional Testing Satisfic	ed			
Criteria Regarding Instrument Accuracy Satisf				
Test Duration Margin (1 hour + Function Time)				
Criteria Regarding Margins Satisfied (NUREG-0)	588, Cat. I)			
	DESIGNATION:			
NRC QUALIFICATION CATEGORY	X = CATEGORY			
I.a Equipment Qualified				
I.b Equipment Qualification Pending Modif	ication			
II.a Equipment Qualification Not Establish	ed 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 Qua	lification Review			

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

LICENSEE RESPONSE TO NRC SER

Sheet No. MEB 65-002 Ro Appendix 2 RO

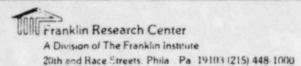
10. AVCO Solenoid Valves - Model 5439

- a. The valves are qualified based on SNP-FSAR, paragraph 3.11.2.3.
- b. The equipment was specified to post-LOCA environments (see attachment 1).
- c. The valve's function is that of pneumatic pitots for diaphragm actuated isolation valves. The isolation state is the same as the position assumed upon loss of electrical power. The valves will be deenergized before the containment ambient reaches 150° % (the approximate temperature after 10.5 seconds, the time the slowest isolation device must operate).
- d. The conduit entrance to the coil is sealed as noted in section I.l.g.
- e. Vendor's data certifies that solenoid valves have been qualified to the following conditions.

240° F at 12 psig at 2.2 by 10⁷ rads first day 180° F at 8 psig at 2.9 by 10 grads first day to 30 days 130° F at 4 psig at 1.04 by 10 rads remainder of first year

An analysis of the vendor's qualification data is being done; however, in our judgment, the Sequoyah operating environment is well within the manufacturers qualified limits and no materials of construction were identified that would conclude a qualified life for less than 40 years.

Refer to NCR SQNMEB8007.



FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

Page 5f

있는 사용하다 보다 보면 보면 되었다. [1] 한 경우 사용하는 사용하는 보다
NOTES:
The Licensee states that this someon
The Licenses states that this equipment is qualified Decause it was specified for sport-LOCA environments. The Licenses has not provided any evidence of qualification for this equipment.
as qualified Decause it was specified
, 6 , 5
for post-LOCA environmente. The Lucensee
0 1 1 0
has not provided any evidence of
0 00 +:- 0 - +0:
quatrication for this agreemen.
0 0 .
그 이 그들이 있는 그리다는 이 있는 것 같아 하는 것이 그렇게 되었다. 생기에 있는 것이 없는데 없었다.
이 사용하다 경험 이 이 사람들이 가득하다 하고 모습니다. 이 동네스 내가 되었다고 모습니다 하는 것이다.

TECHNICAL EVALUATION REPORT

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

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT UNIT 2

VOL. 2 OF 2

NRC DOCKET NO. 50-328

NHCTACNO. 50328

NRC CONTRACT NO. NRC-93-79-118

FRC PROJECT C5257

FRC ASSIGNMENT 13

FRCTASK 526

Prepared by

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

FRC Group Leader: G. J. Toman

Prepared for

Nuclear Regulatory Commission Washington, D.C. 20555

Lead NRC Engineer: P. Shemanski

March 31, 1983

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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)

TENNESSEE VALLEY AUTHORITY
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VOL. 2 OF 2

NRC DOCKET NO. 50-328

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FRC PROJECT C5257

FRC ASSIGNMENT 13

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Reviewed by:

Group Leader

Approved by:

Project Manager

Department Director/

Franklin Research Center

A Division of The Franklin Institute
The Benjamin Franklin Parkway, Phila Pa 19103 (215) 448-1000

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 101

EQUIPMENT ITEM NO. 101

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 8320A19

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 101

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): DAMPER ACTUATORS (FSV-30-86, -137, -138, -140, -141,

-160, -161, -166, -167, -271, -272, -275, -276)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-036 (3.11-6 PAGE 8)

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKS EETS:

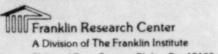
Maintenance and Replacement Schedule Summary

Contents	Check sheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3o, 3d
System Consideration Review	4a, 40, 40, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5a, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

7a, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE NR	C SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/	a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented informat outstanding qualification deficienc	
X The Licensee (has/the) proposed item whose qualification has not be	a corrective action for this equipment en fully established.
X Justification for interim opera Licensee for this equipment ite	tion (has/ been provided by the m.
X Corrective action specified by	the Licensee:
Equipment replacement with	qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipmen	
Verify qualification by add	
Equipment relocation to a m	ild environment
Qualification testing of eq Other (uipment in progress
The Licensee has provided other that can be construed as a basis operation.	information for this equipment item s for justification for interim
X The Licensee (Schedule for action	ided a schedule for the proposed or accomplishing the corrective
The Licensee states that the equipme and/or should be exempted from envis	ent item does not require qualification conmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICAT - CIRCLED ITEM ONLY: (See Section 3 of	
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



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. 519/526

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	EQUIPMENT ENVIRONM	MENTAL QUALIFICATION SUM	MARY FORM
			DESIGNATION:
NRC REQUIREME	NTS		X = DEFICIENCY
Documented Ev	idence of Qualifica	ation Adequate	_X_
		ipment and Test Specimen	
Aging Degrada	tion Evaluated Ade	quately chedule Established (If	Required)
	lished to Identify		
Critoria Roca	rding Aging Simula	tion Satisfied (If Requi	red)
Criteria Reg	rding Temperature/	Pressure Exposure:	
	emperature Adequate		
	ressure Adequate		
	on Adequate		
	ed Profile Envelop	ed Adequately	
	Exposure (If Requi		
Criteria Reg	rding Spray Satisf	ied	
	arding Submergence		
	rding Radiation Sa		
	rding Test Sequenc		
		s or Severe Anomalies	
(If Any) S			
Criteria Reg	rding Functional T	esting Satisfied	
Criteria Reg	arding Instrument A	ccuracy Satisfied	
Test Duratio	Margin (1 hour +	Function Time) Satisfied	
Criteria Reg	irding Margins Sati	sfied (NUREG-0588, Cat.	1)
			DESIGNATION:
NDG OURT TRIC	AMECORY		X = CATEGORY
NRC QUALIFIC	ATION CATEGORY		A - CHILDON
	pment Qualified		
		Pending Modification	X
	pment Qualification		
II.b Equi	pment Not Qualified		
		Requirements Except Qua	alified Life
	eplacement Schedule		
	pment Exempt From Q		- Paul au
		cope of the Qualification	n Review
IV Docu	mentation Not Made	Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 101

LICENSEE RESPONSE TO NRC SER

Sheet MEB 30-036 Appendix 2

ASCO Solenoid Valves - Model 8320A19

These solenoid valves are not qualified for the service intended and will be replaced with qualified valves prior to 100 percent commercial operation.

NRC Contract No. NRC-02-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 102

EQUIPMENT ITEM NO. 102

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL HT8300

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 102

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): GLYCOL RETURN AND SUPPLY ISOLATION VALVE (FSV-61-192,

-194, -122, -97)

LICENSEE SUBMITTAL: SCEW(S): EEB-1063 (3.11-4 PAGE 19)

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

(R) (T) (A) (R) (B) (S) (A) S, (R), (M) I, (M) RPN, EXN, SEN, (QI) RPS, None,

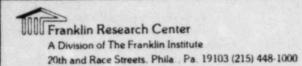
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3e, 3d
System Consideration Review	4a, 4b, 40, 4d, 4e, 4£
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, 7a

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SUMMARY OF LICENSEE RES	SPONSES TO THE N	RC SER - ONLY CHECKED ITE	MS ARE APPLICABLE
X The Licensee (has/	provided	d a response to the SER of	concerns.
	ill function when	cally stated that the equal calculations are calculated as a second control of the calculations are calculated as a second calculated as	
The Licensee has proportion outstanding qualification		tion which shows there ar	e no
		d a corrective action for een fully established.	this equipment
	for interim opera	ation (has/has-hat) been	provided by the
X Corrective acti	ion specified by	the Licensee:	
Equipment of Equipment of Relocate of Verify qual	modification relocation above shield equipment to a market on to a market on to a market or a market o	qualified equipment submergence level nt from radiation source ditional (testing/analysi aild environment quipment in progress	s))
The state of the s		information for this equipments of information for	
		rided a schedule for the for accomplishing the cor	
		ent item does not requir ronmental qualification.	
		TION 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.c Qualified Life De III.a Exempt III.b Not in Scope	ficiency
II.b Not Qualified	o saurroneu	IV Documentation Not	Available



NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519/526

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		DESIGNATION: X = DEFICIENCY
NRC REO	UIREMENTS	A - But I CIDNOI
Adequat Aging D Qualifi Program	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Estab egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Requir Established to Identify Aging Degradation	-
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
(If A	a Regarding Test Failures or Severe Anomalies (ny) Satisfied	
	a Regarding Functional Testing Satisfied	
	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	LIFICATION CATEGORY	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 Satisties All Requirements Except Qualified or Replacement Schedule Justified	l Life
	Equipment Exempt From Qualification	
III.a		
III.a	Equipment Not in the Scope of the Qualification Revie	w

20th and Race Streets. Pa. 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 102-

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB-1063 Appendix No. 3 Revision No. 0 Sheet 1 of 1

The valves are required to operate in the following environment:

Temperature:

327°F

Pressure:

26.4 PSIA

Humidity:

100%

Radiation:

10 year dose + 5.0 x 10⁶ RADS Accident - 1.0 x 10⁸ RADS

The manufacturer's specifications for the valves are as follows:

_Temperature

1760F

Pressure: Humidity:

Atmospheric Not Specified

Humidity: Radiation: Not Specified 4.5 x 10 RADS

The documentation available indicates these valves are unqualified for the environment in which it is located. The valves will be replaced per the resolution of NCR SQNEEB8120.

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____519 15 2.6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10.3

EQUIPMENT ITEM NO. 103

SCLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HT8302B25RF

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 103

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): NOT STATED (FSV-30-129, -130, -106, -107, -122, -123,

-102

LICENSEE SUBMITTAL: SCEW(S): MEB-30-028 (3.11-6 PAGES 9, 17)

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,

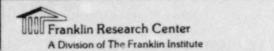
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4e, 4d, 4e, 46
Equipment Environmental Qualification Review	5a, 5b, 5a, 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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/house) provide	ded a response to the SER concerns.
	fically stated that the equipment is nen exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	eration (has/ has not) been provided by the tem.
X Corrective action specified b	by the Licensee:
X Equipment replacement with Equipment modification	h qualified equipment
Equipment relocation abov	re submergence level
Relocate or shield equipm	ment from radiation source
Verify qualification by a	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of Other (equipment in progress
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	Of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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. 519/526

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NRC REO	UIREMENTS	DESIGNATION: X = DEFICIENCY
100		.,
Documen	ted Evidence of Qualification Adequate	_X_
	e Similarity Between Equipment and Test Specimen Establ	ished
Aging D	egradation Evaluated Adequately	-
Qualifi	ed Life or Replacement Schedule Established (If Require	
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	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		
	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified	Life
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. /03

LICENSEE RESPONSE TO NRC SER

HEB 30-028 Appendix II

1. The solenoids are required to operate in the following environment:

Temperature:

1150 F

Pressure:

Atmospheric

Relative Humidity:

100 percent

Radiation:

< 103 rads

The manufacturer states that these valves may be safely used. 2. continuously energized. in the following environment:

Temperature:

1400 F

Pressure:

Atmospheric

Relative Humidity: Not specified (However, NEMA 1 enclosure)

Radiation:

4 x 105 rads

- 3. All environmental specifications are verified by operating experience.
- The Sequoyah operating environment is well within the manufacturer's standard operating conditions.

The above information shows justification for continued use of the valves. However, due to lack of sufficient documentation, TVA will either type-test this valve or replace it with a type-tested valve.

Prepared by: 2.0

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 A Division of The Franklin Institute FRC Assignment No. 13 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 FRC Task No. 519 /526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 105

EQUIPMENT ITEM NO. 104

SOLENOID VALVE LOCATED OUTSIDE CONTAINMENT

ASCO MODEL HT8300

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 104

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM GENERATION HEADER PRESSURE CONTROL VALVE (PSVI-6A,

-6B, -31A, -31B)

LICENSEE SUBMITTAL: SCEW(S): MEB-1-037 (3.11-8 PAGES 3, 4)

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NAC SER - CIRCLED ITEM(S) CALY: (See Section 3 of this TEN for Legend)

(R) T) (T) RT, P, H) CS, (S) 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 la Summary of Licensee Responses to the NRC SER 16 Equipment Environmental Qualification Summary Forms Licensee Response to NRC SER 3a, 3b, 3c, 3d System Consideration Review Equipment Environmental Qualification Review

Installed TMI Lessons Learned Implementation Equipment Summary

Maintenance and Replacement Schedule Summary

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. 519/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/hande) provid	ded a response to the SEF concerns.
The Licensee (has/has not) specification will function when the environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has has) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
X Justification for interim ope Licensee for this equipment i	eration (has/hermet) been provided by the item.
X Corrective action specified b	by the Licensee:
X Equipment replacement wit	th qualified equipment
Equipment relocation abov	ve submergence level
	ment from radiation source
Verify qualification by a	additional (testing/analysis)
Equipment relocation to a	
Qualification testing of Other (equipment in progress
	ner information for this equipment item asis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi	pment item does not require qualification vironmental qualification.
	CATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
T.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

IV

Documentation Not Made Available

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519/526

Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
	DESIGNATION:	
NRC REQUIREMENTS	X = DEFICIENCY	
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Speciment Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Program Established to Identify Aging Degradation	Required)	
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		
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.	1)	
	DESIGNATION: X = CATEGORY	
NRC QUALIFICATION CATEGORY	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 Qua	alified Life	
or Replacement Schedule Justified		
III.a Equipment Exempt From Qualification	- Paristan	
III.b Equipment Not in the Scope of the Qualification	n keview	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 104

LICENSEE RESPONSE TO NRC SER

MEB 1-037 Appendix 2 Rl

1. The solenoids are required to operate in the following environment:

Temperature:

213°F at 15 SEC, 124°F at 30 SEC

Pressure:

Atmospheric

Relative Humidity:

100 Percent

Radiation:

∠ 103rads

2. The manufacturer states that these valves may be safely used, continuously energized, in the following environment:

Temperature:

104°F (However, the manufacturer states that these valves are similar in construction to Asco 202-300-2RF which has been tested to 268°F.)

Pressure:

Atmospheric

Relative Humidity:

Not specified

Radiation:

4 x 105rada

3. All environmental specifications are verified by operating experience.

The above information shows justification for continued use of the valves. However, due to lack of sufficient documentation, TVA will either type-test this valve or replace it with a type-tested valve.

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _519 /526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 105

EQUIPMENT ITEM NO. 105

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HV202300LRV

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 105

LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): (FSV-18-12)

LICENSEE SUBMITTAL: SCEW(S): EEB-1060 (3.11-7 PAGE 1)

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 G CS, A S, (R), M I, QM RPN, EXN, SEN, QI RPS, None,

Contante

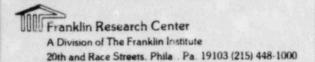
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Concents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3o, 3d
System Consideration Review	407 4b7 4c, 4d, 4c, 46
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

Page 1b

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has-bet) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/ham) propositem whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	ration (has/ been provided by the tem.
X Corrective action specified by	y the Licensee:
Z Equipment replacement with Equipment modification	
Equipment relocation above	
Relocate or shield equipme	
Equipment relocation to a	dditional (testing/analysis)
Qualification testing of	
Other ()
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF RESULTANT NRC QUALIFICATION 3 OF RESULTANT NRC QUALIFICATION 3 OF RESULTANT NRC QUALIFICATION OF RESULTANT NR	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	
II.b Not Qualified	IV Documentation Not Available



NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

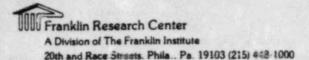
Page 2

DESIGNATION:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 105

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Establ	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Require	
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:
NRC QUALIFICATION CATSGORY	X = CATEGORY
NRC QUALIFICATION CAISSORI	
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	The second second



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 105

LICENSEE RESPONSE TO NRC SER

It has been determined that the component shown on this EQS does not have sufficient documentation. This component has been identified on nonconformance report No. SQNEEB8015. Justification for continued safe operation and the definition of TVA's qualification or replacement plan are found in Appendix 2.

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task №o. ___579 /5 ℃

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 106

EQUIPMENT ITEM NO. 106

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HV-200-924-2F

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 106

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING ISOLATION (FSV-12-79)

LICENSEE SUBMITTAL: SCEW(S): EEB-1039 (3.11-6 PAGE 7)

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,

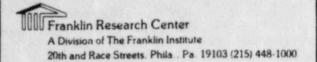
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
Equipment Environmental Qualification Review	5a, 5b, 5e, 5d, 5e, 5£ , 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	€ 87-6b -
Maintenance and Replacement Schedule Summary	7 a, 7b, 7c

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has provide	ed a response to the SER concerns.
The Licensee (has/has not) specification who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/ propose item whose qualification has not it	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment is	ration (has/has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification	n qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipme	
Verify qualification by ac	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e	
Other ()
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from environment	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 106

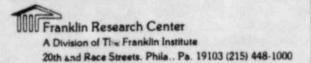
EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Establ Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If 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 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.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qualified or Replacement Schedule Justified	Life
III.a Equipment Exempt From Qualification	

Equipment Not in the Scope of the Qualification Review

Documentation Not Made Available

III.b

IV



NEC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

LICENSEE RESPONSE TO NRC SER

The solenoid valve is required to operate in the following environment:

Temperature:

115°F

Pressure:

Atmospheric

Relative Humidity: 100%

Radiation:

40 year TID - 3.5 x₄10² rads Accident - 1.0 x 10 rads

R1

The manufacturer's specifications for the solenoid valve are as follows:

Temperature:

140°F

Pressure:

Atmospheric

Relative Humidity: NEMA 45enclosure Radiation: 7 x 10 rads

The temperature, pressure and radiation environment in which the valve is located is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace this valve with a qualified replacement.

R1

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519 /576

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 107

EQUIPMENT ITEM NO. 107

SOLENOID VALVE LOCATED IN THE ANNULUS

ASCO MODEL HTX8320

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 107

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT ISOLATION (FSV-90-107, -111, -113, -117)

LICENSEE SUBMITTAL: SCEW(S): EEB-1037 (3.11-5 PAGE 3)

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, (M) RPN, EXN, (I) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

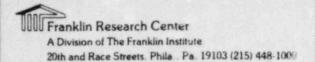
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	ta, 46, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a 7b 7a

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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/ham and) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	ically stated that the equipment is an exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
X The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
	ration (has/\text{\text{has not}}) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from environment	oment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 c	of this TER for Legend)
I.a Qualified D Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt
II.b Not Qualified	III.b Not in Scope IV Documentation Not Available



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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
		DESIGNATION:
NRC REQ	<u>UIREMENTS</u>	= DEFICIENCY
ocumen	ted Evidence of Qualification Adequate	shed X
dequat	e Similarity Between Equipment and Test Specimen Establis	shed
ging D	egradation Evaluated Adequately	-
ualifi	ed Life or Replacement Schedule Established (If Required)	
rogram	Established to Identify Aging Degradation	
criteri	a Regarding Aging Simulation Satisfied (If Required)	
criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
0	Peak Pressure Adequate	
	Duration Adequate	
0	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied Criteria Regarding Test Failures or Severe Anomalies		
Criteria Regarding Functional Testing Satisfied		
	a Regarding Instrument Accuracy Satisfied	
	ration Margin (1 hour + Function Time) Satisfied	
	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
		U GIMBOODU
IRC QUA	ALIFICATION CATEGORY	X = CATEGORY
	Equipment Qualified	
.a	Equipment Qualified Equipment Qualification Pending Modification	X = CATEGORY
i.a I.b	Equipment Qualified	
I.a I.b II.a II.b	Equipment Qualified Equipment Qualification Pending Modification	
i.a I.b II.a	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established	X
i.a I.b II.a	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified	X
I.a I.b II.a	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Li	X
I.a I.b II.a II.b	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Li or Replacement Schedule Justified	X

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 107

LICENSEE RESPONSE TO NRC SER

The solenoid valves are required to operate in the following environment:

Temperature:

150°F

Pressure:

Atmospheric

Relative Humidity: 100%

Radiation:

10 years TID - 5.0 x 10 rads Accident - 5.0 x 10 rads

The manufacturer's specifications for the solenoid valves are as follows:

Temperature:

347°F

Pressure:

Atmospheric

Relative Humidity: NEMA 48
Radiation: 2 x 108 rads

The temperature, pressure and radiation environment in which the valves are located is less severe than the manufacturer's specifications (Reference EEB 810612 035). See generic positions 4.1.8 for relative humidity.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace these valves with a qualified replacement.

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 108

EQUIPMENT ITEM NO. 108

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HT8300

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 108

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM GENERATOR LEVEL (LSV-3-148, -156, -164, -171,

-172, -173)

LICENSEE SUBMITTAL: SCEW(S): EER-1036 (3.11-6 PAGE 7, 3.11-8 PAGES 3, 4,

20, 26)

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, QT RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 4e, 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, 65

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has, provide	ded a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when the environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/harm) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	ration (has/house) been provided by the tem.
X Corrective action specified b	by the Licensee:
X Equipment replacement with Equipment modification	기계 기계 가게 되었습니다.
Equipment relocation abov	ent from radiation source
	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of Other (equipment in progress
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF DESIGNANT NDC OUR TETO	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	THE PROPERTY OF THE PROPERTY O
I.a Qualified	II.c Qualified Life Deficiency
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. 108

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 = CATEGORYNEC QUALIFICATION CATEGORY Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b

Documentation Not Made Available

IV

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 108

LICENSEE RESPONSE TO NRC SER

The solenoid valves are required to operate in the following environment:

Temperature:

307°F (FSV-1-7, 14, 25, 32, 147, 148, 149, 150)

Pressure:

24.4 PSIA

Temperature:

133°F (FSV-3-148, 156, 164, 171, 172, 173, FSV-77-241,

Pressure:

Atmospheric

Relative Humidity:

100%

Radiation:

40 year TID - 1.76 x 103 RADS

Accident - 1 x 104 RADS

The manufacturer's specifications for the solenoid valves are as follows:

Temperature:

176°F

Pressure:

Atmospheric NEMA 4 Epclosure

Relative Humidity: Radiation:

4.5 x 10 RADS

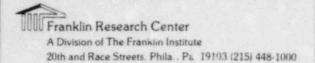
FSV-3-148, 156, 164, 171, 172, 173, FSV-77-241.

The temperature, pressure, and radiation environment in which these solenoid valves are located is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity.

The above information provides adequate justification for continued operation. However due to the lack of qualification documentation, TVA will replace the devices with qualified solenoid valves.

FSV-1-7, 14, 25, 32, 147, 148, 149, 150.

Available documentation indicates that these solenoid valves are not qualified for their pressure and temperature environment. The devices will be replaced with qualified valves or relocated to a less severe environment pending resolution of NCR SONEEB8048.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 109

EQUIPMENT ITEM NO. 109

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL WPX-HV-202-301-1F REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 109

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM GENERATOR LEVEL BYPASS (LSV-3-148A, -156A, -164A,

-171A)

LICENSEE SUBMITTAL: SCEW(S): EEB-1035 (3.11-6 PAGE 8, 3.11-8 PAGE 21)
FUNCTION (PLANT ID): REACTOR BUILDING SUMP DISCHARGE FLOW (FSV-77-128)
LICENSEE SUBMITTAL: SCEW(S): EEB-1035 (3.11-7 PAGE 3, 3.11-8 PAGE 34)

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, M RPN, EXN, SEN, QI RPS, None,

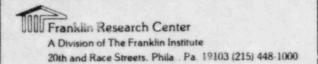
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3o, 3d
System Consideration Review	4a, 4b, 40, 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

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE		
X The Licensee (has/provid	ed a response to the SER concerns.		
The Licensee (has/has not) specification who environmental service conditions.			
The Licensee has presented inform outstanding qualification deficie			
X The Licensee (has/**) propos item whose qualification has not	ed a corrective action for this equipment been fully established.		
Justification for interim ope Licensee for this equipment i	ration (has/has set) been provided by the tem.		
X Corrective action specified b	y the Licensee:		
X Equipment replacement wit Equipment modification			
Equipment relocation above			
	Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis)		
Equipment relocation to a			
Qualification testing of Other (
	er information for this equipment item sis for justification for interim		
	ovided a schedule for the proposed for accomplishing the corrective		
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.		
CONTROL OF THE PROPERTY OF THE	ATION EVALUATION CATEGORY BASED ON REVIEW		
- CIRCLED ITEM ONLY: (See Section 3	or this TER for Legend)		
I.a Qualified	II.c Qualified Life Deficiency		
1.b Modification	III.a Exempt		
II.a Qualification Not Established	III.b Not in Scope		
II.b Not Qualified	IV Documentation Not Available		



NRC QUALIFICATION CATEGORY

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 109

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = CATEGORY

그래요 그리고 있는데	FICIENCY
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)	-

	(1985년 - 1985년	
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. 109

LICENSEE RESPONSE TO NRC SER

1. The solenoid valves are required to operate in the following environment:

Temperature:

202°F (FSV-77-128)

118°F (LSV-3-148A, 156A, 164A, 171A)

Pressure:

Atmospheric

Relative Humidity:

100%

Radiation:

40 year TID - 1 x 10⁵ RADS Accident - 1 x 10⁴ RADS

2. The manufacturer's specifications for the solenoid valves are as follows:

Temperature:

176°F

Pressure:

Atmospheric

Relative Humidity: NEMA 46Enclosure Radiation: 7 x 10 RADS

LSV-3-148A, 156A, 164A, 171A

3. The temperature, pressure, and radiation environment in which these solenoid valves are located, is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity.

The above information provides justification for continued operation. However, due to the lack of qualification documentation these devices will be replaced with qualified solenoid valves.

The pressure and radiation environment in which FSV-77-128 is located is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity. The temperature environment exceeds the manufacturer's specifications. This device will be replaced with a qualified solenoid valve pending resolution of NCR SONEEB8049.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1/0

EQUIPMENT ITEM NO. 110

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HB8300

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 110

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PIPE CHASE AND PENETRATION ROOM COOLER CONTROL VALVES

(FSV-67-338, -344, -346, -348, -350, -352, -342;

FSV-70-85)

LICENSEE SUBMITTAL: SCEW(S): EEB-1029

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

R T RT, P B 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	la
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, 46
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	7 a, 7b, 7a

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
X The Licensee (has/hand) propose item whose qualification has not be	ed a corrective action for this equipment peen fully established.
	ration (has the set) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification	qualified equipment
Equipment relocation above	e submergence level
Relocate or shield equipme	
	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e	equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA	TION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 o	
I.a Qualified	II.c Qualified Life Deficiency
T.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. 110

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMM	ARY FORM	
	DESIGNATION:	
NRC REQUIREMENTS	X = DEFICIENCY	
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If R		
Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Requir		
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:	
NRC QUALIFICATION CATEGORY	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 Qual	ified Life	
or Replacement Schedule Justified		
III.a Equipment Exempt From Qualification		
III.b Equipment Not in the Scope of the Qualification	Review	

Documentation Not Made Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1/0

LICENSEE RESPONSE TO NRC SER

The solenoid valves are required to open the in the following environment:

Temperature:

133°F

R2

Pressure:

Atmospheric

Relative Humidity: Radiation:

100%

10 years TID-8.8 x 10³ rads Accident - 1.0 x 10⁴ rads

R2

The manufacturer's specifications for the solenoid valves are as follows:

Temperature:

140°F

Pressure

Atmospheric

Relative Humidity: NEMA 1 Egglosure Radiation: 4.0 x 10 rads

The temperature, pressure and radiation environment in which the valves are located is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace these valves with a qualified replacement.

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _519 /526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 111

EQUIPMENT ITEM NO. 111

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HB8300

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 111

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PILOT VALVE (FSV-67-168, -170, -176, -182, -184, -186,

-188, -190, -213, -215, -354, -356)

LICENSEE SUBMITTAL: SCEW(S): EEB-1029

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

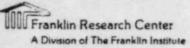
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Licensee Response to NRC SER	3a, 3b, 3c, 3d
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Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

7a, 7b, 70

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE		
X The Licensee (has/	ded a response to the SER concerns.		
	fically stated that the equipment is nen exposed to the applicable DBE		
The Licensee has presented inform outstanding qualification deficie			
X The Licensee (has/ propositem whose qualification has not	sed a corrective action for this equipment been fully established.		
Justification for interim open Licensee for this equipment in	eration (has/has-hat) been provided by the tem.		
X Corrective action specified b	by the Licensee:		
<pre>Equipment replacement wit Equipment modification Equipment relocation above</pre>	re submergence level		
Relocate or shield equipm Verify qualification by a	ent from radiation source		
Equipment relocation to a	Equipment relocation to a mild environment		
Qualification testing of Other (equipment in progress		
	er information for this equipment item sis for justification for interim		
	ovided a schedule for the proposed for accomplishing the corrective		
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.		
DESIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW		
- CIRCLED ITEM ONLY: (See Section 3			
I.a Qualified	II.c Qualified Life Deficiency		
I.b Modification	III.a Exempt		
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available		
	- Dodamentocation not mydradore		

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	<u>M</u>
NRC REG	QUIREMENTS	DESIGNATION: X = DEFICIENCY
	nted Evidence of Qualification Adequate	X
	te Similarity Between Equipment and Test Specimen Establis	shed
Aging I	Degradation Evaluated Adequately	SHOWER .
	ied Life or Replacement Schedule Established (If Required	
Program	Established to Identify Aging Degradation	-
	ia Regarding Aging Simulation Satisfied (If Required)	
	la Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	-
	la Regarding Spray Satisfied	
	ia Regarding Submergence Satisfied	
	ia Regarding Radiation Satisfied ia Regarding Test Sequence Satisfied	
Criter	ia Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
La Company of the Com	ia Regarding Functional Testing Satisfied	
	ia Regarding Instrument Accuracy Satisfied	
Test Di	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
	ia legarding margino outrottee (money over)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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 L	ife
	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	
	FC	



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. 519/526

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LICENSEE RESPONSE TO NRC SER

The solenoid valves are required to operate in the following environment:

Temperature:

133°F

R2

Pressure:

Atmospheric

Relative Humidity:

100%

Radiation:

10 years TID-8.8 x 10³ rads Accident - 1.0 x 10⁴ rads

R2

The manufacturer's specifications for the solenoid valves are as follows:

Temperature:

140°F

Fressure

Atmospheric

Relative Humidity: NEMA 1 Egclosure Radiation: 4.0 x 10 rads

13

The temperature, pressure and radiation environment in which the valves are located is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace these valves with a qualified replacement.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1/2

EQUIPMENT ITEM NO. 112

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HV-200-921-1RF

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 112

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PILOT VALVE (2-FSV-67-184)

LICENSEE SUBMITTAL: SCEW(S): EEB-1029

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

(R) T) (M) 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	la
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, 4a, 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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
The Licensee (has/	ded a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
X Justification for interim open Licensee for this equipment in	eration (has the net) been provided by the item.
X Corrective action specified b	by the Licensee:
Equipment replacement wit	
Equipment relocation above Relocate or shield equipment Verify qualification by a	ment from radiation source additional (testing/analysis)
Equipment relocation to a Qualification testing of Other (
The Licensee has provided oth that can be construed as a ba operation.	mer information for this equipment item asis for justification for interim
X The Licensee (Mas not) procorrective action. (Schedule action)	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
SIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
a Qualified	II.c Qualified Life Deficiency
Modification	III.a Exempt
.a Qualification Not Established	III.b Not in Scope
.b Not Qualified	IV Documentation Not Available

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1/2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC PEQUIREMENTS 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 Recarding 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: # = CATEGORY NRC QUALIFICATION CATEGORY I.a Equipment Qualified Equipment Qualification Pending Modification I.b II.a Equipment Qualification Not Established II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified · III.a Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review III.b Documentation Not Made Available IV

Page 3a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1/2

LICENSEE RESPONSE TO NRC SER

The solenoid valves are required to operate in the following environment:

Temperature:

133°F

R2

Pressure:

Atmospheric

Relative Humidity:

100%

Radiation:

10 years TID-8.8 x 103 rads Accident - 1.0 x 10 rads

R2

The manufacturer's specifications for the solenoid valves are as follows:

Temperature:

140°F

Pressure

Atmospheric

Relative Humidity: NEMA 1 Enclosure

Radiation:

4.0 x 10° rads

The temperature, pressure and radiation environment in which the valves are located is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace these valves with a qualified replacement.

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. _519 /526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1/3

EQUIPMENT ITEM NO. 113

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODELS 8300 AND 8302

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 113

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GAS TREATMENT FAN FLOW CONTROL

(FSV-30-279, 280)

LICENSEE SUBMITTAL: SCEW(S): 3.11-6S8

FUNCTION (PLANT ID): GLYCOL RETURN ISOLATION VALVE (FSV-61-191A, -193A, -96,

-110)

LICENSEE SUBMITTAL: SCEW(S): 3.11-6517

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

RT M 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.
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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, 7th

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/ propositem whose qualification has not	ed a corrective action for this equipment been fully established.
	ration (has has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment replacement with Equipment modification	
Equipment relocation above	
Relocate or shield equipme	
Verify qualification by a	
Equipment relocation to a Qualification testing of	
Other ()
The Licensee has provided other that can be construed as a bar operation.	er information for this equipment item sis for justification for interim
The Licensee (has not) proceeding action (Schedule	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from environment	pment item does not require qualification vironmental qualification.
DESTANZATION OF DESTRUMENT NEG CULTURE	
- CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c. Qualified Life Deficiency
(I.b) Modification	II.c Qualified Life Deficiency 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 SUMMARY FORM	
		DESIGNATION:
NRC REO	UIREMENTS X	= DEFICIENCY
Documen	ted Evidence of Qualification Adequate	X
	e Similarity Between Equipment and Test Specimen Establis	hed
Aging D	egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Required)	
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied		
	ny) Satisfied	
	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
Criteri	a Regarding Margins Sacisfied (North-0300, Cat. 1)	
11110		BEGTON MICH.
		DESIGNATION:
NRC QUA	LIFICATION CATEGORY	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 Li	fe
	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. 113

LICENSEE RESPONSE TO NRC SER

The solenoid valves are required to operate in the following environment:

Temperature:

115°F

Pressure:

Atmospheric

Relative Humidity:

100%

Radiation:

40 years TID = 3.51 x 10² rads Accident ID = 1 x 10⁴ rads

The manufacturer's specifications for the solenoid valves are as follows:

Temperature:

140°F

Pressure:

Atmospheric

Relative Humidity: NEMA 4 Enclosure

Radiation:

Not Specified

The temperature and pressure environment in which the valves are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace these valves with a qualified replacement.

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 114

EQUIPMENT ITEM NO. 114

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 831654 (SOME WITHOUT NAMEPLATE)

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 114

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): REACTOR COOLANT DRAIN TANK NITROGEN SUPPLY (FSV-77-20)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): BORIC ACID BLENDER (FSV-62-143)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): MAKEUP INJECTION VALVE (FSV-62-144)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): CVCS BYPASS FLOW (FSV-62-120); BORIC ACID TRANSFER PUMP

TO BORON INJECTION TANK (FSV-63-38)

LICENSEE SUPMITTAL: SCEW(S): NEB-XX-27

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

(R) (T) (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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3e, 3d
System Consideration Review	4 40, 40, 40, 40, 4E
Equipment Environmental Qualification Review	5a, 5b, 5e, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

Maintenance and Replacement Schedule Summary

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. 519/526

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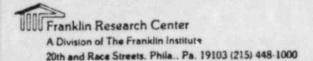
SUMM	ARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X	The Licensee (has/house) provided a response to the SER concerns.
	The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
	The Licensee has presented information which shows there are no outstanding qualification deficiencies.
X	The Licensee (has/person) proposed a corrective action for this equipment item whose qualification has not been fully established.
	X Justification for interim operation (has/her net) been provided by the Licensee for this equipment item.
	X Corrective action specified by the Licensee:
\	Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment 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.
	Y. The Licensee (back/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action)
7	The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.
nesio	SNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW RCLED ITEM ONLY: (See Section 3 of this TER for Legend)
1.0	Qualified II.c Qualified Life Definiency Modification III.a Exempt Qualification Not Established III.b Not in Scope
	Not Qualified IV Documentation Not Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 114

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REC	QUIREMENTS	DESIGNATION: X = DEFICIENCY
	nted Evidence of Qualification Adequate	X
	te Similarity Between Equipment and Test Specimen Establ	ished
Aging I	Degradation Evaluated Adequately	
Qualifi	ied Life or Replacement Schedule Established (If Require	ed)
Program	Established to Identify Aging Degradation	
Criteri	ia Regarding Aging Simulation Satisfied (If Required)	
Criteri	in Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
0	Peak Pressure Adequate	
0	Duration Adequate	
	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
Criter	ia Regarding Spray Satisfied	-
	ia Regarding Submergence Satisfied	-
	ia Regarding Radiation Satisfied	
	ia Regarding Test Sequence Satisfied	
	ia Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	ia Regarding Functional Testing Satisfied	
	ia Regarding Instrument Accuracy Satisfied	
Test D	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
1.2	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. 114

LICENSEE RESPONSE TO NRC SER

Environmental Analysis

It has been determined that the components listed in Appendix I do not have adequate documentation to meet the qualification requirements per NUREG-0588. These components have been identified on NCR's NEB8031 and NEB8141 and will be replaced with qualified components.

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. _519 /526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 115

EQUIPMENT ITEM NO. 115

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 831654

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 115

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): TEST LINE ISOLATION VALVE (FSV-87-9, -10)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): LETDOWN LINE ISOLATION VALVE (FSV-62-77)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): RCS FLOW CONTROL VALVES (FSV-68-305)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): SIS ACCUMULATOR VALVE (FSV-63-23, -64)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): SIS CHECK VALVE (FSV-63-84)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): SIS BORON INJECTION TANK TO CVCS BORIC ACID TANK VALVES

(FSV-63-41, -42)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

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, M RPN, EXN, SEN, QI RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 45
Equipment Environmental Qualification Review	5a, 5b, 5a, 5d, 5c, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

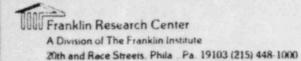
7a, 7b, 7c

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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/	ded a response to the SER concerns.
	fically stated that the equipment is nen exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/ propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Y Justification for interim open Licensee for this equipment in the second control of	eration (has/has ast) been provided by the tem.
X Corrective action specified b	by the Licensee:
Equipment replacement with Equipment modification	h qualified equipment
Equipment relocation abov	
Relocate or shield equipm	
Verify qualification by a Equipment relocation to a	
Qualification testing of Other (
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment item sis for justification for interim
The Licensee (make not) procorrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
ESIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW
CIRCLED ITEM ONLY: (See Section 3	
.a Qualified	II.c Qualified Life Deficiency
.a Qualified .b Modification	III.a Exempt
I.a Qualification Not Established	
I.b Not Qualified	IV Documentation Not Available

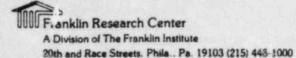


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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 115

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION:

NRC REQ	UIREMENTS	X = DEFICIENCY
Document Adequate Aging D Qualifit Program Criteri Cri	ted Evidence of Qualification Adequate se Similarity Between Equipment and Test Specimen Established and Evaluated Adequately sed Life or Replacement Schedule Established (If Required Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Required) a Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate a Regarding Spray Satisfied a Regarding Radiation Satisfied a Regarding Test Sequence Satisfied a Regarding Test Failures or Severe Anomalies any) Satisfied a Regarding Functional Testing Satisfied a Regarding Instrument Accuracy Satisfied	ished X
Test Du Criteri	uration Margin (1 hour + Function Time) Satisfied ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	_
NRC QUA	ALIFICATION CATEGORY	DESIGNATION: X = CATEGORY
I.a I.b II.a II.b II.c	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified	Life X
· III.a III.b	or Replacement Schedule Justified Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review Documentation Not Made Available	. =



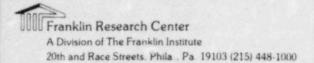
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 115

LICENSEE RESPONSE TO NRC SER

Environmental Analysis

It has been determined that the components listed in Appendix I do not have adequate documentation to meet the qualification requirements per NUREG-0588. These components have been identified on NCR's NEB8031 and NEB8141 and will be replaced with qualified components.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 116

EQUIPMENT ITEM NO. 116

SOLENCID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL LB8300B64RU

REQUIRED OPERATING TIME: CONTINUOUS

TER CHECKSHEET NO. 116

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): BORIC ACID TO BLENDER (FSV-62-140A, B)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

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

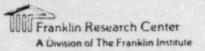
R T M RT, P H CS, A S, (R), M I, M RPN, EXN, SEN, QI RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
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

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE		
X The Licensee (has/	ed a response to the SER concerns.		
The Licensee (has/has not) specification of qualified and/or will function when environmental service conditions.			
The Licensee has presented inform outstanding qualification deficie			
X The Licensee (has/ propositem whose qualification has not	ed a corrective action for this equipment been fully established.		
Z Justification for interim open Licensee for this equipment in	ration (has/there are) been provided by the tem.		
X Corrective action specified b	X Corrective action specified by the Licensee:		
Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment 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.			
	for accomplishing the corrective		
The Licensee states that the equipand/or should be exempted from envi	pment item does not require qualification vironmental qualification.		
DESIGNATION OF RESULTANT NRC QUALIFICATION OF RESULTANT NRC QUALIFICATION 3 CONTROL OF THE PROPERTY OF THE PRO	ATION EVALUATION CATEGORY BASED ON REVIEW 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		
TT-D HOC QUALITIES	IV Documentation Not Available		



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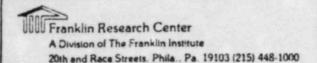
NAC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. _

116

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	RM
		DESIGNATION:
NRC REQ	UIREMENTS	X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	ished X
	e Similarity Between Equipment and Test Specimen Establ	ished
Aging D	egradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (If Require	d)
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
0	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
Criteri	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	-
Criteri	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	The second second
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. 116

LICENSEE RESPONSE TO NRC SER

Environmental Analysis

It has been determined that the components listed in Appendix I do not have adequate documentation to meet the qualification requirements per NUREC-0588. These components have been identified on NCR's NEB8031 and NEB8141 and will be replaced with qualified components.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 117

EQUIPMENT ITEM NO. 117

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HT831654 (NOT STATED UNIT 1)

PEOUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 117

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): TEST LINE ISOLATION VALVE (FSV-87-11)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

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	la
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, 4£
Equipment Environmental Qualification Review	5a, 5b, 5a, 5d, 5e, 5£, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7 a, 7b, 7c

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa 19103 (215) 448-1000 RRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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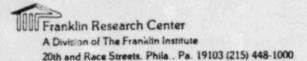
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/	ded a response to the SER concerns.
The Licensee (has/has not) specification will function when the environmental service conditions.	fically stated that the equipment is nen exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/beat) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim operation Licensee for this equipment is	eration (has the and) been provided by the tem.
X Corrective action specified b	by the Licensee:
Equipment replacement wit	
Equipment relocation above Relocate or shield equipment	
Verify qualification by a	dditional (testing/analysis)
Equipment relocation to a Qualification testing of	
Other ()
	er information for this equipment item sis for justification for interim
X The Licensee (nas not) procorrective action. (Schedule action)	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	or this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
Modification II.a Qualification Not Established	III.a Exempt
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available
	Socraticación not avaliable

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. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 117

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evidence of Qualification Adequate Adequata 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 Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification · III.a Equipment Not in the Scope of the Qualification Review III.b IV Documentation Not Made Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 117

LICENSEE RESPONSE TO NRC SER

Environmental Analysis

It has been determined that the components listed in Appendix I do not have adequate documentation to meet the qualification requirements per NUREG-0588. These components have been identified on NCR's NEB8031 and NEB8141 and will be replaced with qualified components.

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 118

EQUIPMENT ITEM NO. 118

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL LB831654

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 118

LICENSEE REFERENCE(S): 1617

FUNCTION (PLANT ID): PRESSURIZER POWER RELIEF VALVE TRAIN A & B (PSV-68-334A,

5, -340AA, AB)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-47

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

RT T RT PH S A, S, (R), M I, M RPN, EXN, SEN, QI RPS, None, Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 5a, 5d, 5a, 5£, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 65

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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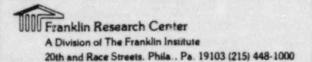
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/ham) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when the environmental service conditions.	[2] [1] [1] [1] [2] [1] [1] [1] [1] [1] [1] [1] [1] [1] [1
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/test) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
Y Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
X Equipment replacement wit Equipment modification	h qualified equipment
Equipment relocation abov	e submergence level
Relocate or shield equipm	ent from radiation source
Verify qualification by a	dditional (testing/analysis)
Equipment relocation to a	mild environment
Qualification testing of Other (equipment in progress
	er information for this equipment item sis for justification for interim
corrective action. (Schedule	ovided a schedule for the proposed for accomplishing the corrective
	pment item does not require qualification
DESIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRC D ITEM ONLY: (See Section 3	
I.a Qualified	II.c Qualified Life Deficiency
1.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. 118

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If B Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Requir 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 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 (I hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. In	Required)
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 Qual or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification IV Documentation Not Made Available	=



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 118

LICENSEE RESPONSE TO NRC SER

Environmental Analysis

It has been determined that the components listed in Appendix I do not have adequate documentation to meet the qualification requirements per NUREG-0588. These components have been identified on NCR NEB8140 and will be replaced with qualified components.

Page 5g

NOTES:
The Licensee has references PGR# (1617)
as evidence of qualification. Reference 1617.
Westinghouse Electric Corp. NS-CE-755
presents a failure modes and effects
analysis for safety related solenois
armagent for the
ralves that concludes:
"-This evaluation of the failure modes of solenoids has shown that the
-solenoid valves are able to perform their function under the adverse
_post accident environmental conditions, and that the potential failure
modes identified do not effect the ability of the solenoid valves to
obtain and maintain a safe position.
10.0 # 40: 50.50
Although this FMEA is suitable
for justification for interim operation, it
Does not substantiate qualification for
the subject equipment.
6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 119

EQUIPMENT ITEM NO. 119

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL LB831654

REQUIRED OPERATING TIME: 10 SECONDS

TER CHECKSHEET NO. 119

LICENSEE REFERENCE(S): 1617

FUNCTION (PLANT ID): LET DOWN ISOLATION (FSV-62-74)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-47

FUNCTION (PLANT ID): RC LOOP 3 LTD FLOW (FSV-62-70)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-47

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, E, 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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Form	ms 2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4o, 4d, 4e, 4f
Equipment Environmental Qualification Review	5 a, 5b, 5c, 5d, 5e, 5£, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7 a: 7b. 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/	ded a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/ propositem whose qualification has not	ed a corrective action for this equipment been fully established.
X Justification for interim ope Licensee for this equipment i	ration (has/her not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with	
Equipment relocation above Relocate or shield equipment	
Verify qualification by ac	
Equipment relocation to a	mild environment
Qualification testing of o	equipment in progress
The Licensee has provided other	er information for this equipment item sis for justification for interim
X The Licensee (Analysis) processing the Corrective action. (Schedule action)	for accomplishing the corrective
The Licensee states that the equip	oment item does not require qualification
and/or should be exempted from env	vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
1.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

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. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 119

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION X = DEFICIEN	
	ification Adequate X	
Documented Evidence of Quali		-
	Equipment and Test Specimen Established	-
Aging Degradation Evaluated	at Cohodula Fatablished (If Required)	_
	nt Schedule Established (If Required)	
Program Established to Ident		_
	mulation Satisfied (If Required)	-
Criteria Regarding Temperatu		
o Peak Temperature Adeq		-
o Peak Pressure Adequat	te	-
o Duration Adequate		-
o Required Profile Enve		-
o Steam Exposure (If Re		-
Criteria Regarding Spray Sat		-
Criteria Regarding Submerger		_
Criteria Regarding Radiation		No. of Street, or other Persons
Criteria Regarding Test Sequ		
Criteria Regarding Test Fail	lures or Severe Anomalies	
(If Any) Satisfied	(1971년대 : 1971년대 1	-
Criteria Regarding Functions		-
Criteria Regarding Instrumer	nt Accuracy Satisfied	
Test Duration Margin (1 hour	r + Function Time) Satisfied	-
Criteria Regarding Margins S	Satisfied (NUREG-0588, Cat. I)	-
	DESIGNATI	ON:
NRC QUALIFICATION CATEGORY	X = CATEG	
NRC QUALIFICATION CATEGORI		
I.a Equipment Qualified	[1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1] : [1]	
	tion Pending Modification	_
II.a Equipment Qualificat	tion Not Established	
II.b Equipment Not Qualis		-
	All Requirements Except Qualified Life	
or Replacement Sched		
· III.a Equipment Exempt Fro		
	e Scope of the Qualification Review	-
IV Documentation Not Ma	ade Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 119

LICENSEE RESPONSE TO NRC SER

Environmental Analysis

It has been determined that the components listed in Appendix I do not have adequate documentation to meet the qualification requirements per NUREG-0588. These components have been identified on NCR NEB8140 and will be replaced with qualified components.

Page 5g

NOTES:
The Licensee has referenced PGR# (1617)
ac evidence of qualification. Reference 1617,
Westinghouse Electric Corp. NS-CE-755
presente a failure moder and effects
analysis for safety related solenois
ralves that concludes:
"This evaluation of the failure modes of solenoids has shown that the
-solenoid valves are able to perform their function under the adverse
_post accident environmental conditions, and that the potential failure
modes identified do not effect the ability of the solenoid valves to
obtain and maintain a safe position."
Although this FMEA is suitable
for justification for interim operation, it
Does not substantiate qualification for
the subject equipment.
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

EQUIPMENT ITEM NO. 120

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HB8300C58RU

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 120

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PIPECHASE & PENETRATION ROOM COOLER CONTROL VALVE

FSV-67-336, -338); NOT STATED (FSV-67-217, -219)

LICENSEE SUBMITTAL: SCEW(S): EEB-1048-2

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

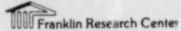
Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6 2, 6b

7a, 7b, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/hes not) provid	ded a response to the SER concerns.
The Licensee (has/has not) specification who environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
Y The Licensee (has/has not) propositem whose qualification has not	ed a corrective action for this equipment been fully established.
_X Justification for interim ope Licensee for this equipment i	eration (has/has bot) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment replacement wit	h qualified equipment
Equipment relocation abov	
	ent from radiation source
	dditional (testing/analysis)
Equipment relocation to a Qualification testing of	
Other (equipment in progress
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment item sis for justification for interim
The Licensee (has not) procorrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NEC QUALTETO	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	
I.a Qualified	II.c Qualified Life Deficiency
1.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



IV

Documentation Not Made Available

A Division of The Franklin Institute 20th and Race Screets. Phila. Pa. 19103 (215) 448-1000 FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Suration Margin (1 hour + Function Time) Satisfied Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) DESIGNATION: X = CATEGORY NRC QUALIFICATION CATEGORY Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified III.a Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review III.D

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

LICENSEE RESPONSE TO NRC SER

It has been determined that the components listed in appendix 1 do not have sufficient documentation. These components have been identified on Nonconformance Report No. SONEEB8101. Justification for continued safe operation and the definition of TVA's qualification or replacement plan are found in appendix 3.

FSV-67-217, 219

The temperature, pressure, and radiation environment in which these solenoid valves are located is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity.

The above information provides justification for continued operation. However, due to the lack of qualification documentation, these devices will be replaced with qualified solenoid valves.

FSV-67-336, 338

The temperature and pressure environment in which these solenoid valves are located is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity. The radiation environment exceeds the manufacturer's specifications. These valves will be replaced before unit 2 initial criticality per ECN L5457.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 121

EQUIPMENT ITEM NO. 121

SOLENOID VALVE LOCATED IN THE LOWER CONTAINMENT

ASCO MODEL HT8300 SERIES/WPXHV2023011 REQUIRED OPERATING TIME: 10 SECONDS

TER CHECKSHEET NO. 121

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM GENERATOR BLOWDOWN (FSV-1-181, -182, -183, -184)

LICENSEE SUBMITTAL: SCEW(S): EEB-1019

FUNCTION (PLANT ID): REACTOR BUILDING SUMP DISCHARGE (FSV-77-127)

LICENSEE SUBMITTAL: SCEW(S): EEB-1019

FUNCTION (PLANT ID): CONTAINMENT BUILDING LOWER COMPARTMENT (FSV-90-108,

-109, -110)

LICENSEE SUBMITTAL: SCEW(S): EEB-1019

FUNCTION (PLANT ID): CONTAINMENT BUILDING UPPER COMPARTMENT (FSV-90-114,

-115, -116)

LICENSEE SUBMITTAL: SCEW(S): EEB-1019

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

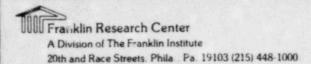
Contents	Checksheet Page No.
Equipment Item	la
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Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

Maintenance and Replacement Schedule Summary

7a, 7b, 7c

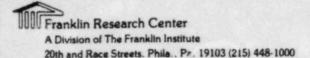
Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/hos.cot) provi	ded a response to the SER concerns.
	fically stated that the equipment is hen exposed to the applicable DBE
The Licensee has presented informoutstanding qualification deficient	
The Licensee (has/her t) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	eration (has/hereat) been provided by the item.
X Corrective action specified	by the Licensee:
	ve submergence level ment from radiation source additional (testing/analysis)
Qualification testing of Other ("type test or	equipment in progress
	ner information for this equipment item asis for justification for interim
	covided a schedule for the proposed of for accomplishing the corrective
The Licensee states that the equi- and/or should be exempted from er	ipment item does not require qualification nvironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	OATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
NRC REQ		ESIGNATION: = DEFICIENCY
Adequat Aging D Qualifi Program Criteri	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Establish egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Required) Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Required) a Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate a Regarding Spray Satisfied a Regarding Radiation Satisfied a Regarding Test Sequence Satisfied a Regarding Test Sequence Satisfied a Regarding Test Failures or Severe Anomalies any) Satisfied a Regarding Functional Testing Satisfied a Regarding Instrument Accuracy Satisfied a Regarding Margins Satisfied (NUREG-0588, Cat. I)	ed X
NRC QUA	LIFICATION CATEGORY	DESIGNATION: X = CATEGORY
I.a I.b II.a II.b II.c	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified List or Replacement Schedule Justified Equipment Exempt From Qualification	X =
III.a III.b IV	Equipment Not in the Scope of the Qualification Review Documentation Not Made Available	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 121

LICENSEE RESPONSE TO NRC SER

The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

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FRC Task No. __519 /526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 122

EQUIPMENT ITEM NO. 122

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 8320

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 122

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): DAMPER ACTUATOR (FSV-65-10)

LICENSEE SUBMITTAL: SCEW(S): MEB-65-023

FUNCTION (PLANT ID): ISOLATION VALVE (FSV-30-3, -6, -60, -69)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-020

FUNCTION (PLANT ID): AUXILIARY BUILDING GAS TREATMENT FAN DAMPERS

(FSV-30-146A, 146B)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-019

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:

Maintenance and Replacement Schedule Summary

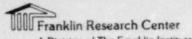
Contents	Checksheet Page No.
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Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

7a, 7b, 7c

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. 519/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficien	
X The Licensee (has/harmat) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided by the tem.
X Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipme	ent from radiation source
	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e	equipment in progress
X Other ("type test or re	.place:
The Licensee has provided other that can be construed as a bas operation.	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equip	oment item does not require qualification
and/or should be exempted from env	
DESIGNATION OF RESULTANT NRC QUALIFICA	TION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 o	
I.a Qualified	II.c Qualified Life Deficiency
1.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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
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FRC Task No. 519/526

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		DESIGNATION:
NRC REQ	UIREMENTS	X = DEFICIENCY
	1 Pride- of Ovelification Magnets	_X_
ocumen	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Establi	
	egradation Evaluated Adequately	
ging D	ed Life or Replacement Schedule Established (If Required	1)
valiti	Established to Identify Aging Degradation	
ritori	a Regarding Aging Simulation Satisfied (If Required)	
riteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	=
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submerg e Satisfied	
	a Regarding Radiat at atisfied	
Criteri	a Regarding Test S ence Satisfied	
Criteri	a Regarding Test F lures or Severe Anomalies	
(If A	ny) Satisfied	
	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	LIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified Equipment Qualification Rending Modification	X
d.l	Equipment Qualification Pending Modification Equipment Qualification Not Established	
II.a		
II.b	Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified	Life
51.0	or Replacement Schedule Justified	
777.2	Fauinment Framh From Qualification	
III.a	Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 122

LICENSEE RESPONSE TO NRC SER

MEB 65-023 RO Appendix 2 RO

1. ASCO Solenoid Valves

- a. The valves are qualified for interim use based on SNP-FSAR, paragraph 3.11.2.3.
- b. Vendor information is not complete or fully documented.
- c. Qualification documentation does not exist for these valves, however, we believe they are qualifiable by material analysis.

If complete qualification cannot be verified, TVA will either type-test this device or replace it with a type-tested device.

Refer to NCR SQNMEB8007.

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. ____519 /52C

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 123

EQUIPMENT ITEM NO. 123

SOLENOID VALVE LOCATED OUTSIDE CONTAINMENT

ASCO MODEL 8300

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 123

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PILOT VALVES (FSV1-7, -14, -25, -32, -147, -150, -148,

-149)

LICENSEE SUBMITTAL: SCEW(S): EEB-1036

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, (M) RPN, EXN, SEN, (QI) RPS, None,

Not stated, Not applicable

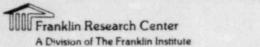
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Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

Maintenance and Replacement Schedule Summary 7a, 7b, 7e

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has the provid	ed a responsa to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/ propositem whose qualification has not	ed a corrective action for this equipment been fully established.
Y Justification for interim ope Licensee for this equipment i	ration (has/house) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment relocation to a Qualification testing of X Other ("replace or re) The Licensee has provided other that can be construed as a base	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519/526

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IRC REQ	UIREMENTS X	DESIGNATION: = DEFICIENCY
ocumen	ted Evidence of Qualification Adequate	_X_
dequat	e Similarity Between Equipment and Test Specimen Establis egradation Evaluated Adequately	hed
malifi	ed Life or Replacement Schedule Established (If Required)	=
	Established to Identify Aging Degradation	
	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	any) Satisfied	
	a Regarding Functional Testing Satisfied	
	a Regarding Instrument Accuracy Satisfied	
Cest Du	ration Margin (1 hour + Function Time) Satisfied	=
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION
IRC QUA	ALIFICATION CATEGORY	X = CATEGOR
.a	Equipment Qualified	
.b	Equipment Qualification Pending Modification	X
I.a	Equipment Qualification Not Established	
I.b	Equipment Not Qualified	=
I.c	Equipment Satisfies All Requirements Except Qualified Li	fe
	or Replacement Schedule Justified	
	Equipment Exempt From Qualification	
III.a		
III.a	Equipment Not in the Scope of the Qualification Review	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 123

LICENSEE RESPONSE TO NRC SER

The solenoid valves are required to operate in the following environment:

Temperature:

307°F (FSV-1-7, 14, 25, 32, 147, 148, 149, 150)

Pressure:

24.4 PSIA

Temperature:

133°F (FSV-3-148, 156, 164, 171, 172, 173, FSV-77-241

Pressure:

Atmospheric

Relative Humidity:

100%

Radiation:

40 year TID - 1.76 x 103 RADS

Accident - 1 x 104 RADS

The manufacturer's specifications for the solenoid valves are as follows:

Temperature:

176°F

Pressure:

Atmospheric

Relative Humidity:

NEMA 4 Enclosure

Radiation:

4.5 x 10 RADS

FSV-3-148, 156, 164, 171, 172, 173, FSV-77-241.

The temperature, pressure, and radiation environment in which these solenoid valves are located is less severe than the manufacturer's specifications. See generic position 4.1.8 for relative humidity.

The above information provides adequate justification for continued operation. However due to the lack of qualification documentation, TVA will replace the devices with qualified solenoid valves.

FSV-1-7, 14, 25, 32, 147, 148, 149, 150.

Available documentation indicates that these solenoid valves are not qualified for their pressure and temperature environment. The devices will be replaced with qualified valves or relocated to a less severe environment pending resolution of NCR SQNEEB8048.

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. ___5191526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

EQUIPMENT ITEM NO. 124

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL 206-381-3RF

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 124

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): REACTOR COOLANT DRAIN TANK TO VENT HEADER (FSV-77-18);

REACTOR COOLANT DRAIN FLOW CONTROL (FSV-77-9)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-46

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,

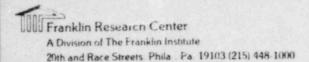
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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	ta, 1b, 4c, 4d, 4e, 4£
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	7 a, 7b, 7s

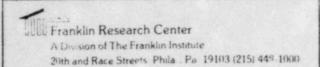
Page

SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABI
X The Licensee (has/her not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specifi qualified and/or will function whe environmental service conditions.	cally stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not b	ed a corrective action for this equipment seen fully established.
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided by the em.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (submergence level ent from radiation source ditional (testing/analysis) mild environment
	r information for this equipment item is for justification for interim
	for accomplishing the corrective
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualification ironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 o	TION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available



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		DESIGNATION:
NRC REQ	UIREMENTS	X = DEFICIENCY
	프로마이 기업을 다고 있다. 그 이 경기 가는 그리 나는 것이 되었다. 그리 나가 있다고 있다.	
Documen	ted Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished
Aging D	41	
Qualifi	d)	
Program	FIRST -	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak, Temperature Adequate	
	Peak Pressure Adequate	
0	Duration Adequate	
0	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
Criteri	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
	my) Satisfied	
Critori	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	LIFICATION CATEGORY	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	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

Checksheets 5a through 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. 125

EQUIPMENT ITEM NO. 125

SOLENOID VALVE LOCATED IN THE ANNULUS

ASCO MODEL 206-381-3RF

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 125

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): RCS FLOW CONTROL VALVE (FSV-68-307)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-46

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	la
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, 5g, 5g, 5h, 51, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	62, 60
Maintenance and Replacement Schedule Summary	7a, 7h, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specification who denvironmental service conditions.	스타일에 [아이프라마니아] [10] [10] [10] [10] [10] [10] [10] [10
X The Licensee has presented information outstanding qualification deficient	ation which shows there are no ncies.
The Licensee (has/has not) propose item whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment is	ration (has/has not) been provided by the tem.
Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ac Equipment relocation to a Qualification testing of o	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION 3 CONTROL OF THE CONTRO	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1615

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b Documentation Not Made Available

See item 124 for evaluation.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 126

EQUIPMENT ITEM NO. 126

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL NP831654E

REQUIRED OPERATING TIME: 10 SECONDS

TER CHECKSHEET NO. 126

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): TEST LINE ISOLATION VALVE (FSV-87-7, -8); LET DOWN

ISOLATION VALVE (FSV-62-72, -73)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-43

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:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3 a, 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, 9 j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7- 7h 70

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	led a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propos item whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided by the tem.
Corrective action specified b	by the Licensee:
	re submergence level ment from radiation source midditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a) Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMA	
	DESIGNATION:
RC REQUIREMENTS	X = DEFICIENCY
ocumented Evidence of Qualification Adequate	
dequate Similarity Between Equipment and Test Specimen E	stablished
ging Degradation Evaluated Adequately	
qualified Life or Replacement Schedule Established (If Re	quired)
Program Established to Identify Aging Degradation	
criteria Regarding Aging Simulation Satisfied (If Require	(d)
riteria 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	
riteria 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	
est Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	
	DESIGNATION:
NRC QUALIFICATION CATEGORY	X = CATEGORY
.a Equipment Qualified	_X_
b Equipment Qualification Pending Modification	
I.a Equipment Qualification Not Established	-
I.b Equipment Not Qualified	
II.c Equipment Satisfies All Requirements Except Quali	fied Life
or Replacement Schedule Justified	
III.a Equipment Exempt From Qualification	-
III.b Equipment Not in the Scope of the Qualification F	Review
IV Documentation Not Made Available	
Documentation Not made Available	
See neview of equipment item no. 12	4 Promonation

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 127

EQUIPMENT ITEM NO. 127

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL 206-381-3RF

REQUIRED OPERATING TIME: 10 SECONDS

TER CHECKSHEET NO. 127

LICENSEE REFERENCE(S): 648

FUNCTION (PLANT ID): REACTOR COOLANT DRAIN TANK TO GAS ANALYSIS (FSV-77-16)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-43

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	la
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 Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/	ded a response to the SER concerns.
	fically stated that the equipment is non-exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment in	eration (has/has not) been provided by the tem.
Corrective action specified b	by the Licensee:
Verify qualification by a Equipment relocation to a Qualification testing of Other (re submergence level ment from radiation source additional (testing/analysis) mild environment equipment in progress er information for this equipment item
The Licensee (has/has not) pr	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	CATION EVALUATION CATEGORY BASED ON REVIEW
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 SUMM	ARY FORM			
	DESIGNATION:			
NRC REQUIREMENTS	X = DEFICIENCY			
THE RESOLUTION				
Ocumented Evidence of Qualification Adequate				
Adequate Similarity Between Equipment and Test Specimen	Established			
Aging Degradation Evaluated Adequately				
Qualified Life or Replacement Schedule Established (If R	equired)			
Program Established to Identify Aging Degradation				
Criteria Regarding Aging Simulation Satisfied (If Requir	ed)			
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:			
NRC QUALIFICATION CATEGORY	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 Qual	lified Life			
or Replacement Schedule Justified				
III.a Equipment Exempt From Qualification				
III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification IV Documentation Not Made Available	Review			

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FRC Project No. C5257
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FRC Task No. __5/9 /526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 128

EQUIPMENT ITEM NO. 128

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 206-381-3RF

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 128

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): DAMPER ACTUATOR (FSV-65-52, -53, -30, -26, -27)

LICENSEE SUBMITTAL: SCEW(S): MEB-65-022
FUNCTION (PLANT ID): NOT STATED (FSV-30-157B)
LICENSEE SUBMITTAL: SCEW(S): MEB-30-021

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	la
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, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5c, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

Maintenance and Replacement Schedule Summary

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/hat Hot) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function whe environmental service conditions.	cally stated that the equipment is en exposed to the applicable DBE
X The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment een fully established.
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided by the em.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme	submergence level ent from radiation source
Equipment relocation to a	ditional (testing/analysis) mild environment
Qualification testing of e	
	er information for this equipment item sis for justification for interim
에게 되었다. 그 사람들은 그 그 그 그 그 그 그 그 그 그 그 그 그 그 그 그 그 그 그	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

Franklin Research Center
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20th and Race Streets, Phila Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 128

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

		DESIGNATION:
NRC REG	QUIREMENTS	X = DEFICIENCY
Ocumer	ated Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished
	Degradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (If Require	d)
	Established to Identify Aging Degradation	
Criter	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	-
0	Peak Pressure Adequate	-
0	Duration Adequate	
0	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
Criteri	a Regarding Spray Satisfied	
Criter	ia Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criter	la Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
(IE)	Any) Satisfied	
	a Regarding Functional Testing Satisfied	
	ia Regarding Instrument Accuracy Satisfied	
	ration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NDC OU	ALIFICATION CATEGORY	X = CATEGORY
NRC QUA	ALIFICATION CATEGORY	A - CHILDOWI
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	
	마하나 하는 그 이번 사람들이 보이 보는 것이 없는 그 모든데 없어 다시하다면서	

See item 124 for evaluation.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 128

LICENSEE RESPONSE TO NRC SER

- a. The valves are qualified by test as described in ASCO test report AQS21678/TR Revision A. Testing conforms to the requirements of IEEE Standard 323-1974.
- b. The test criteria were established prior to test and the simulated environment for the LOCA simulation exceeds the requirements of NUREG-0588, Section 2.2. In liqu of measuring the components surface temperature, soak periods exceeding those required by NUREG-0588 ensure that the component temperature reached the ambient.
- c. The test sequence conforms fully to IEEE 323-1974 and NUREG-0588 section 2.3. The sequence was as follows:
 - 1. Thermal aging 268° F for 12 days
 - 2. Radiation aging 50 megarads
 - 3. Wear aging 40,000 cycles
 - 4. Seismic Simulation and vibration endurance
 - 5. Accident radiation 150 megarads
 - 6. LOCA simulation
- d. To ensure water tightness of the valves under high humidity conditions, the conduit entrance to the coils were sealed with Dow Corning room temperature vulcanizing silicone rubber No. 738 RTV noncorrosive sealant. (See attachment 2). The sealant is rated at temperature to 260°F, and 10° rads radiation resistance base use after exposure.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 129

EQUIPMENT ITEM NO. 129

SOLENOID VALVE LOCATED IN THE ANNULUS

ASCO MODEL HV-206-380-2RVU

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 129

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): NOT STATED (FSV-32-81A, B; -103A, -111A, B; -103B)

LICENSEE SUBMITTAL: SCEW(S): MEB-65-022 (3.11-7 PAGE 4)

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	Checksneet Page No.
Equipment Item	la
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, 4£
Equipment Environmental Qualification Review	5 a, 5b, 5c, 5d, 5a, 5f, 5 g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	62,-65

Maintenance and Replacement Schedule Summary

70, 70, 70

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

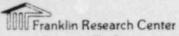
Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X Tas Licensee (has/herent) provid	led a response to the SER concerns.
The Licensee (has/has not) specification who environmental service conditions.	
Y The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by the tem.
Corrective action specified b	y the Licensee:
NAME OF TAXABLE PARTY O	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	or this TER for Legend)
I.a Qualified I.b Modification	Qualified Life Deficiency
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available

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FRC Assignment No. 13
FRC Task No. 519/526

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Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Est Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Req 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 Radiation Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied	quired)
Adequate Similarity Between Equipment and Test Specimen Estaging 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 Radiation Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied	quired)
Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established (If Regrogram 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 Radiation Satisfied Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied	quired)
qualified Life or Replacement Schedule Established (If Required rogram Established to Identify Aging Degradation criteria Regarding Aging Simulation Satisfied (If Required riteria 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 Radiation Satisfied criteria Regarding Radiation Satisfied criteria Regarding Test Sequence Satisfied	quired)
rogram Established to Identify Aging Degradation riteria Regarding Aging Simulation Satisfied (If Required riteria 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 riteria Regarding Spray Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied	
riteria Regarding Aging Simulation Satisfied (If Required riteria 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 riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied	
riteria 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 riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied	
o Peak Temperature Adequate o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied	
o Peak Pressure Adequate o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied	
o Duration Adequate o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied	
o Required Profile Enveloped Adequately o Steam Exposure (If Required) Adequate riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied	
o Steam Exposure (If Required) Adequate riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied	=
riteria Regarding Spray Satisfied riteria Regarding Submergence Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied	=
riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied	
riteria Regarding Test Sequence Satisfied	
	-
riteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
riteria Regarding Functional Testing Satisfied	
riteria Regarding Instrument Accuracy Satisfied	
est Duration Margin (1 hour + Function Time) Satisfied	
riteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	
	DESIGNATION:
RC QUALIFICATION CATEGORY	X = CATEGORY
.a Equipment Qualified	
.b Equipment Qualification Pending Modification	
I.a Equipment Qualification Not Established	
I.b Equipment Not Qualified	
I.c Equipment Satisfies All Requirements Except Qualif	
or Replacement Schedule Justified	_X_
II.a Equipment Exempt From Qualification	
II.b Equipment Not in the Scope of the Qualification Re	.v.ew
V Documentation Not Made Available	



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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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NOTES:
The Licensee has extrapolated the simulated
accident profile in order to attern a
16 was a solidio Die sationate de this
16 year qualifié Dife satimate for this equipment. The Licensee should satablish a conservative qualified life estimate that was mad use the accident profile as a Prasis.
equipment. The Literate whould satisfied
a conservative qualified life estimate
that was not use the accident profile
as a Prasis.

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
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FRC Task No. 519 /526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 130

EQUIPMENT ITEM NO. 130

SOLENOID VALVE LOCATED IN THE ANNULUS

ASCO MODELS 206-380 AND 206-381 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 130

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): NOT STATED (PSV-65-81, -83); REACTOR BUILDING ISOLATION

(FSV-32-80A, B; -102A, B; -110A, B); CONTAINMENT ISOLATION (FSV-43-77, -3, -12, -23, -35); RCS FLOW

CONTROL (FSV-68-308)

LICENSEE SUBMITTAL: SCEW(S): EEB-1020

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	la
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, 40, 4d, 4c, 4£
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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SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provided a response to the SER concerns.
The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
The Licensee has presented information which shows there are no outstanding qualification deficiencies.
The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
Corrective action specified by the Licensee:
Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress
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 III.a Exempt III.b Not in Scope II.b Not Qualified IV Documentation Not Available

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DECTCHATION.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 130

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Setween Equipment and Test Specimen E	stablished
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Re-	quired) X
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Require	d) ·
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:
NRC QUALIFICATION CATEGORY	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 Quali	fied Life
or Replacement Schedule Justified	_X_
III.a Equipment Exempt From Qualification	
III.b Equipment Not in the Scope of the Qualification R	eview
IV Documentation Not Made Available	
Sa item 124 and page 5+ for	. noitaulous

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NOTES:
The Licensee has extrapolated the simulated
accident profile in order to establish a 16 year
qualified life estimate for this equipment, this is not
considered an acceptable practice based on the
1 yr. operating requirement and 30 day test to which
the equipment was subjected. The Licensee
should establish a conservative qualified life estimate
based on the thermal aging test program and
the actual component application
the actual equipment application.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. /31

EQUIPMENT ITEM NO. 131

SOLENOID VALVE LOCATED OUTSIDE CONTAINMENT

ASCO MODEL 206-381

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 131

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): NOT STATED (LSV-3-175), SG LEVEL SOV (LSV-3-174);

RC DRAIN TANK TO DRAIN HEADER (FSV-77-17, -19, -10)

LICENSEE SUBMITTAL: SCEW(S): EEB-1020

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	la
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	16, 4b, 4e, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5o, 5d, 5e , 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

Maintenance and Replacement Schedule Summary 7a, 7b, 7e

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SUMMARY OF LICE	ENSEE RESPONSES TO THE	E NRC SER	- ONLY CHECKED ITEMS ARE	APPLICABLE
X The License	ee (has/ bas-not) provi	ided a res	ponse to the SER concerns	·
qualified a		when expos	tated that the equipment ed to the applicable DBE	is
	ee has presented infor g qualification defici		ich shows there are no	
	ee (has/has not) propo qualification has not		rective action for this e ly established.	quipment
	ication for interim og ee for this equipment		has/has not) been provide	d by the
Correct	tive action specified	by the Li	censee:	
Equ	uipment replacement wi			
	uipment relocation abo			
	locate or shield equip			
	rify qualification by			
	uipment relocation to			
	alification testing of her (equipmen	t in progress)
	an be construed as a b		mation for this equipment justification for interim	
The state of the s		le for acco	schedule for the propose omplishing the corrective	
	ee states that the equuld be exempted from e		em does not require quali	fication
	RESULTANT NRC QUALIFICANT (See Section 3		ALUATION CATEGORY BASED O	N REVIEW
T a Applified			Ounlified tife Definion	
I.a Qualified I.b Modificati		(11.3	Qualified Life Deficienc Exempt	A
	tion Not Established		Not in Scope	
II.b Not Qualif		IV.D	Documentation Not Availa	bla
TTID MOE QUALITY		14	Commencation Not Availa	DIG

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5191526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
NRC RECOTREMENTS	
Descumented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen E	stablished
Aging Degradation Evaluated Adequately	quired) X
Qualified Life or Replacement Schedule Established (If Re	quired)
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Require	d)
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:
NRC QUALIFICATION CATEGORY	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 Quali	fied Life
or Replacement Schedule Justified	X_
III.a Equipment Exempt From Qualification	
III.b Equipment Not in the Scope of the Qualification F	Review
IV Documentation Not Made Available	
Sa item 124 and page 5f for s	evaluation.

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NOTES:
The Licensee has extrapolated the simulated
accident profile in order to establish a 28 - year
qualified life estimate for this equipment, this is not
considered an acceptable practice based on the
1 yr. operating requirement and 30-day test to which
the equipment was subjected. The Licensee
should establish a conservative qualified life estimate
based on the thermal aging test program and
the actual equipment application.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 132

EQUIPMENT ITEM NO. 132

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 206-381-3RF

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 132

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): DAMPER ACTUATOR (FSV-65-52, -53, -30, -26, -27)

LICENSEE SUBMITTAL: SCEW(S): EEB-1020

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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3s, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	Sa, 5b, 5c, 5d, 5e , 5f, 5 g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7c

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

PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
Occumented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If	Required) X
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Requi	red)
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.	
	DESIGNATION:
NRC QUALIFICATION CATEGORY	X = CATEGORY
I.a Equipment Qualified	
I.b Equipment Qualification Pending Modification	
	_
II.a Equipment Qualification Not Established II.b Equipment Not Qualified	=
II.a Equipment Qualification Not Established II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qua	
II.a Equipment Qualification Not Established II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qua or Replacement Schedule Justified	alified Lize
II.a Equipment Qualification Not Established II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qua or Replacement Schedule Justified III.a Equipment Exempt From Qualification	_ <u>X</u> _
II.a Equipment Qualification Not Established II.b Equipment Not Qualified II.c Equipment Satisfies All Requirements Except Qua or Replacement Schedule Justified	<u>x</u>

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NOTES:
The Licensee has extrapolated the simulated
accident profile in order to establish a 30 - year
qualified life estimate for this equipment, this is not
considered an acceptable practice based on the
1 yr. operating requirement and 30-day test to which
the equipment was subjected. The Licensee
should establish a conservative qualified life estimate
based on the thermal aging test program and
the actual equipment application.
•

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 133

EQUIPMENT ITEM NO. 133

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL 206-381

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 133

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): CONTAINMENT HYDROGEN MONITORING (FSV-43-201, -202);

PRESSURIZER GAS/LIQUID (FSV-43-2, -11); RCS HOT LEGS (FSV-43-22); ACCUMULATOR TANK HEADER (FSV-43-34); EXCESS

LETDOWN HEAT EXCHANGER (FSV-43-74); NOT STATED

(FSV-68-308)

LICENSEE SUBMITTAL: SCEW(S): EEB-1020

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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3e, 3d
System Consideration Review	4a, 4b, 40, 4d, 40, 45
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5£, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

Maintenance and Replacement Schedule Summary

7a, 7b, 70

20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

Page 1b

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICAB	LE:
X The Licensee (has/because) 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/nas 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.	
DESTRUMENTAN OF DESTRUMENTANT NO. OUR LET CARTON THAT IN THE TOTAL CARTON OF THE CARTON	
- CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)	
() malified	
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	

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519 52-6

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NRC REO		DESIGNATION: = DEFICIENCY
THE CLUS		
Documen	ted Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establis	hed
aging D	egradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (If Required)	-
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	-
	Duration Adequate	
	Required Profile Enveloped Adequately	alles de la company de la comp
	Steam Exposure (If Required) Adequate	-
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies ny) Satisfied	
	a Regarding Functional Testing Satisfied	
	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	LIFICATION CATEGORY	X = CATEGORY
		X
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	fo
II.c	Equipment Satisfies All Requirements Except Qualified Li	re
	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 item 124 for actailed ever	

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 134

EQUIPMENT ITEM NO. 134

SOLENOID VALVE LOCATED IN THE CONTAINMENT

TARGET ROCK MODEL 775001

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 134

LICENSEE REFERENCE(S): 1564

FUNCTION (PLANT ID): DP ISOLATION VALVE (FSV-30-134, 135)

LICENSEE SUBMITTAL: SCEW(S): EEB-1001

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,

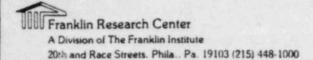
Not stated Not applicable

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	7 a, 7b, 7c

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UMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
The Licensee (has/	ded a response to the SER concerns.
	fically stated that the equipment is nen exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment in	eration (has/has not) been provided by the tem.
Corrective action specified b	by the Licensee:
	re submergence level ment from radiation source midditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
The state of the s	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
SIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3	Of this TER for Legend)
Qualified Modification	II.c Qualified Life Deficiency III.a Exempt
.a Qualification Not Established	III.b Not in Scope
.b Not Qualified	IV Documentation Not Available

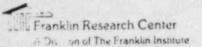


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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	ORM
		DESIGNATION:
NRC REQ	UIREMENTS	X = DEFICIENCY
	ted Evidence of Qualification Adequate	
	e Similarity Between Equipment and Test Specimen Estab	lished
	egradation Evaluated Adequately	
	ed Life or Replacement Schedule Established (If Requir	ed)
	Established to Identify Aging Degradation	
ritari	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	4000-01000
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	a Regarding Functional Testing Satisfied	
	a Regarding Instrument Accuracy Satisfied	
Took Du	gration Margin (1 hour + Function Time) Satisfied	
rest Du	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
criteri	a Regarding Margins Sacistied (NOREG-0300, Cat. 1)	
		DESIGNATION:
NRC OU	ALIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified	<u>×</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	
TVZ	Documentation Not Made Available	

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		ALIFICATION REVIEW	.,
Criteria: DOR Guidelines	NUREG-0588,	Cat. I; NUREG-0588, Cat.	II X.
NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	(X OR NOTE NO.)
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE NO.)
EQUIPMENT DESCRIPTION Equipment Type	Solenoid Valve	SOLENOID VALVE	
Manufacturer's Name (5.2.2/-/-)	Target Rock	TARGET ROCK	similarit verified
Model Number (5.2.2/-/-)	775-001	7766-001	by Target
Serial Number		MODIFIED TO SK-4017	Rock
Features/Mounting (5.2.6/-/-)	notstated	DUAL PILOT DISC. POTTED COIL 2500 Ib. ANSI 1IN. NORMALLY CLOSED	Corp.
Connections/Interfaces (5.2.6/-/-)		INTERNAL TERMINAL CONNECTIONS	
Location/Elevation	Containment		
Equipment ID No.	FSV-30-194		
QUALIFICATION REPORT	-135		:
(8.0/5.0/5.0)	!		
Report ID Number	17RP 2315	TRP-2375	
Report Date	(PGK# 1201)	9-26-79	
Issued by		TARGET ROCK CORP.	
Prepared for		TARGET ROCK CORP.	
Referenced Reports		East-West Technology Report No. 92906-9	
Qualification Method			
(5.1, 5.3/2.1, 2.4/2.1, 2.4)		! SEQUENTIAL TEST	
QUALIFICATION TEST PROGRAM Functional Test Description (5.2.5/2.2.9/2.2.9)		Seat Leakage test Operational test Position Indication	
O		I.R. tests	!
Operating Conditions (-/2.2.10/2.2.10)	1	: 2485 psig water supplied	:
Load/Cycles/Voltage/	1	! to inlet port	:
Current/Freq.	:	1120 VAC COIL VOLTAGE	:



A Dr. on of The Franklin Institute 20th and Race Streets. Phila Pa. 19103 (215) 448-1000 FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
(DOR/0588-I/0588-II)	1	1	1
Acceptance Criteria	1	Pass FUNCTIONAL	1
(5.2.5/2.2.1/2.2.1)	1	! TESTING OF TRP.2005	:
(3.2.3/ 2.2.2/ 2.2.2/	1		!
Accuracy (5.2.5/-/-)	1		
Number of Specimens		4	:
Test Instrument's Calibrated		EQUIPMENT LISTED IN	
		APPENDIX B	
Safety Function (Active/	Containment		
Passive) (-/2.1.3/2.1.3)	Isolation		!
Test Duration (5.2.1/-/-)		! ^	:
lest buracion (3.2.1)	. i	. 0	!
Accident Duration (Envir.	i.	:	:
Above Normal) (5.2.1/-/-)	1		
	1		:
Required Function Time	1 1		
	: lyear.		:
Test Sequence (General)		RAD TA SEIS STM+CHSP	;
(5.2.3/2.3.1/2.3.1)		, , ,	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)			
Cat. 1) (-/2.3.1/-)			:
1. Representative Sample	1		1
2. Baseline Data			:
3. Performance Extremes	1	:	!
4. Thermal Aging	1	1	:
5. Radiation Aging	:		
6. Wear Aging	1		
7. Vibration/Seismic	:		
8. DBE Exposure	:		
9. Post-DBE Exposure			
10. Inspection			
Aging .		! = = = @ 3 EO ° E	:
(5.2.4, 7.0/4.0/4.0)	;	792 hr.@ 350°F	:
Thermal Aging/Basis	1	40 YR. @ 140° F	:
Material Aging		(10°C RULE)	:
Evaluation (7.0/-/-)			1
27424442011 (7707 7 7	:		1
Materials Susceptible	:		:
(Thermal) (5.2.4, 7.0/-/-)	:	150	:
	1		:
Radiation Aging, Type	!	Land Line Democratic	
		GAMMA	

LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
:		
	2.27 x 107	i
	1.0 Mrd/h	1
	TEST	:
	18,000 cycles @ 122°F; 90%-L	
	4	
46 yrs.	40 4R + LOCA /40 4R.	
: 120°F :2.0x107rd (TID)		
	Target Rock may have established a maintenance/Replacement program	*
	46 yrs.	2.27 x 107 1.0 Mrd/h TEST 18,000 cycles @ 122°F; 90°Z, rh 120°F 2.0x10°rd(TID) 98 % Target Rock may have established a maintenance/Replacement

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR
(DOR/0588-I/0588-II)	! !	DOCUMENTATION	NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)		LOCA .	
Radiation Type	! !	GAMMA	
Radiation Dose (rd) (4.1.2/1.4/1.4)	10×10812	1.13 x 10 8	
Radiation Dose Rate (rd/hr)	! !	0.45 Mrd/h	
Radiation Qual. Method (5.3.1/-/-)		4	
Proximity to Concentrated	: :		:
Radiation (4.1.2/1.4.6/1.4.6)			
Equipment Susceptible to			
Beta Radiation (4.1.2/-/-)	!!		
Radiation Dose (Normal + Accident) (4.1.2/-/-)	1.20 × 10 3 d	1.35 × 10 8 rd.	
Plateout Dose Considered (-/1.48/1.48)			
Gamma + Beta Dose (rd)			

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519/526

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUASIFICATION DOCUMENTATION	(X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT COMDITIONS Rate of Temp./Press. Increase	MSLB 327 °F peak probable not algniseent	385°FIGGPSIS	
Peak: °F/psig/RH/Time Decrease To: °F/psig/RH/Time	see pg.5g	385/66/-/1.5 MIN. 365/65/-/9.5 MIN.	
Decrease To: °F/psig/RH/Time		312/65/-/468 MN.	
Decrease To: °F/psig/RH/Time		290/27.5/-/34 HR.	
Equipment Surface Tempera-		215/11/-/12.3 DAYS	
2.2.6/1.2.5.C, 2.2.6)	10.1847 miles	TEST	i
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	143 BO3		
Spray Composition (4.1.4/1.3, 2.2.8/	NaOH NaOH	BORIC ACID- HYDRAZINE	
1.3, 2.2.8)	. PH= 8.2	0.15	
Spray Density (gpm/ft ²)		20,160	
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)	:	:	

FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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NOTES:
1. The move performed entreportaily Defore, owing.
mitaquani Din et T. margarq, tast est adja cono
resistance Oropped to 3.5 - 4.0 megahna attor
Racciation expresses to 137 Mrd.
- Imapartim revealed degradation of the
to organ anadams guillass turemos uses at
the conquit connection. The organica seal
allowed Donated water spring to enter
go tea 1 priseurs transtragmas Astrua elt
intermittent relay contacts. Prishing of
the contacto resolved the problem.

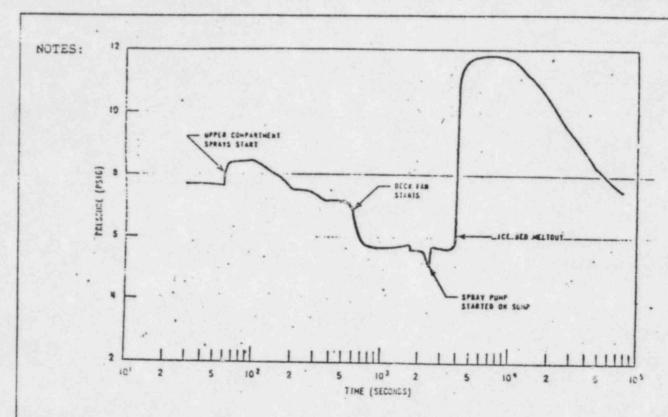


Figure B.1-1 - Containment Pressure - Double Ended Pump Suction Break

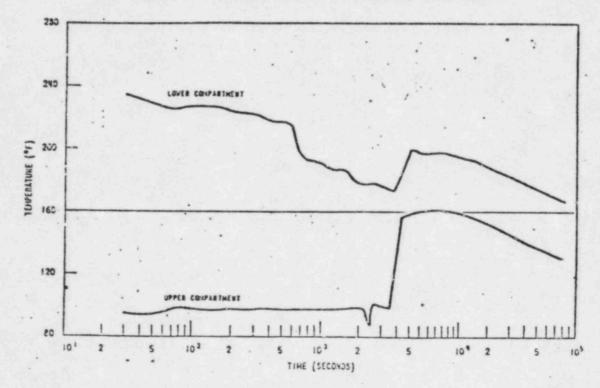


Figure 8.1-2 - Containment Temperature Double Finled Pump Suction Break

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 135

EQUIPMENT ITEM NO. 135

LIMIT SWITCH LOCATED IN THE ASNULUS

NAMCO MODEL EA170

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 135

LICENSEE REFERENCE(S): 1530, 4752

FUNCTION (PLANT ID): POSITION INDICATION (FLV-90-107, -111, -113, -117;

FCV-12-79)

LICENSEE SUBMITTAL: SCEW(S): EEB-1058 (3.11-5 PAGES 8, 9; 3.11-6 PAGE 24;

3.11-8 PAGE 36)

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

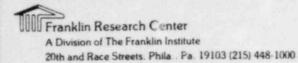
R, T, QT) RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

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	7 a, 7b, 7c

SUMMARY OF LICENSEE RESPONSES TO THE N	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/bes not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment it	ration (has/has not) been provided by the tem.
Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ac Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from environment	oment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established	III.b Not in Scope IV Documentation Not Available



III.b

IV

NRC Contract No. NRC-03-79-118
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FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 135

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a

Equipment Not in the Scope of the Qualification Review

Documentation Not Made Available

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NOTES:
The freise has Distribed references 1530 and 4752 as cridence
of qualification for this equipment iter the freense states that all the finites witches are subject to a DBE, or HAB
and so it it it and it to a Dallocal was
all the similarity are purget to a Doe, or Hoto
environment. The mobel EA 170 was Invironmentally tested
for rabiation, Thermal aging, seismic, and mechanical
aging. No testing is reported for simulation of HELB or
Local Distriction of Persons of the
LOCA consition. Therefore, The Device is assigned to
catigory It 3 " qualification not Established".

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. __5/9 / 52-6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 136

EQUIPMENT ITEM NO. 136

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA-170-302

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 136

LICENSEE REFERENCE(S): 4752, 1530

FUNCTION (PLANT ID): POSITION INDICATION (FCV-87-9, -10, -11)

LICENSEE SUBMITTAL: SCEW(S): NEB-87-45 (TABLE 3.11-6, PAGES 27, 28)

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,

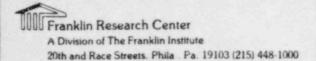
Not stated, Not applicable

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

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UMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICAE
The Licensee (has/ has nut) provid	ded a response to the SER concerns.
	fically stated that the equipment is nen exposed to the applicable DBE
The Licensee has presented informoutstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment in	eration (has/has not) been provided by the item.
Corrective action specified b	by the Licensee:
Equipment replacement with Equipment modification	th qualified equipment
Equipment relocation abov	
Relocate or shield equipm Verify qualification by a	
Equipment relocation to a	mild environment
Qualification testing of Other (equipment in progress
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment item asis for justification for interim
The Licensee (has/has not) pr corrective action. (Schedule action	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
SIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
a Qualified	II.c Qualified Life Deficiency
b Modification	III.a Exempt
.a Qualification Not Established .b Not Qualified	III.b Not in Scope IV Documentation Not Available
.p wee Againing	IV Documentation Not Available



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.a Equipment Qualified .b Equipment Qualification Pending Modification	TION
L.b Equipment Qualification Pending Modification	EGORY
L.b Equipment Qualification Pending Modification	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	
TY Description Not Made Assilable	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 136

LICENSEE RESPONSE TO NRC SER

Summary

Snaplock (NAMCO) limit switches on FCV-87-9, -10, and -11 are qualified. However, there is some uncertainty about the qualified life. Based on the test data currently available, qualification life is conservatively established as 2 years, and only interim qualification is claimed.

NAMCO has a test report to extend test conditions, which may be used in the future to better establish design life, but TVA does not have access to this report at this time. In the interim, and until analyses of the new test data can be performed, replacement will be scheduled after the qualified lifetime indicated above.

Discussion

1. Environmental Conditions:

These limit switches are located on System 87 (Upper Head Injection System) test line isolation valves. These valves are in a separate room (elevation approximately 714.0), adjacent to the containment, away from all HELB locations, especially away from nodes 2, 5, 6, 7, 10, and 17 where HELB temperatures exceed 200 F. Although not required to meet HELB, it might be interesting to note that the components' resistance to humidity is enhanced by its NEMA 4 enclosure.

Exposure to LOCA radiation is randled by showing that the components are qualified to the highest exposure in the entire auxiliary building, (1 x 10° rad) plus 40 year integrated normal dose of 1 x 10° rad maximum.

2. Qualification:

The conclusion that these switches are qualified for limited life is based on Ref. 1 through 3. Ref. 1 is the test report. It will be discussed further below, but in general, is adequate except for a question of qualified lifetime. Ref. 2 summarizes analyses done by NAMCO "to show that the service life of the EA-170 series limit switch exceeds 20 years, under normal service conditions" (i.e. series 170-302). Ref. 3 reiterates NAMCO's position that these components "are suitable for use in areas outside of the containment...".

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FRC Assignment No. 13,
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 136

LICENSEE RESPONSE TO NRC SER (Continued)

Further support is provided by NAMCO report QTR-107 which are results of the test outlined in the test plan, Ref. 4. QTR-107 is not currently in TVA's possession; hence it cannot be used at this time to fully qualify these switches. It will be used for interim qualification.

& Test Method and Setup:

Full type testing per Ref. 1 was done complying in some respects to to requirements for Category I plants, although Category II is all that is required. Test conditions and sequence were as follows:

Thermal aging - 200 F for 200 hours.

Mechanical aging - 100,000 acutation cycles, under electrical load.

Irradiation - 2.04 x 10 rad.

Seismic testing.

Category I plants should have the DBA conditions simulated last, which is taken to be LOCA irradiation. Hence, the sequence of the seismic and irradiation testing perhaps should have been reversed. (The sequence is correct for aging—the distinction above applies only to the DBA simulation.) However, it is believed that the given sequence is more severe because of potential weakening of materials prior to the seismic event which would not occur in the reversed sequence. Hence, the sequence is considered acceptable per the requirements for Category II plants.

Minor, but acceptable comments regarding the test are as follows:

Failure/success criterion were not reported to have been established in advance; however, data are sufficient for the user to determine acceptability.

Temperature was not stated to be measured near the surface of the component; however, test conditions assure temperatures very near the quoted 200 F. (See also the discussion of margins.)

There is no indication that the operation of the switches were at extremes (e.g. extreme voltage, current, etc.).

b. Test Conditions and Qualified Lifetime:

All test conditions exceeded the potential "accident" conditions. (Again, humidity is protected against by NEMA 4 enclosures.) However, interpretation of the test conditions is required to separate aging effects from accidental effects and determine qualified life. Radiation tests covered exposure for normal 40 year plus accident exposure. Thermal aging and accident lafe is of concern, and is discussed below.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 136

LICENSEE RESPONSE TO NRC SER (Continued)

Using the "10 C rule" (1) the test conditions per Ref. 1 (200 F/200 hour) are equivalent to 0.9 years at the maximum, normal temperature of 40 C (104 F), 1.4 years at 33 C (91 F), 2.9 years at 23 C (73 F, etc. A conservative application of this data could not support more than 1 year's operation, and an optimistic application might be a maximum of 3 years assuming "normal" environment in the building rather than the "worst possible."

QTR-107 (248 F/400 hr) would support over 11 years at 40 C (104 F), 23 years at 30 C (86 F), etc.

Ref. 2 claims to have established 20 years under normal service conditions, assuming a five year relubrication cycle. Without relubrication, 5 years would obviously be claimed.

- 3. Based on the above data and desirous of maintaining a margin conservative and appropriate to the analysis, a two year qualified life only is claimed, which is meant to be two years of aging plus another year of potential "postaccident" operation. Furthermore, only interim qualification is claimed, until either:
 - a. NAMCO QTR-107 is obtained and found adequate, or
 - b. the components are replaced prior to the 2 year term.

References:

- (1) "Qualification of NAMCO Controls Limit Switch Model EA-170-XX-302 to IEEE Standard 344 ('75) and Parts I and II of IEEE Standard 382 ('72)," Acme-Cleveland Development Company, Revision 1, July 24, 1978.
- (2) "Estimation of Service Life of EA-170-XX-302 Limit Switches for Class 1E Use, Outside of the Containment Area of Nuclear Power Plants," NAMCO Controls, November 9, 1979.
- (3) "Switches for Use in Nuclear Power Plant," from letter R. H. Kantner (NAMCO Controls) to L. Stefanek (TVA), February 23, 1981.
- (4) Test Plan No. LP10767-2, Rev. 3, for NAMCO Controls EA-170-XX-302, November 2, 1979.

^(1.) A more sophisticated method is not warranted in view of the large difference in claimed lifetime per various sources.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 137

EQUIPMENT ITEM NO. 137

LIMIT SWITCH LOCATED IN THE CONTAINMENT

NAMCO MODEL EA-180

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 137

LICENSEE REFERENCE(S): 3293

FUNCTION (PLANT ID): POSITION INDICATION (VARIOUS)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): MEB-313-045, EEB-1051 (3.11-4 PAGE 23, 24, 26,

27, 28)

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	la
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, 4£
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, 7o-

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FRC Task No. 5/9/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/h as not) provide	ed a response to the SER concerns.
Y The Licensee (has/has tot) specific qualified and/or will function who environmental service conditions.	
The Licensee has presented information outstanding qualification deficien	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment it	ration (has/has not) been provided by the tem.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualification ironmental qualification.
	TION EVALUATION CATEGORY BASED ON REVIEW
CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
a Qualified b Modification	II.c Qualified Life Deficiency III.a Exempt
I.a Qualification Not Established	III.b Not in Scope IV Documentation Not Available

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FRC Project No. C2257
FRC Assignment No. 13
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 137

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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) DESIGNATIO : X = CATEGORY NRC QUALIFICATION CATEGORY I.a Equipment Qualified I.b Equipment Qualification Pending Modification Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b

Documentation Not Made Available

IV

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		ALIFICATION REVIEW	** 12
Criteria: DOR Guidelines	; NUREG-0588,	Cas. I; NUREG-0588, Cat.	. II X.
NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X GR NOTE NG.)
EQUIPMENT DESCRIPTION Equipment Type	LIMIT Switch	Limit Switch	
Manufacturer's Name (5.2.2/-/-)	NAMCO	NAMCO Controls	
Model Number (5.2.2/-/-)	EN 180	EA-180, Type 23	
Serial Number	INCT STATED	EA-180-11302,RevD	
Features/Mounting (5.2.6/-/-)	NOT STATED	Horizontal in Autoclave	
Connections/Interfaces (5.2.6/-/-)		Teflon Tape used to seal conduit threads	See Note
Location/Elevation	VARENS	Not Applicable	
Equipment ID No.	VARIOUS VARIOUS	Not Applicable	!
QUALIFICATION REPORT (8.0/5.0/5.0) Report ID Number	! ! QTR-105	QTR-105	
Report Date		AUGUST 28, 1980	:
Issued by		ACME CLEVELAND DEVELOPMENT	
Prepared for		COMPANY NAMCO CONTROLS	
Referenced Reports		Not Stated	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	:	Sequential Test	:
QUALIFICATION TEST PROGRAM Functional Test Description (5.2.5/2.2.9/2.2.9)	NOT STATED	Make/break contact	!
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.		0.5Amps @ 100 Vdc	!

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	NOT STATED	Not Stated	:
Accuracy (5.2.5/-/-)	NIA	Not Stated	
Number of Specimens	NA	One (1)	
Test Instruments Calibrated	: N/A	Yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	ACTIVE	Active	
Test Duration (5.2.1/-/-)	NIA	30 days	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	7105 seconds	Not Applicable	
Required Function Time	: IYEAR	Not Applicable	NOTE 2
Test Sequence (General) (5.2.3/2.3.1/2.3.1) 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		Inspection/Base line data Heat/Humidity Aging Mechanical Aging Irradiation Seismic testing LOCA Simulation	
(5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	NoT STATOD	400 hrs@ 120°C	
Material Aging Evaluation (7.0/-/-)	NOT STATED	Not Stated	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	NOT STATED	PLASTOMBEIC COMPONENTS	
Radiation Aging, Type	GANMA	Gamma	:

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION (X OR DOCUMENTATION NOTE NO.)
Radiation Aging, Dose (rd)	2.0x 107	204 Megarads *
Radiation Aging, Dose Rate	NOT STATED	0.91 Megarads/ hour
Radiation Aging, Method	Test	Test
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	NOT STATED	Not Stated
Operational Aging (-/4.2/-)	NIA	100,000 Actuation Cycles
Other Age Conditioning (-/4.2/-)	N/A	Not Stated
Qualified Life Claimed/ Established (5.2.4/4.19/-)	8.3 years	5 years @ 55°C
Normal Ambient Temperature Normal Ambient Radiation Normal Ambient Humidity	! 110°F ! NOT STATED ! 98%	Not Applicable Not Applicable Not Applicable
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	NOT STATED	EA 189 90051
On-Going Analysis of Failures and Degradation (7.0/-/-)	NIA	Not Applicable
Margin (General) (6.0/3.0/3.0)	NOTE 3	Not Stated/ Not Appicable
Margin (NUREG-0588, Cat. I) (-/3.2/-) 1. Temperature (+15°F) 2. Pressure (+10%, 10 psig max) 3. Radiation		Not Stated
<pre>(not required) 4. Time (+10%, +1 hour</pre>		

^{*} Radiation aging and accident doses were combined in a single Exposure prior to the LOCA Simulation.

NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	DEFICIENCY (X OR
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	LOCA/MSLB	LOCA/MSLB	
Radiation Type	GAMMA	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	1.0 × 108	204 Megarads	*
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	NOT STATED	0.91 Megarads per hour Test	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	NOT STATED	Not Applicable	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)	NIA	Not Stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	N/A	Not Stated	
Plateout Dose Considered (-/1.48/1.48)	NOT STATED	Not Applicable	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	NOT STATED	Not Applicable	

^{*}Radiation aging and accident doses were combined in a single Exposure prior to the LOCA Simulation.

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE No.)
(DOR) 0366-17 0366-11)	! !	DOCCHINITATION	!
OF ACCIDENT CONDITIONS			:
Rate of Temp./Press. Increase	7	11°F/8psi/sec	
Peak: °F/psig/RH/Time	/ san one	340/115/100/3 hrs	
Decrease To: °F/psig/RH/Time	See page	140/-/-/2hrs 340/105/100/3hrs	
Decrease To: °F/psig/RH/Time	1	320/76/100/2hrs	
Decrease To: °F/psig/RH/Time		250/25/100/4days 200/10/100/25 days	
Equipment Surface Temperature (MSLB) (-/1.2.5.C,	WOT STATED	Not Applicable	
2.2.6/1.2.5.C, 2.2.6)			:
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	TesT	Test	
Spray Composition	10. 1847 ~ 11th Boy		
(4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	PH= 8.2	Boric Acid/water/sodium thiosulfate/sodium hydro: ide	x :
Spray Density (gpm/ft ²)	NOT STATED	0.15	
Spray Duration	NOT STATED	30Days	
Submergence Duration (4.1.3/2.2.5/2.2.5)	-	Not Applicable	
In-Leakage Considered (5.2.6, 5.3.2/-/-)	-	Not Applicable	
Time to Submergence	-	Not Applicable	
Dust Environment	- :	Not Applicable	1
(-/2.2.11/2.2.11)	! !		!

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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NOTES:
1. The report states:
Conduit sealing, the test report states that teflon
tape was used to seal the conduit threads during
LOCA test, it must be noted that teflon tape was
not used during radiation simulation and further,
that no attempt was made to qualify a type of
thread sealant. During installation of the limit
switch it is the customers responsibility to main-
tain the integrity of the switch enclosure.
The licensee has not identified The method want to ensure the
The Jicensee has not identified The method wal to ensure the integrity of The Thread sealant.
2. The breeze states That additional testing or analysis is
2. The breise states That additional testing or analysis is required to satisfy the I year post-local agerational
requiement.
3. The lice see states that the test origina priviles margin
to meet IEEE 323-1974 when a companion is make with
Dlant operating conditions.
In conclusion, it must be noted that with The use of qualified
Sheet cealants, the Denice would be qualified for its use,
with The exception of Those subject to submurgery, and the
resolution of the extended post-loca serial.

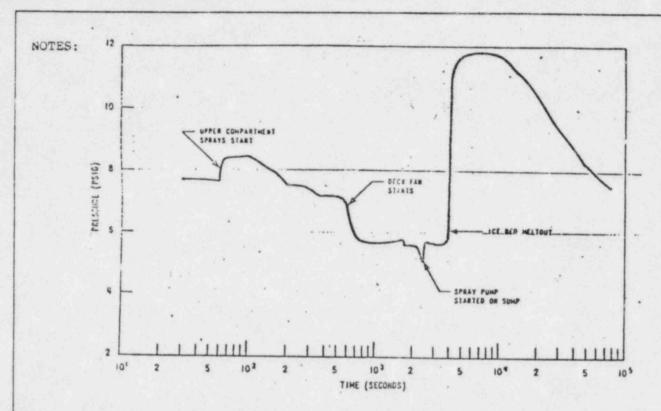


Figure 8.1-1 - Containment Pressure - Double Ended Pump Suction Break

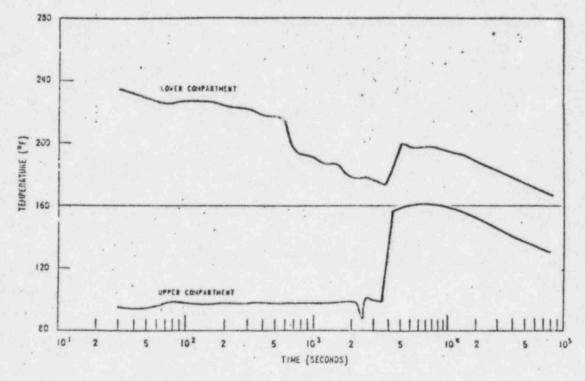


Figure 8.1-2 - Containment Temperature Double Ended Pump Suction Break

A Division of The Franklin Institute 20th and Race Streets, Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. /38

EQUIPMENT ITEM NO. 138

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA180

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 138

LICENSEE REFERENCE(S): 3293

FUNCTION (PLANT ID): CONTAINMENT SUMP ISOLATION VALVE (FCV-63-72, -73)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-50 (3.11-7 PAGE 11)

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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3o, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5a, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7o

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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MMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICAB
The Licensee (has/has-mot) provid	led a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by the tem.
Corrective action specified b	y the Licensee:
Equipment replacement wit	
Equipment relocation abov	
	ent from radiation source dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of Other (
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
IGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW
IRCLED ITEM ONLY: (See Section 3	or this TER for Legend)
Qualified	II.c Qualified Life Deficiency
Modification	III.a Exempt
a Qualification Not Established	III.b Not in Scope
b Not Qualified	IV Documentation Not Available

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. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. /38

POLITONENE PRESENTAL QUALIFICATION SIMMARY FORM

NRC REQ	UIREMENTS	DESIGNATION: <u>X</u> = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished X
aging D	egradation Evaluated Adequately	-
ualifi	ed Life or Replacement Schedule Established (If Require	d)
rogram	Established to Identify Aging Degradation	-
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
0	Peak Pressure Adequate	
0	Duration Adequate	
0	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Cualification 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	
	Documentation Not Made Available	

FOR EVALUATION SEE ITEM 137

NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO./39

EQUIPMENT ITEM NO. 139

LIMIT SWITCH LOCATED IN THE CONTAINMENT

NAMCO MODEL EA180

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 139

LICENSEE REFERENCE(S): 3293

FUNCTION (PLANT ID): CONTAINMENT ISOLATION VALVES (FCV-62-72, -73, -74,

FCV-77-16, FCV-87-7, -8)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1062 (3.11-4 PAGES 26, 27)

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, (S) (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	la
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

-7a, 7b, 7c-

Maintenance and Replacement Schedule Summary

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has net) provided	d a response to the SER concerns.
The Licensee (has/hes not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) proposed item whose qualification has not be	d a corrective action for this equipment een fully established.
Justification for interim operations. Licensee for this equipment its	ation (has/has not) been provided by the em.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by add Equipment relocation to a relocation testing of economic process.	submergence level nt from radiation source ditional (testing/analysis) mild environment
	r information for this equipment item is for justification for interim
	vided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipment and/or should be exempted from envi	ment item does not require qualification ironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON REVIEW f this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 18
FRC Task No. 5/9/526

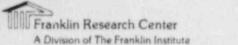
Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 139

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	<u>w</u>
		DESIGNATION:
NRC REC	UIREMENTS	X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establi	ished X
	Degradation Evaluated Adequately	-
Qualifi		
Program		
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
0	Peak Pressure Adequate	
0	Duration Adequate	
0	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
Criteri	a Regarding Spray Satisfied	
Criteri	ia Regarding Submergence Satisfied	
Criteri	a Regarding Radiation Satisfied	
Criteri	ia Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
(If A	Any) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criter	a Regarding Instrument Accuracy Satisfied	-
Test Du	gration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION
NDC OU	ALIFICATION CATEGORY	X = CATEGOR
MAC QUA	ALIFICATION CATEGORI	A CHILDON
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Mod.fication	CONTRACTOR
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified	ife
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	-
IV	Documentation Not Made Available	

FOR EVALUATION SEE ITEM 137

Note: Device may be subjected to submergence during accordent conditions.



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. ____5/9 /5≥6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 140

EQUIPMENT ITEM NO. 140

LIMIT SWITCH LOCATED IN THE ANNULUS

MICRO SWITCH MODEL OPDAR7905

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 140

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): ANNULUS ISOLATION VALVES (NOT DEFINED)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): MEB-313-039 (3.11-5 PAGE 8)

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

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

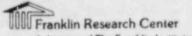
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

Page

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. X 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 (SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
qualified and/or will function when exposed to the applicable DBE environmental service conditions. The Licensee has presented information which shows there are no outstanding qualification deficiencies. X The Licensee (***C*/has not) proposed a corrective action for this equipment item whose qualification has not been fully established. X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item. Corrective action specified by the Licensee: Equipment replacement with qualified equipment Equipment modification Equipment modification 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) Leg Qualified Lice Qualified Life Deficiency	X The Licensee (has/has not) provid	ded a response to the SER concerns.
outstanding qualification deficiencies. The Licensee (***********************************	qualified and/or will function wh	en exposed to the applicable DBE
item whose qualification has not been fully established. X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item. Corrective action specified by the Licensee: Equipment replacement with qualified equipment Equipment modification Bquipment 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		
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		
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		
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/nas 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	Corrective action specified b	y the Licensee:
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 modification	
	Delegate or shield souther	
	Verify qualification by a	dditional (testing/analysis)
	Equipment relocation to a	mild environment
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 Qualified Life Deficiency		
	that can be construed as a ba	
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 Life Deficiency	corrective action. (Schedule	for accomplishing the corrective
- CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend) I.a Qualified Life Deficiency		
- CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend) I.a Qualified Life Deficiency	DESIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON BEULEW
II.a Qualification Not Established III.b Not in Scope	I.b Modification	III.a Exempt
II.b Not Qualified IV Documentation Not Available		



A Division of The Franklin Institute 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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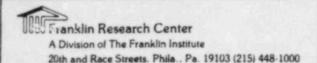
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DESIGNATION:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 140

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS		X = DEFICIENCY
Documented Evider	nce of Qualification Adequate	_X_
Adequate Similari	ity Between Equipment and Test Specimen Estab	
Aging Degradation	Evaluated Adequately	
Qualified Life or	Replacement Schedule Established (If Requir	
Dragram Fetablish	ned to Identify Aging Degradation	
Critoria Pogardir	ng Aging Simulation Satisfied (If Required)	
Criteria Regardir	ng Temperature/Pressure Exposure:	
	erature Adequate	
	sure Adequate	
o Duration		AND DESCRIPTION OF THE PARTY OF
	Profile Enveloped Adequately	
	osure (If Required) Adequate	-
		Community of the Commun
	ng Spray Satisfied	
	ng Submergence Satisfied	
	ng Radiation Satisfied	-
Criceria Regardi	ng Test Sequence Satisfied	
	ng Test Failures or Severe Anomalies	
(If Any) Satis		-
	ng Functional Testing Satisfied	
Criteria Regardi	ng Instrument Accuracy Satisfied	-
Test Duration Man	rgin (1 hour + Function Time) Satisfied	-
Criteria Regardi	ng Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUALIFICATION	N CATEGORY	X = CATEGORY
T . Fautoman	t Qualified	
	t Qualification Pending Modification	-
		X
	t Qualification Not Established	
	t Not Qualified	Life
	t Satisfies All Requirements Except Qualified	MALC
	cement Schedule Justified	
	t Exempt From Qualification	
	t Not in the Scope of the Qualification Revie	w
IV Document	ation Not Made Available	-



PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____5/9/526_

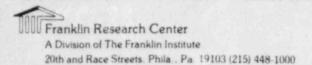
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 140

LICENSEE RESPONSE TO NRC SER

Appendix 2

Micro Switch has a line of standard basic switches which have a wide range of operating characteristics, temperature tolerances, and sealing materials. Their basic switch is comprised of phenolic, beryllium copper, and silver with capabilities of 400° F. Although qualified documentation is not available at this time, it is TVA's engineering judgement, based on past experience, that the switch will perform satisfactorily. TVA will commit to type tests or a replacement program in order to ensure the utilization of qualified components.



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FRC Project No. C5257
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FRC Task No. _____5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 141

EQUIPMENT ITEM NO. 141

LIMIT SWITCH LOCATED IN THE ANNULUS

NAMCO MODEL EA700

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 141

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): REACTOR BUILDING ISOLATION (NOT DEFINED)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1057 (3.11-5 PAGE 7)

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, M, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

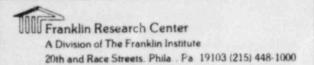
Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
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Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3o, 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

7a, 7b, 7c

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The Licensee (has/has not) provided a response to the SER concerns. The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions. The Licensee has presented information which shows there are no outstanding qualification deficiencies. X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established. X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item. X Corrective action specified by the Licensee: X Equipment replacement with qualified equipment Equipment modification Equipment 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 (
qualified and/or will function when exposed to the applicable DBE environmental service conditions. The Licensee has presented information which shows there are no outstanding qualification deficiencies. X The Licensee (has/has net) proposed a corrective action for this equipment item whose qualification has not been fully established. X Justification for interim operation (has/has net) been provided by the Licensee for this equipment item. X Corrective action specified by the Licensee: X Equipment replacement with qualified equipment Equipment modification Equipment 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 (
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Licensee for this equipment item. X Corrective action specified by the Licensee: X Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress Other (
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 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 (bas/nas 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 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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FRC Task No. 5/9/526

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	RM
		DESIGNATION: X = DEFICIENCY
NRC REQ	UIREMENTS	A - DULLCLUNGS
Documen	ted Evidence of Qualification Adequate	<u>x</u>
Adequat	e Similarity Between Equipment and Test Specimen Establ	ished
Aging D	egradation Evaluated Adequately	
Qualifi	ed Life or Replacement Schedule Established (If Require	d)
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	-
	Duration Adequate	-
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NDA OUR	TTRICAMION CAMECORY	X = CATEGORY
NRC QUA	LIFICATION CATEGORY	A - CHILDONI
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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NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB-1057 Ravision Appendix 2 Sheet 1 of 1

1. The limit switches are required to operate in the following environment:

Temperature:

150°F

Pressure:

Atmospheric

Relative Humidity:

100%

Radiation: 2x107 rads

2. The manufacturer's specifications for the limit switches are as follows:

Temperature:

1940F

Pressure: Relative Humidity: MEMA 4 Enclosure

Atmospheric

Radiation:

Not Specified

3. See generic position 4.1.8 for relative humidity.

4. Available documention indicates that the limit switches are not qualified for their radiation environment. Switches will be replaced as determined by the resolution of MCR SQNEEB8104.

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FRC Assignment No. 13
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 142

EQUIPMENT ITEM NO. 142

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA700

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 142

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): UNIT 1 SHIELD BUILDING EXHAUST (NOT DEFINED)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): MEB-65-032R1 (3.11-7 PAGES 22, 23)

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, (M), RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

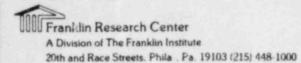
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
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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20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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SUMMARY	OF LICENSEE RESPONSES TO THE NR	C SER - ONLY CHECKED ITEMS ARE APPLICABL
× The	E Licensee (has/has-not) provided	a response to the SER concerns.
qua	e Licensee (has/has not) specific alified and/or will function when vironmental service conditions.	ally stated that the equipment is exposed to the applicable DBE
	Licensee has presented informat estanding qualification deficienc	
	Licensee (has/has not) proposed on whose qualification has not be	a corrective action for this equipment en fully established.
	Justification for interim opera Licensee for this equipment ite	tion (has/has not) been provided by the m.
	Corrective action specified by	the Licensee:
	Equipment replacement with a Equipment modification Equipment relocation above a Relocate or shield equipment Verify qualification by add Equipment relocation to a management relocation re	submergence level t from radiation source itional (testing/analysis) ild environment
-	The Licensee has provided other that can be construed as a basis operation.	information for this equipment item s for justification for interim
	The Licensee (has/has not) province corrective action. (Schedule for action	ided a schedule for the proposed or accomplishing the corrective
CONTRACTOR AS	Licensee states that the equipment of the Licensee states the Licensee sta	ent item does not require qualification conmental qualification.
-	TION OF RESULTANT NRC QUALIFICAT. LED ITEM ONLY: (See Section 3 of	ION EVALUATION CATEGORY BASED ON REVIEW this TER for Legend)
.b Mo	dalified diffication Not Established	II.c Qualified Life Deficiency III.a Exempt
Section of the latest section in the latest	alification Not Established/ et Qualified	III.b Not in Scope IV Documentation Not Available



IV

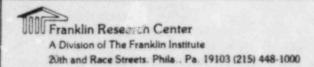
Documentation Not Made Available

NRC Contract No. NRC-03-79-118
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FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 142

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified III.a Equioment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 140

LICENSEE RESPONSE TO NRC SER

MEB-65-032 Appendix II

To date test data has not been obtained for Namco model EA 700 limit switch; however, test data is available for similar Namco limit switches (EA 170, 180, 740). The manufacturer reports that the EA 700 is a high quality switch, similar to the tested models, and is rated for 90°C (194°F). It has a weather proof housing. Test results for the similar models show that they would meet the required environmental conditions. Thus, engineering judgement indicates that Namco model EA 700 will meet the environmental and operating requirements. TVA will type test these switches to confirm the above or replace them with qualified models.

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FRC Task No. ____5/9 / 5a6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 143

EQUIPMENT ITEM NO. 143

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA700

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 143

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): VALVE POSITION INDICATION (FCV-1-149, -148, -147, -150,

-14, -32, -7, -25)

SERVICE: POSITION INDICATION

LICENSFE SUBMITTAL: SCEW(S): EEB-1056 (3.11-8 PAGES 39, 40)

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, (M) RPN, EXN, SEN, (QT) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

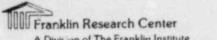
Contents	Checksheet Page No.
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Licensee Response to NRC SER	3a, 3b, 3c, 3d
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Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5£, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	.6a, 6b
	Santa and Later Committee

7a, 7b, 7c

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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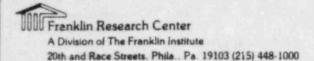
SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
★ The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specification who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has-not) proposed item whose qualification has not it	ed a corrective action for this equipment been fully established.
	ration (has/has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by acceptance of the second control of the second	e submergence level ent from radiation source dditional (testing/analysis) mild environment
Other (er information for this equipment item sis for justification for interim
The Licensee (hes/has not) proceedive action. (Schedule action)	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from env	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established II.b Not Qualified	
TILD HOE RUGITITIES	IV Documentation Not Available



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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	RM
		DESIGNATION:
NRC REQU	IREMENTS	X = DEFICIENCY
Document	ed Evidence of Qualification Adequate	X
Adequate	Similarity Between Equipment and Test Specimen Establ	ished
Aging De	gradation Evaluated Adequately	4)
Qualifie	d Life or Replacement Schedule Established (If Require	
Program	Established to Identify Aging Degradation	
Criteria	Regarding Aging Simulation Satisfied (If Required)	
	Regarding Temperature/Pressure Exposure:	
	eak Temperature Adequate	
	eak Pressure Adequate uration Adequate	
	equired Profile Enveloped Adequately	
	team Exposure (If Required) Adequate	
	Regarding Spray Satisfied	
Critoria	Regarding Submergence Satisfied	
Criteria	Regarding Radiation Satisfied	
Criteria	Regarding Test Sequence Satisfied	
Criteria	Regarding Test Failures or Severe Anomalies	
	y) Satisfied	
Criteria	Regarding Functional Testing Satisfied	
Criteria	Regarding Instrument Accuracy Satisfied	
Test Dur	ation Margin (1 hour + Function Time) Satisfied	
Criteria	Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION
	TOTAL CAMEGOON	X = CATEGOR
NRC QUAL	IFICATION CATEGORY	a chizoon
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.D	Equipment Not in the Scope of the Qualification Review	
TV	Documentation Not Made Available	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB-1056 Revision 1 Appendix 2 Sheet 1 of 1

1. The limit switches are required to operate in the following environment:

Temperature:

307°F

Pressura:

24.4 PSIA

Relative Humidity:

Radiation:

100%

NA

2. The manufacturer's specifications for the limit switches are as follows:

Temperature:

1940F

Pressure:

Atmospheric

Relative Humidity:

NEMA 4 Enclosure

Radiation:

Not Specified

3. See generic position 4.1.8 for relative humidity.

4. Available documentation indicates that the limit switches are not qualified for their temperature or pressure environment. Switches will be replaced as determined by the relilution of NCR SQNEEB8104.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 144

EQUIPMENT ITEM NO. 144

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA170

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 144

LICENSEE REFERENCE(S): 1530, 4750

FUNCTION (PLANT ID): POSITION INDICATION (FCV-65-47A, B, 28A, B, 8, 51,

FCO-65-10, 30, 52, 53)

LICENSEE SUBMITTAL: SCEW(S): MEB-65-041 (3.11-7 PAGES 22, 23)

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:

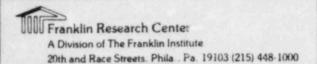
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System Consideration Review	4a, 4b, 40, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	62, 6b

7a, 7b, 7c

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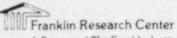
SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS	ARE APPLICABLE
The Licensee (has/has no) provided a response to the SER con	cerns.
Y The Licensee (has/has not) specifically stated that the equip qualified and/or will function when exposed to the applicable environmental service conditions.	
The Licensee has presented information which shows there are outstanding qualification deficiencies.	no
The Licensee (has/has not) proposed a corrective action for titem whose qualification has not been fully established.	his equipment
Justification for interim operation (has/has not) been pr Licensee for this equipment item.	ovided by the
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 equipathat can be construed as a basis for justification for in operation.	pment item terim
The Licensee (has/nas not) provided a schedule for the processing the corrective action. (Schedule for accomplishing the correction	
The Licensee states that the equipment item does not require and/or should be exempted from environmental qualification.	qualification
DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASE-CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)	SED ON REVIEW
I.a Qualified I.b Modification II.a Qualification Not Established III.b Not in Scope II.b Not Qualified IV Documentation Not As	



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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO.	RM
		DESIGNATION: X = DEFICIENCY
NRC REQ	UIREMENTS	A - DEFICIENCE
Occument Adequate Aging D Qualifi Program Criteri Crit	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Establ egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Require Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Required) a Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate a Regarding Spray Satisfied a Regarding Submergence Satisfied a Regarding Test Sequence Satisfied a Regarding Test Failures or Severe Anomalies any) Satisfied a Regarding Functional Testing Satisfied a Regarding Instrument Accuracy Satisfied	_X_
est Du Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification Equipment Qualification Not Established	
II.a	Equipment Not Qualified	11 1 2 1 Total
II.b	Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified	Life
II.c	or Replacement Schedule Justified	X_
***	Equipment Exempt From Qualification	-
III.a	Equipment Not in the Scope of the Qualification Review	
III.b	Documentation Not Made Available	
IV	DOCUMENTATION NOT MADE AVAILABLE	-



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FRC Task No. 519 526

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Nomine
NOTES:
N 0. 0 11 0 000 0 1
The freeze has Referenced PGR 1530, and 4750 as evidence of
qualification for this equipment iten. The proport patrifices the
quarter of the state of the sta
a qualified life Grenestative naintenance Origian.
requirements of or Onese almees with our of the problems of toroughing
a analyted life topenentaline maintenance Ortgram.

A Division of The Franklin Institute 20th and Race Streets. Phila . Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 145

EQUIPMENT ITEM NO. 145

LIMIT SWITCH LOCATED IN VARIOUS LOCATIONS

NAMCO MODEL EA-170

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 145

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POSITION INDICATION (FCV-61-96, 110, 191-193;

FCV-62-128, -140, -143, -144, -69, -70, -77; FCV-63-3,

-4, -8, -11, -23, -38, -41, -42, -64, -84, -175;

FCV-68-305, -307; FCV-74-3, -21; FCV-77-10, -17, -19, -20; FCV-87-21, -22, -23, -24; ZS-63-1, -67, -80, -98,

-118, -5)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-44

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:

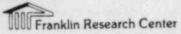
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	42, 4b, 40, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b.
Maintenance and Replacement Schedule Summary	7a, 7b, 7a-

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/has not) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has not) propositem whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	ration (has/was not) been provided by the tem.
➤ Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment	e submergence level
	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of of Other (equipment in progress
	er information for this equipment item sis for justification for interim
The state of the s	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from environment	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established II.b Not Qualified	IV Documentation Not Available



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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	<u>RM</u>
una neo	HIT DOMPLING	DESIGNATION: X = DEFICIENCY
NRC REQ	UIREMENTS	11 11 11 11 11 11 11 11 11 11 11 11 11
Adequat	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Establ egradation Evaluated Adequately	ished
ualifi	ed Life or Replacement Schedule Established (If Require	d)
rogram	Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
Criteri	a Regarding Submergence Satisfied	
Criteri	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
Criteri	a Regarding Functional Testing Satisfied	-
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
Criter	a Regarding Margins Sacriffed (Moross-0500, Cat. 1)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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 or Replacement Schedule Justified	Life
III.a	Equipment Exempt From Qualification	
d.III	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. .

LICENSEE RESPONSE TO NRC SER

Summary

The EA-170-100 (D2400X) components listed above may be exposed to the harsh environment resulting from a LOCA or HELB. According to the attached letter from Kantner to Stefanek, these limit switches are "suitable for use in an ambient of 90 C, but is not suitable for other than a general use, and (not for) unusual environmental conditions. This switch has been seismically qualified...".

The EA-170-302 components listed above are inside containment (excluding the EA-170-302 on FCV-8:-12, which is outside). EA-170-302 "are suitable for use in areas outside of the containment...", according to the same letter. They are not qualified for use inside containment per NUREG 0588 requirements.

Accordingly, all the components listed in Appendix 1 (excluding EA-170-302 on FCV-81-12) are to be replaced. The information below provides interim qualification justification for continued operation until these components can be replaced, approximately June, 1982. Interim qualification is based on safety evaluation NEB 810609 259 and equipment qualification work beyond the attached letter as discussed below.

EA-170-100 Inside Contairment - Interim Qualification

The following are inside containment:

Limit switches on...FCV-62-69 ee FCV-62-70

1-PCV-68-334

1-1-00-334

1-PCV-68-340A

Zone switches on... ZS-63-67

ZS-63-80

ZS-63-98

ZS-63-118

FCV-62-69 and -70 limit switches can fail in a manner that would cause the associated valve to take inappropriate action. However, the safety evaluation shows that redundant signals elsewhere and/or redundant valves will accomplish the necessary safety function.

The remaining six switches do not affect valve positions, according to the safety evaluation, but do affect status as reported in the control room. The major hazard is, therefore, that the operator will take inappropriate action based on this information. However, other qualified equipment is available to provide correct information.

- * EA-170-302 on FCV-81-12 is addressed in EQS NEB-81-41.
- •• FCV-62-70 is subject to submergence.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. _

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LICENSEE RESPONSE TO NRC SER (Continued)

EA-170-100 Outside Containment - Interim Qualification

The other EA-170-100 switches in Appendix 1 are outside containment. Only FCV-68-307 is located in the annulus. The safety evaluation (NEB 810609 259) shows that switch failure does not cause this valve to take inappropriate action, but only affects indicating lights in the control room. The other EA-170-100 switches outside containment are located in the auxiliary building either in individually cooled room, in general spaces, and/or at node locations 2, 15, or 17. The qualification of limit switches against the worst of these conditions is discussed below.

- a. Temperature, Pressure, and Humidity: Maximum accident temperature is 215 F, only 21 F higher than the 90 C (194 F) quoted by the NAMCO letter. Maximum accident pressure is 1.6 psig, not significantly different than normal atmospheric pressure. Maximum humidity is 100%; however, the switches are enclosed in NEMA 4 enclosures (see letter) which will protect against humidity for the short term when operation is critical.
- b. Radiation: Maximum accident radiation is 1 x 10⁷ rads integrated dose. No data are available to TVA to evaluate whether the switch could be qualified for such exposure. However, the EPRI Equipment Qualification Data Bank shows that radiation qualification has been done (assumed to be all by analysis) by Nebraska Public Power of Cooper 1 (2 x 10⁵), by Carolina Power and Light on Brunswick 1 and 2 (1 x 10⁵), and by Portland General Electric on Trojan 1 (8 x 10⁵). (Normal radiation to be added to the accident is negligible, being 1 x 10⁵ rads for 40 year life. Recall these components will replaced shortly, thus seeing a fraction of 1 x 10⁵.)
- c. Operating Time: No data are available regarding time the equipment is capable of operating at accident conditions.
- d. Chemistry (Caustic Spray), Submergence, Dust, Accuracy: Not applicable.
- e. Aging: In view of previous applications of these types of switches in normal environments, and of the short time before replacement, aging is not an issue.
- f. Margin: The data above indicate that for some components and for some conditions, "qualified conditions" fall short of predicted conditions, however, qualification is reasonably close to predicted conditions, which adds to the confidence that the equipment will survive. Furthermore, all components exposed to the most severe conditions (i.e. node locations 2 and 17) were shown by the referenced safety evaluation not to present an unacceptable mafety hazard if they were to fail.

LICENSEE RESPONSE TO NRC SER (Continued)

EA-170-302 Inside Containment - Interim Qualification

EA-170-302 limit switches are discussed in EQS's NEB-87-45 and NEB-81-41 for use outside containment. Although these latter EQS's (Revisions 0) are in process, it is evident that the switches are qualified (or perhaps qualified except for relatively minor deviations from NUREG 0588), for use outside containment. That discussion will not be repeated here. Rather, differences between conditions outside and inside the lower containment compartment, where 2-PCV-68-334 and -340A are located, are discussed.

Qualified radiation exposure (2 x '0 rad) exceeds requirements (1 x 10 accident + 2 x 10 normal 40 year rad) for inside containment service. Qualification testing for pressure, and temperature did not cover in-containment conditions, therefore, there is no assurance that they can be qualified. (Test conditions were 1 Atm/200 F versus required 12 psig/327 F.) Chemistry (caustic spray) and humidity may be moot because of the NEMA 4 enclosures provided.

Because potential accident temperature and pressure are significant extrapolations beyond tested conditions, NEB 810609 259 addressed potential failures of these components. It was found that the switches only control the valve position indicating lights in the control room and failure will not affect valve position. Furthermore, alternative qualified monitors will be available to provide accurate information.

Conclusions

The limit switches in Appendix 1 cannot now be qualified per NUREC 0588 and are to be replaced. Interim operation is justified, based on the above information, because:

- a. The equipment is partially qualified, and there is no evidence to show positively that the equipment will not survive long enough to perform its safety function.
- safety analysis for the most questionable components shows that failure would be mitigated by alternative indicators and/or safety equipment,
- c. Margin is provided in predicted accident conditions such that actual conditions would not be as high, and therefore, there is more assurance of proper safety response by these components, and
- d. probability is diminishingly small that a design basis event will occur in the short time when the equipment is to remain in place.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 146

EQUIPMENT ITEM NO. 146

LIMIT SWITCH LOCATED IN THE CONTAINMENT

NAMCO MODEL EA740

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 146

LICENSEE REFERENCE(S): 4755, 5401

FUNCTION (PLANT ID): VALVE POSITION INDICATION (FCV-77-127)

SERVICE: POSITION INDICATION

IICENSEE SUBMITTAL: SCEW(S): EEB-1018 (3.11-4 PAGE 25)

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

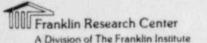
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
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	Ja, 7b, 7c

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SUMM	ARY OF LICENSEE RESPONSES TO THE MRC / R - ONLY CHECKED ITEMS ARE APPLICABL
×	ne Licensee (has/has not) provided a response to the SER concerns.
	The Licensee (has/ 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 tem 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)
- CONTRACTOR - CON	the Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.
-	NATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW
- CII	CLED ITEM ONLY: (See Section 3 of this TER for Legend)
I.b	Qualified II.c Qualified Life Deficiency Modification III.a Exempt
principal party and district	Qualification Not Established III.b Not in Scope
II.b	Not Qualified IV Documentation Not Available



IV

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
	DESIGNATION: = DEFICIENCY
NRC REQUIREMENTS X	
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Establish	hed 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	<u>×</u>
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:
NRC QUALIFICATION CATEGORY	X = CATEGORY
T - Parisment Qualified	
I.a Equipment Qualified I.b Equipment Qualification Pending Modification	
II.a Equipment Qualification Not Established	<u>×</u>
II.b Equipment Qualified	
II.c Equipment Satisfies All Requirements Except Qualified Li	fe
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	

Criteria: DOR Guidelines	; NUREG-0588,	Cat. I; NUREG-0588, Cat	. 11 X.
NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
EQUIPMENT DESCRIPTION		:	!
Equipment Type	LIMIT SWITCH	Limit Switch	
Manufacturer's Name (5.2.2/-/-)	Namco	NAMCO Controls	
Model Number (5.2.2/-/-)	EA740	EA-740 Series	
Serial Number	NOT STATED	EA-740-20000	
Features/Mounting (5.2.6/-/-)	ON VALVE	Horizontal in Autoclave	
Connections/Interfaces (5.2.6/-/-)	NOT STATED	Teflon Tape used to seal conduit threads	X See Note
Location/Elevation	? See page	Not Applicable	
Equipment ID No.) la	Not Applicable	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	No RYMET ID	No Report I/D Number	
Report Date	2/22/79	10/00/00	
Issued by	: Acme Cleveland	2/22/79 (rev 1) ACME CLEVELAND DEVELOPMENT COMPANY	
Prepared for	: NAMCO	NAMCO CONTROLS	
Referenced Reports	NOT STATED	Not Stated	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	TEST	Sequential Test	!
QUALIFICATION TEST PROGRAM Functional Test Description (5.2.5/2.2.9/2.2.9)	N/A	! ! !Make/break contact	
	:		:
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/	NOT STATED	0.5Amps @ 100 Vdc	

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0568-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
Acceptance Criteria			
(5.2.5/2.2.1/2.2.1)	. NOT STATED	Not Stated	
(3.2.3/2.2.1/2.2.1)			1
Accuracy (5.2.5/-/-)	N/A	Not Stated	1
Number of Specimens	. /	One (1)	:
Test Instruments Calibrated	:	Yes	:
Safety Function (Active/	! .		!
Passive) (-/2.1.3/2.1.3)	PASSIVE	Active	:
Test Duration (5.2.1/-/-)		30 days	
Accident Duration (Envir.	1. 5		1
Above Normal) (5.2.1/-/-)	>105 526.	Not Applicable	
Required Function Time	LYEAR	Not Applicable	
Test Sequence (General)			:
(5.2.3/2.3.1/2.3.1)	: NIA	: Inspection/Base line data	1
	!	: Heat/Mumidity Aging	1
Test Sequence (NUREG-0588,	1	Mechanical Aging	
Cat. I) (-/2.3.1/-)	!	! Irradiation	
		Seismic testing	
1. Representative Sample		LOCA SIMULACION	
2. Baseline Data			
3. Performance Extremes 4. Thermal Aging			
5. Radiation Aging	;		
6. Wear Aging	1		
7. Vibration/Seismic	!		:
8. DBE Exposure	!	!	:
9. Post-DBE Exposure	:		:
10. Inspection	:		
Aging	:		i
(5.2.4, 7.0/4.0/4.0)	!	200 1 2000	!
Thermal Aging/Basis	MATERIAL ANALYSIS/TEST	200 hours @ 200°F per ANSI draft std N278.2.1	Note 2
Material Aging	!	:	:
Evaluation (7.0/-/-)	1 755	Not Stated	:
Materials Susceptible	1,40 0		!
(Thermal) (5.2.4, 7.0/-/-)	ETR"O"RING	Not Stated	1
Radiation Aging, Type	: GAMMA	Gamma	1

NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
(DOR/0588-I/0588-II)	1 :		!
Radiation Aging, Dose (rd)	2.0×1074405	204 Megarads	*
Radiation Aging, Dose Rate	5 X 10 4 EMOS/HE!	1.2 Megarads/ hour	:
Radiation Aging, Method	! Test	Test	:
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	NOT STATED	Not Stated	:
Operational Aging (-/4.2/-)	N/A	100,000 Actuation Cycles	!
Other Age Conditioning (-/4.2/-)	N/A	Not Stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	4 years	None Claimed	NOTE 3
Normal Ambient Temperature	: 120° F mat	Not Applicable	:
Normal Ambient Radiation Normal Ambient Humidity	: 5x104 RNOS/HR ! NOT STATED	, nor whiteante	:
Normal Ambient numbercy	: NOT STATED	Not Applicable	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	TVA PLAN	Not Applicable	
On-Going Analysis of Failures and Degradation	N/A	: ! ! var 41411-	
(7.0/-/-)	:	Not Applicable	:
Margin (General) (6.0/3.0/3.0)		Not Stated/ Not Appicable	le.
Margin (NUREG-0588,	i .	Not Stated	
Cat. I) (-/3.2/-)			
 Temperature (+15°F) Pressure (+10%, 	yes	1	1
10 psig max)	; yes	1	:
3. Radiation (not required)	: you	1	
4. Time (+10%, +1 hour	:		1
+ function time minimum)	yes	1	1

^{*} Radiation aging and accident doses were combined in a single Exposure prior to the LOCA Simulation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICINSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	LOCA/MSLB	LOCA/MSLB	
Radiation Type	GAMMA	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	1.0× 108	204 Megarads	*
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	NOT STATED TEST	1.2 Megarads per hour Test	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	NOT STATED	Not Applicable	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)	NOT STATED	Not Stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	1,2 ×108	Not Stated	
Plateout Dose Considered (-/1.48/1.48)	NOT STATED	Not Applicable	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	NOT STATED	Not Applicable	

^{*}Radiation aging and accident doses were combined in a single Exposure prior to the LOCA Simulation.

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NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	DEFICIENCY (X OR
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase)	ll°F/8psi/sec	
Peak: °F/psig/RH/Time		340/115/100/3hrs	:
Decrease To: °F/psig/RH/Time	See page	140/-/-/2h4r 340/105/100/3hrs	
Decrease To: °F/psig/RH/Time	29	320/76/100/2hrs 300/57/100/1hr	
Decrease To: °F/psig/RH/Time)	250/25/100/4days 150/10/100/25 days	!
Equipment Surface Temperature (MSLB) (-/1.2.5.C,	NOT STATED	Not Applicable	:
2.2.6/1.2.5.C, 2.2.6)			:
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	TEST	Test	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	H3 B03/020H	Boric Acid/water/sodium thiosulfate/sodium hydrox ide	x t
Spray Density (gpm/ft ²)	NOT STATED	0.15	
Spray Duration	NOT STATED	30Days	
Submergence Duration (4.1.3/2.2.5/2.2.5)	N/4	Not Applicable	
In-Leakage Considered (5.2.6, 5.3.2/-/-)	N/A	Not Applicable	
Time to Submergence	N/A	Not Applicable	
Dust Environment		Not Applicable	

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NOTES:				
1. Th	report State	2 11	The switch was	mounted
in the cha	amber in a horizon	ntal position	such that the	lever shaft
pointed up	pwards. The switch	ch was attach	ed by means of	a threaded
pipe. Te	flon tape was used	d for sealing	the pipe threa	ds.+
are based on	s made to qualify the the assumption that this connection dur	the user will e	nsure that no stea	rocedures m enters
2. Oh	e report state	4		
_ "Heat	t aging. The heat	t aging test	consisted of ho	lding the -
_unit sus;	pended over water	in a tank at	a temperature	of 200°F —
_for 200 1	hours.+			
(Draft	aging conditions were 3, Rev. 0). The coralified life is not k	relation between nown.	these conditions	and
	censa has also			
estimat	tion of qualified	life haved as	The Dostulated	Slavie
	ature. The fie			ile is in
- (1	ent with The	· · · · · · ·		/
4. The	cersee's submitted	states The de	mies are regu	nel tope
operal	the for 1 year.	The test duris	tion was 30 la	ye. No
analyse	the for 1 year. has been proving	Sel by the O	cerse to establis	& qualification
In this	extended perio	Q.		
The les	insie has not	Dentifued A	re sicessary i	sterface
to mais	tai qualification	- Therefore	This equipment	ten is
assigner	to category Its	. "Qualificat	enot Establish	50".

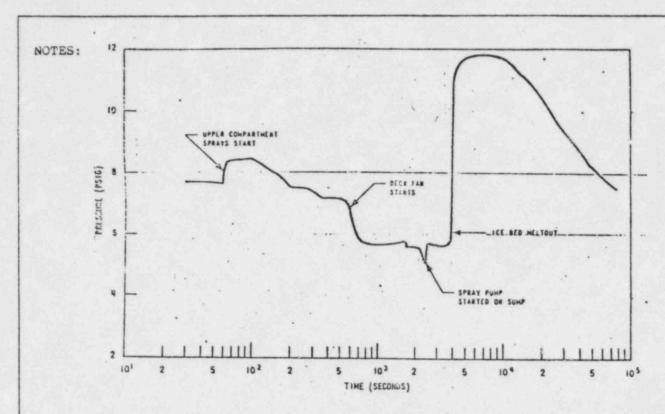


Figure 8.1-1 - Containment Pressure - Double Ended Pump Suction Break

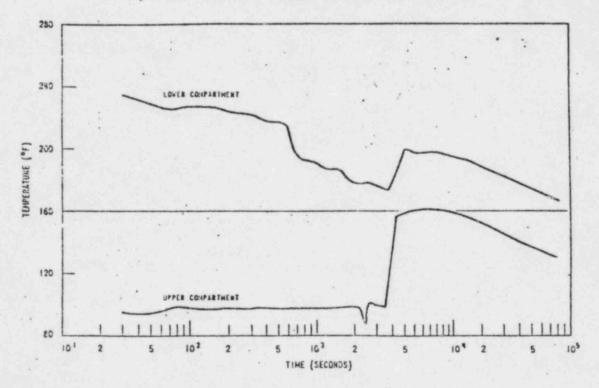
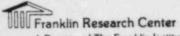


Figure 8.1-2 - Containment Temperature Double Finded Pump Suction Break



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TES:			
NOTE 5. (FCU-77-128 ONLY)			
	The thermal aging analyses presented for this facility have attempted to extrapolate test data obtained from saturated steam tests using the Arrhenius technique to extend qualified duration or calculate qualified life estimates. The assumption used in justifiying this procedure is		
	that the thermal degradation during the environmental test is greater than that accumulated during the postulated accident conditions. What the analyses have failed to recognize is the fact that the Arrhenius		
-	methodology is a theoretical relationship which attempts to predict how reaction rates vary with respect to increases in temperature. This technique is based on the premise that all organic materials degrade to some extent		
PRIMARILY	the presence of oxygen. The saturated steam tests, as a matter of procedure, purge the air from the test chamber prior to the onset of the environmental test. Therefore, the use of saturated steam, or superheated steam for that matter, in conjunction with the Arrhenius technique is not technically		
-	justified. In addition, the Az henius technique does not take into account variations in the reaction rates due to changes in pressure (as would be experienced in a LOCA/MSLB/HELB test), nor does it account for possible		
	anomolies due to the presence of moisture in the chamber atmosphere. The application of the Arrhenius methodology is limited to data obtained from air-oven thermal aging tests (minimum of three tests at different times and temperatures) where the only parameter affecting the reaction rate		
	is temperature. Any application of this technique to thermodynamically different systems must be technically justified with valid analytical procedures.		

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14'

EQUIPMENT ITEM NO. 147

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA740

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 147

LICENSEE REFERENCE(S): 4755, 5401

FUNCTION (PLANT ID): VALVE POSITION INDICATION (FCV-77-128)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1018 (3.11-7 PAGE 25, 3.11-8 PAGE 38)

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	la
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	72, 70, 70

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SUMMARY OF LICENSEE RESPONSES TO THE I	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
X The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment is	ration (has/has not) been provided by the tem.
Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by an Equipment relocation to a Qualification testing of	e @ubmergence level ent from radiation source dditional (testing/analysis) mild environment
The state of the s	er information for this equipment item sis for justification for interim
The Licensee (has/has not) pr	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 147

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM				
NRC REQ	UIREMENTS	DESIGNATION: C = DEFICIENCY		
Adequate Aging D Qualifi Program Criteri Test Du	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Established and Life or Replacement Schedule Established (If Required) Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Required) a Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate a Regarding Spray Satisfied a Regarding Submergence Satisfied a Regarding Radiation Satisfied a Regarding Test Sequence Satisfied a Regarding Test Failures or Severe Anomalies my) Satisfied a Regarding Functional Testing Satisfied a Regarding Instrument Accuracy Satisfied a Regarding Margins Satisfied (NUREG-0588, Cat. I)	×		
I.a I.b II.a II.b II.c	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified L or Replacement Schedule Justified Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review	DESIGNATION: X = CATEGORY X		
III.b	Documentation Not Made Available			

FOR EVALUATION REFER TO ITEM 146

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 148

EQUIPMENT ITEM NO. 148

RADIATION MONITOR LOCATED IN THE AUXILIARY BUILDING

GENERAL ATOMIC, MODEL NOT STATED REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 148

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): EXHAUST MONITOR (RE-90-130, -131)

SERVICE: CONTAINMENT PURGE

LICENSEE SUBMITTAL: SCEW(S): EEB-1003 (TABLES 3.11-8/7 & 3.11-7/17)

FUNCTION (PLANT ID): RADIATION MONITOR (RE-90-102, -103)

SERVICE: FUEL POOL

LICENSEE SUBMITTAL: SCEW(S): EEB-1003 (TABLES 3.11-6/10 & 3.11-8/26)

FUNCTION (PLANT ID): RADIATION MONITOR (RE-90-106, -112)

SERVICE: SCEW(S): NOT STATED

LICENSEE SUBMITTAL: SCEW(S): EEB-1003 (TABLES 3.11-6/10 & 3.11-8/24)

FUNCTION (PLANT ID): LIQUID MONITOR (RE-90-140, -141)

SERVICE: ERCW

FUNCTION (PLANT ID): LIQUID MONITOR (RE-90-133, 134)

SERVICE: ERCW

LICENSEE SUBMITTAL: SCEW(S): EEB-1003 (TABLES 3.11-6/18 & 3.11-8/29)

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, (M), RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

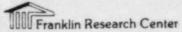
Checksheet Page No. Contents Equipment Item la Summary of Licensee Responses to the NRC SER 16 Equipment Environmental Qualification Summary Forms 3a, 3b, 3c, 3d Licensee Response to NRC SER 4a, 4b, 4c, 4d, 4e, 4£ System Consideration Review Equipment Environmental Qualification Review 5a, 5b, 5c, 5d, 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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	led a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has-not) propositem whose qualification has not	ed a corrective action for this equipment been fully established.
	eration (has/has-not) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment replacement wit	
Equipment relocation abov	
	ent from radiation source
X Verify qualification by a	
Equipment relocation to a	
Qualification testing of Other (equipment in progress
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective.
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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FRC Assignment No. 13
FRC Task No. _519 /526

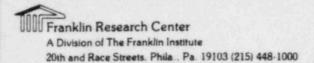
Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. /

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.D Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a III.b Equipment Not in the Scope of the Qualification Review

Documentation Not Made Available

IV



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 148

LICENSEE RESPONSE TO NRC SER

The radiation monitors are required to operate in the following environment:

Temperature:

1340 F

Pressure:

Atmospheric

Relative Humidity: 100%

Radiation:

20 year TID - 8.8 x 103 rads

Accident - 1.0 x 104 rads

The manufacturer's specifications for the radiation monitors are as follows:

Temperature:

140° F

Pressure:

Atmospheric

Relative Humidity: Not Specified

Radiation:

Not Specified

The temperature and pressure environment in which the radiation monitors are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation, additional testing and analysis are being performed by Wyle Laboratories.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 149

EQUIPMENT ITEM NO. 149

PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING CORRIDOR, EL. 690'0"

BAILEY MODEL 556

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 149

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY FW PUMP OUTLET PRESSURE (PT-3-132A) LICENSEE SUBMITTAL: SCEW(S): EEB-1024 (TABLES 3.11-7/18 & 3.11-8/16)

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,

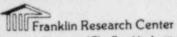
(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
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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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UMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficient	
The Licensee (has/has not) propositem whose qualification has not	ed a corrective action for this equipment been fully established.
★ Justification for interim ope Licensee for this equipment i	ration (has/ has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by a Equipment relocation to a Qualification . The got of Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the consective .)
The Licensee states that the equi	pment item does not require qualification vironmental qualification.
SIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW
	or curs ran for begend,
a Qualified b Modification	II.c Qualified Life Deficiency
THE RESERVE OF THE PARTY OF THE	III.a Exempt
I.a Qualification Not Established	III.b Not in Scope



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 149

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQ	UIREMENTS	DESIGNATION: X = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	ished
Adequati	Adequate Similarity Between Equipment and Test Specimen Establish Aging Degradation Evaluated Adequately	
Aging D	ed life or Penlacement Schedule Established (If Require	d)
Qualiti	Qualified Life or Replacement Schedule Established (If Required) Program Established to Identify Aging Degradation Criteria Regarding Aging Simulation Satisfied (If Required)	
Program		
Criteri	a Regarding Temperature/Pressure Exposure:	
Criteri	a Regarding Temperature Adequate	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	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	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	ia Regarding Instrument Accuracy Satisfied	
Test Du	uration Margin (1 hour + Function Time) Satisfied	
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC OU	ALIFICATION CATEGORY	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.D	Equipment Not in the Scope of the Qualification Review	w
TV	Dogumentation Not Made Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

LICENSEE RESPONSE TO NRC SER

The transmitter is required to operate in the following environment:

Temperature:

1270 F

Pressure:

Atmospheric

Relative Humidity: 30-80% (100% peak)

Radiation:

40 years TID-3.5 x 102 rads Accident - 1 x 104 rads

The manufacturer's specifications for the transmitter are as follows:

Temperature:

180° F

Pressure:

Atmospheric

Relative Humidity: NEMA 4 Enclosure

Not Specified

Radiation:

The temperature and pressure environment in which the transmitter is located is less severe than the manufacturer's specifications. See generic positions

4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace this transmitter with a qualified replacement.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 150

EQUIPMENT ITEM NO. 150

LEVEL SWITCH LOCATED IN THE AUXILIARY BUILDING OPEN AREA, EL. 714'0"

MERCOID MODEL 203G 810C1160

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 150

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): A&B COMPRESSOR TANK B-B LOW LEVEL (LS-313-305)

LICENSEE SUBMITTAL: SCEW(S): MEB 313-042 (TABLES 3.11-6/20 AND 3.11-8/19)

FUNCTION (PLANT ID): A & B DW SUPPLY SHUTOFF (LS-313-340)
LICENSEE SUBMITTAL: SCEW(S): MEB 313-042 (TABLES 3.11-6/20 AND 3.11-8/19)

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

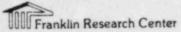
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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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, 7e

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SUMMARY OF LICENSEE RESPONSES TO THE	NFC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when the environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with	h qualified equipment
Equipment relocation above	e submergence level
Relocate or shield equipme	
Verify qualification by a	
Equipment relocation to a	
Qualification testing of other (equipment in progress
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	WITH BUT THE THE THE POST OF T
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. 150

12.

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY	FORM
NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate Adequate Similarity Between Equipment and Test Specimen Est	ablished
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Requ	ired)
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:
NRC QUALIFICATION CATEGORY	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 Qualifi	ed Life
or Replacement Schedule Justified	
III.a Equipment Exempt From Qualification	
III.b Equipment Not in the Scope of the Qualification Rev	riew
IV Documentation Not Made Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. .

150

LICENSEE RESPONSE TO NRC SER

1. These level switches are required to operate in the following environment:

Temperature: 115° F Pressure: Atmos.

Rel Humidity: 100 percent Radiation: 1 by 104

2. The manufact. It is seen that these switches have been subjected to 400°F continue only under full electrical load and operated satisfactorily for hundreds of thousands of cycles.

The switches are encased in a watertight enclosure.

No materials have been identified which would be degraded by the radiation level listed above.

The above information justifies continued operation only. These switches will be replaced with fully qualified units prior to the June 1982 deadline.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 151

EQUIPMENT ITEM NO. 151

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

PENN MODEL A19BAC

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 151

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): FAN INTERLOCK (TS-30-190, 191, 192, 193)

LICENSEE SUBMITTAL: SCEW(S): EEB-1014 (TABLE 3.11-6/2)

FUNCTION (PLANT ID): FAN INTERLOCK (TS-30-175, 176, 177, 178, 179, 180, 182,

183, 186, 187, 196, 197, 201, 202)

LICENSEE SUBMITTAL: SCEW(S): EEB-1014 (TABLE 3.11-7/1)

FUNCTION (PLANT ID): PENETRATION ROOM COOLER A&B (TS-30-194, 195)

LICENSEE SUBMITTAL: SCEW(S): EEB-1014 (TABLE 3.11-8/6)

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

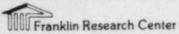
Contents	Checksheet Page No.	
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Summary of Licensee Responses to the NRC SER	1b	
Equipment Environmental Qualification Summary Forms	2	
Licensee Response to NRC SER	3a, 3b, 3c, 3d	
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f	
Equipment Environmental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

Maintenance and Replacement Schedule Summary

7a, 7b, 70

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SUMMARY	OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The	Licensee (has/has not) provided a response to the SER concerns.
qual	Licensee (has/has not) specifically stated that the equipment is ified and/or will function when exposed to the applicable DBE ronmental service conditions.
	Licensee has presented information which shows there are no tanding qualification deficiencies.
	Licensee (has/has not) proposed a corrective action for this equipment whose qualification has not been fully established.
The state of the s	Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
X	Corrective action specified by the Licensee:
-	Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment Qualification testing of equipment in progress X Other (+ ype + test or replace) The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
	The Licensee (mas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action.
	Licensee states that the equipment item does not require qualification or should be exempted from environmental qualification.
	TION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW DITEM ONLY: (See Section 3 of this TER for Legend)
II.a Qua	II.c Qualified Life Deficiency III.a Exempt Lification Not Established III.b Not in Scope Qualified IV Documentation Not Available



II.c

IV

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 151

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.b

Equipment Satisfies All Requirements Except Qualified Life

III.b Equipment Not in the Scope of the Qualification Review

or Replacement Schedule Justified

Documentation Not Made Available

III.a Equipment Exempt From Qualification

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519 /526

Page 3a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15/

LICENSEE RESPONSE TO NRC SER

Although the qualification does not meet all of the requirements of IEEE 323-1971, section 5.3, "Operating Data," operating experience is used to justify their use.

1. The switches are used for HVAC fan interlocks.

The switches are required to operate in the following environment:

Temperature: 121° F
Pressure: Atmospheric
Relative Humidity: 98%
Radiation: 10⁶ rads

The manufacturer's specifications for the switches are as follows (see attachment 1):

Temperature: 140° F, Margin: 19° F

Pressure: Atmospheric

Relative Humidity: General Purpose Enclosure

Radiation: 10⁷ rads

- All environmental specifications are verified by operating experience. Radiation is verified by test.
- 4. The operating conditions to which the switches will be subjected are well within the manufacturer's standard operating conditions. The radiation dose is well within the tested level.
- This model of switch is a standard model from the manufacturer's catalog and has been used in various industries for a number of years.
- The Sequoyah operating environment is well within the manufacturer's standard operating conditions.
- 7. The above information shows justification for continued use of the devices. However, due to lack of sufficient documentation, TVA will either type-test this device or replace it with a type-tested device.

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _____519/536

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 150

EQUIPMENT ITEM NO. 152

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

HONEYWELL MODEL T675A1540

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 152

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): SUPPLY FAN INTAKE TEMPERATURE (TS-30-103A)

SERVICE: AUXILIARY BUILDING VENTILATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1006 (TABLE 3.11-6/2)

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

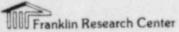
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Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

7a, 7b, 7c

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AMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICAB
The Licensee (has/has) provid	led a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when the environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/hee not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment i	ration (has/ has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment replacement wit	h qualified equipment
Equipment relocation abov	e submergence level
	ent from radiation source
	dditional (testing/analysis)
Equipment relocation to a	
Qualification testing of Other (equipment in progress
	er information for this equipment item sis for justification for interim
X The Licensee (nos/has not) pr	ovided a schedule for the proposed
corrective action. (Bontaule	for accomplishing the corrective
	the state of the s
The Licensce states that the equi	pment item does not require qualification
and/or should be exempted from en	vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
Qualified	II.c Qualified Life Deficiency
Modification	III.a Exempt
a Qualification Not Established	III.b Not in Scope
b Not Qualified	
o Not Qualified	IV Documentation Not Available



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RC REQUIREMENTS	DESIGNATION:
RC REQUIREMENTS	X = DEFICIENCY
	A - DDI TCIDICI
ocumented Evidence of Qualification Adequate dequate Similarity Between Equipment and Test Specimen Estab ging Degradation Evaluated Adequately ualified Life or Replacement Schedule Established (If Requir rogram Established to Identify Aging Degradation riteria Regarding Aging Simulation Satisfied (If Required) riteria 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 riteria Regarding Spray Satisfied riteria Regarding Radiation Satisfied riteria Regarding Test Sequence Satisfied riteria Regarding Test Sequence Satisfied riteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied riteria Regarding Functional Testing Satisfied	lished
Criteria Regarding Instrument Accuracy Satisfied	
est Duration Margin (1 hour + Function Time) Satisfied	
riteria Regarding Margins Satisfied (NUREG-0588, Cat. I) NRC QUALIFICATION CATEGORY	DESIGNATION X = CATEGOR
La Equipment Qualified	X
I.b Equipment Qualification Pending Modification II.a Equipment Qualification Not Established	
II.a Equipment Qualification Not Established II.b Equipment Not Qualified	
II.c Equipment Satisfies All Requirements Except Qualified or Replacement Schedule Justified	Life
III.a Equipment Exempt From Qualification	
III.b Equipment Not in the Scope of the Qualification Review	ew
IV Documentation Not Made Available	

NRC Contract No. NRC-02-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _5791526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO.

LICENSEE RESPONSE TO NRC SER

The switch is required to operate in the following environment:

Temperature:

115°F

Pressure:

Atmospheric

Relative Humidity: T00%

Radiation:

40 year TID - 3.51 x 102 rads

Accident - 1 x 104 rads

The manufacturer's specifications for the switch are as follows:

Temperature:

1250F

Pressure:

Atmospheric

Relative Humidity: Normal Plant Environment

Radiation:

Not Specified

The temperature and pressure environment in which the switch is located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace this switch with a qualified replacement.

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 153

EQUIPMENT ITEM NO. 153

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

FENWAL MODEL 27120-50

REQUIRED OPERATING TIME: 10 MINUTES

TER CHECKSHEET NO. 153

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING STEAM LINE RUPTURE (TS-12-91A, -91B,

-92A, -92B, -99A, -99B)

LICENSEE SUBMITTAL: SCEW(S): EEB-1022 (TABLE 3.11-6/2)

FUNCTION (PLANT ID): AUXILIARY BUILDING STEAM LINE DETECTION (TS-12-96B,

-97A, -97B, -98A, -98B)

LICENSEE SUBMITTAL: SCEW(S): EEB-1022 (TABLES 3.11-6/2 AND 3.11-8/10)

FUNCTION (PLANT ID): AUXILIARY BUILDING STEAM LINE DETECTION (TS-12-94A,

-94B, -95A, -95B, -96A)

LICENSEE SUBMITTAL: SCEW(S): EEB-1022 (TABLES 3.11-6/2 AND 3.11-8/12)

FUNCTION (PLANT ID): AUXILIARY BUILDING STEAM LINE RUPTURE DETECTION

(TS-12-93A, -93B)

LICENSEE SUBMITTAL: SCEW(S): EEB-1022 (TABLES 3.11-6/2 AND 3.11-8/16)

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

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

Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

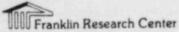
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Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b.

70, 70, 70

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UMN	MARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
x	The Licensee (has/has-net) 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/hes 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 (mas not) provided a schedule for the proposed corrective action. (Secondary the corrective action.
_	The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.
	IGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW IRCLED ITEM ONLY: (See Section 3 of this TER for Legend)
b	Oualified II.c Qualified Life Deficiency III.a Exempt
	Qualification Not Established III.b Not in Scope Not Qualified IV Documentation Not Available



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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FO	DRM
		DESIGNATION: X = DEFICIENCY
NRC REQ	UIREMENTS	A - DEFICIENCE
Occument Adequate Aging D Qualific Program Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Estable egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Require Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Required) a Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate a Regarding Spray Satisfied a Regarding Radiation Satisfied a Regarding Test Sequence Satisfied a Regarding Test Failures or Severe Anomalies any) Satisfied a Regarding Functional Testing Satisfied a Regarding Instrument Accuracy Satisfied	Lished
Test Du	gration Margin (1 hour + Function Time) Satisfied	
	ALIFICATION CATEGORY	DESIGNATION X = CATEGOR
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 Revie	w
	Documentation Not Made Available	
IV	Documentation Not made available	-

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 153

LICENSEE RESPONSE TO NRC SER

The switches are required to operate in the following environment:

Temperature: 1340F Pressure: Atmospheric Relative Humidity: 100%

Radiation: 40 year TID - 1.75x103 rads

Accident - 1.0x104 rads

The manufacturer's specifications for the switches are as follows:

Temperature: 5000F Pressure: Atmospheric

Relative Humidity: Switch is hermetically sealed

Radiation: Not Specified

The temperature and pressure environment in which the switches are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ____5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 154

EQUIPMENT ITEM NO. 154

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

FENWAL MODEL 18003-7

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 154

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING INTAKE TEMPERATURE (TS-30-103)

LICENSEE SUBMITTAL: SCEW(S): EEB-1017 (TABLE 3.11-6/2)

FUNCTION (PLANT ID): AUXILIARY FW PUMP ROOM TEMPERATURE (TS-30-214)

LICENSEE SUBMITTAL: SCEW(S): EEB-1017 (TABLES 3.11-6/17 AND 3.11-8/14)

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:

Maintenance and Replacement Schedule Summary

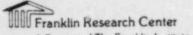
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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
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SUMM	MARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLIC	CABLE
×	The Licensee (has/has not) provided a response to the SER concerns.	
	The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.	
-	The Licensee has presented information which shows there are no outstanding qualification deficiencies.	
X	The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.	ent
	Y Justification for interim operation (has/her not) been provided by the Licensee for this equipment item.	he
	X Corrective action specified by the Licensee:	
	Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analyses) Equipment relocation to a mild environment Qualification testing of equipment in progress Other (The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation. X The Licensee (ase/has not) provided a schedule for the proposed	.)
	corrective action. (Sekadule for accomplishing the corrective	
	The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.	on
	GIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVI	EW
I.b II.a	Qualified II.c Qualified Life Deficiency III.a Exempt a Qualification Not Established b Not Qualified IV Documentation Not Available	



Documentation Not Made Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.p Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 154

LICENSEE RESPONSE TO NRC SER

The switches are required to operate in the following environment:

Temperature: 213°F Pressure: Atmospheric Relative Humidity: 100%

Relative Humidity: 100% Radiation: 40 year TID - 3.51x102 rads

Accident - 1.0x104 rads

The manufacturer's specifications for the switches are as follows:

Temperature: 600°F Pressure: Atmospheric

Relative Humidity: Not Specified

Radiation: Not Specified

The temperature and pressure environment in which the switches are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 155

EQUIPMENT ITEM NO. 155

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING FW PUMP TURBINE ROOM, EL. 669'

FENWAL MODEL 17323-0

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 155

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): HIGH TEMP LINE BREAK DETECTION (TS-1-17A, -17B, -18A,

-18B)

SERVICE: STEAM FLOW TO AFPT ISOLATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1011 (TABLES 3.11-6/17 AND 3.11-8/1)

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

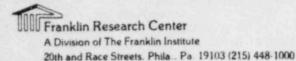
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SUMMARY OF LICENS	SEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee	(has/has not) provided a response to the SER concerns.
qualified and	(has/has not) specifically stated that the equipment is done will function when exposed to the applicable DBE service conditions.
The state of the s	has presented information which shows there are no qualification deficiencies.
The state of the s	(has/has not) proposed a corrective action for this equipment salification has not been fully established.
The state of the s	tion for interim operation (has/har net) been provided by the for this equipment item.
X Correctiv	re action specified by the Licensee:
Equip Equip Reloc Verif Equip	oment replacement with qualified equipment oment modification oment relocation above submergence level cate or shield equipment from radiation source (y qualification by additional (testing/emalysis) oment relocation to a mild environment fication testing of equipment in progress
The Licen	see has provided other information for this equipment item be construed as a basis for justification for interim
- Contraction -	see (nee/has not) provided a schedule for the proposed reaction. (Schedule for assemplishing the assemblies .)
	states that the equipment item does not require qualification be exempted from environmental qualification.
	SULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW ILY: (See Section 3 of this TER for Legend)
I.a Qualified I.b Modification II.a Qualificatio II.b Not Qualifie	n Not Established III.b Not in Scope



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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 155

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS Documented Evilence 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 Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a Equipment Not Qualified II.b Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review Documentation Not Made Available IV

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 155

LICENSEE RESPONSE TO NRC SER

The switches are required to operate in the following environment:

Temperature: 213°F @ 15 sec Pressure: Atmospheric Relative Humidity: 100% Radiation: 40 year TID - 3.51x10² rads

Accident - 1.0x104 rads

The manufacturer's specifications for the switches are as follows:

Temperature: 500°F
Pressure: Atmospheric

Relative Humidity: Not Specified

Radiation: Not Specified

The temperature and pressure environment in which the switches are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. ____5/9 / 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 156

EQUIPMENT ITEM NO. 156

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING INDIVIDUAL COOLER ROOMS, EL. 714'0"

FENWAL MODEL T675A1540

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 156

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PIPE BREAK DETECTION (TS-74-43, -44, -45, -46)

SERVICE: RHR RETURN LINE

LICENSEE SUBMITTAL: SCEW(S): EEB-1013 (TABLES 3.11-7/20 AND 3.11-8/8)

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,

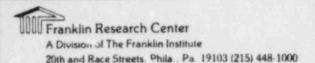
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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System Consideration Review	Aa, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	-6a, 68
Maintenance and Replacement Schedule Summary	7a, 7b, 7e-

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SUMMARY OF LICENSEE RE	SPONSES TO THE NRC SER - O	NLY CHECKED ITEMS ARE APPLICABLE:
Yne Licensee (has/	nes not) provided a respon	se to the SER concerns.
	nas not) specifically stat ill function when exposed ice conditions.	
	resented information which ication deficiencies.	shows there are no
The state of the s	cation has not been fully	tive action for this equipment established.
	for interim operation (has his equipment item.	/has not) been provided by the
X Corrective act	ion specified by the Licen	see:
Equipment of Equip	relocation above submergent shield equipment from rad lification by additional (relocation to a mild environment in testing of equipment in	ce level diation source testing/analysis) onment n progress ion for this equipment item
operation.	has not) provided a sc	
	ion. (Schedule for accomp	
	s that the equipment item compted from environmental	does not require qualification qualification.
	NT NRC QUALIFICATION EVALUATION (See Section 3 of this TER	ATION CATEGORY BASED ON REVIEW for Legend)
I.a Qualified I.b Modification II.a Qualification Not II.b Not Qualified	Established III.b Not	alified Life Deficiency empt t in Scope cumentation Not Available



NRC QUALIFICATION CATEGORY

NRC Contract No. NRC-03-79-118
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FRC Assignment No. 13
FRC Task No. _519/526

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DESIGNATION: X = CATEGORY

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMEN'T ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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)

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.D	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. 156

LICENSEE RESPONSE TO NRC SER

The switches are required to operate in the following environment:

Temperature:

2020F

Pressure:

Atmospheric

Relative Humidty:

100%

Radiation:

2 years TID- 5.0 x 103 rads

Accident - 1.0 x 10

The manufacturer's specifications for the switches are as follows:

Temperature:

125°F

Pressure:

Atmospheric

Relative Humidity: General Purpose Enclosure

Radiation:

Not Specified

The switches are pipe break leak detectors that initiate a lock-in trip function when the area temperature is 115°F. After the switches actuate at 115°F, which is less severe than the manufacturer's specification of 125°F, the lock-in function is complete and any failure after this time would not result in a problem. Therefore, the switches would not be required to operate at the extreme temperature of 202°F. The pressure is within the manufacturer's specification. See generic positions 4.1.8 for relative humidty and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace these switches with a qualified replacement.

NRC Contract No. NRC-63-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _____5/4/5-26

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 157

EQUIPMENT ITEM NO. 157

TEMPERATURE ELEMENTS LOCATED IN THE CONTAINMENT

ROSEMOUNT MODEL 176KS

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 157

LICENSEE REFERENCE(S): 687

FUNCTION (PLANT ID): WIDE RANGE TEMPERATURE (TE-68-1, -18, -24, -41, -43,

-60, -65, -83)

LICENSEE SUBMITTAL: SCEW(S): NEB-68-12 (TABLE 3.11-//13

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

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

LISTING OF APPLICABLE CHECKSHEETS:

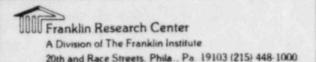
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Equipment Environmental Qualification Summary Fo	orms 2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4t
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI 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. 519 /526

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SUMM	MARY OF LICENSEE RESPONSES TO THE M	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
x	The Licensee (has/has not) provide	ed a response to the SER concerns.
-	The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	en exposed to the applicable DBE
-	The Licensee has presented information outstanding qualification deficient	
×	The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
	Justification for interim open Licensee for this equipment it	ration (has/hac not) been provided by the cem.
	X Corrective action specified by	the Licensee:
	Equipment replacement with	qualified equipment
	Equipment relocation above	e submergence level
	Relocate or shield equipme	ent from radiation source
	Verify qualification by ad	
	Equipment relocation to a	
	Qualification testing of e	equipment in progress
	AND THE RESERVE OF THE PARTY OF	er information for this equipment item sis for justification for interim
	corrective action. (Schedulan	ovided a schedule for the proposed
CHARLES AND ADDRESS OF THE PARTY OF THE PART	The Licensee states that the equipand/or should be exempted from env	ment item does not require qualification ironmental qualification.
DECT	TONAMION OF DECIL MANIE AND OHAL TELCH	MICH PURITURNION CAMPCODY DAGED ON DEUTEN
	IRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.a	Qualified	II.c Qualified Life Deficiency
I.b	Modification	III.a Exempt
	a Qualification Not Established	III.b Not in Scope
II.b	o Not Qualified	IV Documentation Not Available



PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. __519 / 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 157

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 c 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 Equipment Qualified I.a Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a III.b Equipment Not in the Scope of the Qualification Review

Documentation Not Made Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 157

LICENSEE RESPONSE TO NRC SER

Environmental Analysis

These wide-range resistance temperature detectors (RTD's) have been subjected to an environmental test program as described in Westinghouse report WCAP-9157. Subsequently, the NRC staff required major changes in the performance specifications for these RTD's including a modified dose calculation model and a 100-day post-LOCA operation of the wide-range monitors. These changes invalidate the qualification found in WCAP-9157. As part of the conditions for the Sequoyah operating license, the current RTD's must be replaced at each regularly scheduled refueling outage, until they are environmentally qualified or until they are replaced by qualified units. Westinghouse has chosen not to requalify these components, instead TVA will replace them at the first refueling outage with components qualified to IEEE-323-1974.

Justification for Interim Use

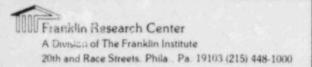
These components are required to withstand one year normal operation and 100 days postaccident. Components designed identical to these RTD's (except for length) were tested in WCAP-9157. The design basis event (DBE) peak temperature is 327°F; these components were tested to a peak of 340°F (reference 1). The DBE peak pressure is 11.7 psig postaccident. Since these RTD's are used in dry containments, they were tested to a peak pressure of 66 psig (reference 2). Relative humidity during the test was 100 percent (reference 5) and chemical spray composition used on the equipment was more severe than actual plant conditions. (1.14 vs 1.13 wt \$ H_BO_3 and 0.17 vs 0.13 wt \$ NaOH) (reference 4).

The test sequence did not include thermal aging. The components were irradiated with 1 x 10 rads (reference 5) prior to environmental testing which is the equivalent of a 1 year accident dose. The testing then simulates an accident profile including postaccident monitoring for 52 days (5 days at 220 F) (reference 6). At the conclusion of the test, there were no failures nor had the accuracy of the components noticeably diminshed.

Because of the satisfactory performance record observed during the above described tests, the units are considered interim qualified for at least 1 year.

References:

- 1. WCAP-9157, figure 6.3
- 2. WCAP-9157, page 5.3
- 3. WCAP-9157, page 5.3
- 4. WCAP-9157, page 5.1
- 5. WCAP-9157, page 2.5
- 6. WCAP-9157, figure 5.3



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 158

EQUIPMENT ITEM NO. 158

HYDROGEN ANALYZER LOCATED IN THE ANNULUS

COMSIP MODEL K-111M

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 158

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): HYDROGEN MONITOR (NOT STATED)

LICENSEE SUBMITTAL: SCEW(S): EEB-1026 (TABLE 3.11-5/2)

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

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

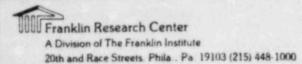
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Item	la
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	Ja, 76, 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has-not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficient	
X The Licensee (has/har not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
	ration (has/ has not) been provided by the tem.
X Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	
Equipment relocation above	submergence level
Relocate or shield equipme	
X Verify qualification by ad	iditional (testing/analysis)
Equipment relocation to a	mild environment
Qualification testing of e	equipment in progress
- Harrison	er information for this equipment item sis for justification for interim
	for accomplishing the corrective.
The Licensee states that the equipand/or should be exempted from env	ment item does not require qualification rironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA - CIRCLED ITEM ONLY: (See Section 3 of	TION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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FRC Assignment No. 13
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 158

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

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 158

LICENSEE RESPONSE TO NRC SER

The Ho monitors are required to operate in the following environment:

Temperature:

150° F

Pressure: ·

Atmospheric

Relative Humidity: 30-80% (100% peak)

Radiation:

40 years TID-5.0 3 105 rads

Accident-4.5 x 100 rads

The H, monitors are qualified to IEEE-323-1971 to the following parameters:

Temperature:

150° F

Pressure:

Atmospheric

Relative Humidity: 100%

Radiation:

1 x 106 RADS (TID)

The temperature, pressure and humidity environment in which the H₂ Monitors are located is not greater than the manufacturer's specifications. The monitors would be exposed to a total radiation dose of 5.0 x 100 rads, which is less than one order of a magnitude above the tested level of 1 x 106 rads. At the tested level there were no failures.

In our engineering judgement the additional radiation above the tested level would not cause a failure. However, due to the lack of documentation we are presently involved with additional radiation testing at Wyle Laboratories to 1.0 x 10 rads.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 159

EQUIPMENT ITEM NO. 159

PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING PIPE GALLERY, EL. 690'0"

FOXBORO MODEL EliGM

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 159

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MAIN STEAM HEADER PRESSURE (PT-1-2A, -27A, -5, -30)

SERVICE: STEAM GENERATOR 1 AND 4

LICENSEE SUBMITTAL: SCEW(S): NEB-1-31 (TABLES 3.11-8/27 AND 3.11-7/17)

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

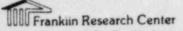
R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	- 5a, 5b, 5a, 5d, 5e, 5f, - 5g, 5h, 5i, 5j.
Installed TMI Lessons Learned Implementation Equipment Summary	ir a, 6b
Maintenance and Replacement Schedule Summary	-7a, 7b, 7c

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	ded a response to the SER converns.
The Licensee (has/has not) specification will function when the environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	eration (has/has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment replacement wit	
Equipment relocation above Relocate or shield equipment	re submergence level ment from radiation source
Verify qualification by a	dditional (testing/analysis)
Equipment relocation to a Qualification testing of Other (
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification	II.c Qualified Life Deficiency 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. 159

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
Documented Evidence of Qualification	Adequate
Adequate Similarity Between Equipment	and Test Specimen Established
Aging Degradation Evaluated Adequatel	. У
Qualified Life or Replacement Schedul	e Established (If Required)
Program Established to Identify Aging	Degradation
Criteria Regarding Aging Simulation S	Satisfied (If Required)
Criteria Regarding Temperature/Pressu	re Exposure:
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Ade	equately
o Steam Exposure (If Required)	Adequate
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satist	fied
Criteria Regarding Radiation Satisfia	ed
Criteria Regarding Test Sequence Sat:	isfied
Criteria Regarding Test Failures or	Severe Anomalies
(If Any) Satisfied	
Criteria Regarding Functional Testing	g Satisfied
Criteria Regarding Instrument Accuracy	cy Satisfied
Test Duration Margin (1 hour + Funct	ion Time) Satisfied
Criteria Regarding Margins Satisfied	(NUREG-0588, Cat. I)
	DESIGNATION:
NRC QUALIFICATION CATEGORY	X = CATEGORY
I.a Equipment Qualified	
I.b Equipment Qualification Pend	ing Modification
II.a Equipment Qualification Not	Established
II.b Equipment Not Qualified	
II.c Equipment Satisfies All Requ	irements Except Qualified Life
or Replacement Schedule Just	
III.a Equipment Exempt From Qualif	
III.b Equipment Not in the Scope o	
IV Documentation Not Made Avail	able

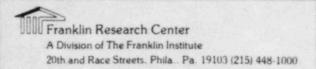
NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _ 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 159

LICENSEE RESPONSE TO NRC SER

- 1. Manufacturer's ambient temperature requirement specified to be 180 F. (Ref. 1)
 - 2. Maximum required operating temperature is 121 F.
 - 3. This operating temperature is much less than manufacturer's specification.
 - 4. These transmitters are located outside containment; they yill have an integrated accident and 40 year life dose of 1.01 x 10 rads. Transmitters physicaly similar to these (Foxboro E13DM) were tested in T2-1075 to a level of 1 x 10 rads. The E11GM measures gauge while the E13DM is a differential measurement. Therefore, the transmitters are believed to be capable of withstanding the accident radiation dose.
 - 5. See generic position 4.1.8 for humidity.
 - 6. Therefore interim operation is justified. The components will be replaced with qualifed instruments by June 1982.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 160

EQUIPMENT ITEM NO. 160

LEVEL TRANSMITTER LOCATED IN THE CONTAINMENT

FOXBORO MODEL E-13DM (MCA)

REQUIRED OPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 160

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): NARROW RANGE STEAM GENERATOR LEVEL (LT-3-148, -156,

-164, -171, -172, -174, -175, -173)

LICENSEE SUBMITTAL: SCEW(S): EEB-1002 (TABLE 3.11-4/7)

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED 17EM(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, Mone,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Equipment Summary

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

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MARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICA
The Licensee (has/has not) provide	ded a response to the SER concerns.
	fically stated that the equipment is nen exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipmen been fully established.
Justification for interim open Licensee for this equipment in	eration (has/has not) been provided by them.
Corrective action specified b	by the Licensee:
Equipment replacement wit	
Equipment relocation above Relocate or shield equipment	re submergence level
Verify qualification by a	additional (testing/analysis)
Equipment relocation to a	mild environment
Qualification testing of Other (equipment in progress
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
	pment item does not require qualification vironmental qualification.
SIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3	CATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
a Qualified	II.c Qualified Life Deficiency
Modification	III.a Exempt
a Qualification Not Established	III.b Not in Scope
.b Not Qualified	IV Documentation Not Available

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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____5/9 /.52 &

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM		
		DESIGNATION:
NRC REQ	UIREMENTS	X = DEFICIENCY
Occument Adequate Aging D Qualific Program Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri Criteri	ted Evidence of Qualification Adequate e Similarity Between Equipment and Test Specimen Establ egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Require Established to Identify Aging Degradation a Regarding Aging Simulation Satisfied (If Required) a Regarding Temperature/Pressure Exposure: Peak Temperature Adequate Peak Pressure Adequate Duration Adequate Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate a Regarding Spray Satisfied a Regarding Submergence Satisfied a Regarding Test Sequence Satisfied a Regarding Test Sequence Satisfied a Regarding Test Failures or Severe Anomalies my) Satisfied a Regarding Functional Testing Satisfied a Regarding Instrument Accuracy Satisfied a Regarding Instrument Accuracy Satisfied a Regarding Margins Satisfied (NUREG-0588, Cat. I)	ished
		DESIGNATION:
NRC QUA	LIFICATION CATEGORY	X = CATEGORY
	Equipment Qualified	
I.a 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	×
TA	pocumentation Not made Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 160

LICENSEE RESPONSE TO NRC SER

1. The transmitters are required to operate in the following environment:

Temperature:

327°F

Pressure:

11.7 PSIG

Relative Humidity:

100%

Radiation:

20 Year TID - 1.0 x-10

Accident - 0.4 x 10

2. The manufacturer's specifications for the transmitters are as follows:

Temperature:

370°F

Pressure:

75 PSIG

Relative Humidity: 100%

Radiation:

1.8 x 107 RADS

- 3. a. Qualification Method. Westinghouse Sensor Qualification Program -IEEE 323-1971 Demonstration Program Reference letter No. NS-PLC-5023 to Mr. Edson Case, Acting Director, Office of Nuclear Reactor Regulation, dated April 26, 1978, for Donald C. Cook, unit 2.
 - b. Transmitters are required for control of auxiliary feedwater control valves. The operability time will be one hour.
 - C. Test. Three Foxboro E13DM (MCA) transmitters were tested in single profile under conditions simulating as accurately as possible the in-containment conditions during postulated accidents. The accuracy required for the transmitters controlling the auxiliary feedwater valves is +25%. This will maintain the water level within the center 50% range of the narrow band sensing tops on the steam generator and will assure adequate operation of the system. The transmitters tested demonstrated a maximum error of +7.09% which occurred during the first 90 seconds of the test while the temperature was at the peak of 370°F. The error decreased as the conditions were reduced. The temperature was monitored by thermocouples located within one inch of the transmitters. The transmitters received pre and post-test calibrations utilizing the SAMA 20.1, 1973 standard. The transmitters receive power from a +2% regulated inverters fed from a qualified 125-volt dc battery. The power supplies are not subjected to hazardous environment.
 - d. The test sequence was radiation followed by steam, chemical spray, temperature, and pressure to simulate as accurately as possible conditions inside containment during postulated accidents. The test procedures comformed to the guidelines described in section 5 of IEEE 323-1971.

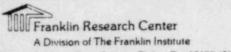
Page 3b

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 160

LICENSEE RESPONSE TO NRC SER (Continued)

- e. Margins. The temperature in the test reached 320°F in approximately 4 seconds and peaked at 370°F in about 9 seconds. Over the next 16 minutes, the temperature was slowly reduced to 320°F. After 20 minutes, the temperature was gradually reduced to 220°F over a period of 24 hours. The chemical spray was terminated at the first 24 hours. The test continued on at the elevated temperature. The 370°F enveloped the Sequoyah maximum temperature of 327°F with ample margin. The test transmitters were subjected to a total integrated dose of 1.8 x 10° rads. For a 20-year life integrated dose plus one hour accident dose, the Sequoyah transmitter will be subjected to 1.4 x 10° rads total integrated dose. This provides a 4 megarad margin. None of the test transmitters experience any change in output due to radiation. The initial failure of the test transmitters occurred at 5.5 days in the elevated temperature environment. This approximates 4 weeks of real time at the expected containment temperatures.
- f. Aging. Material breakdown analysis reveals the presence of non-metallic equipment such as electronic devices and a Viton gasket used as a cover seal. The operability of the electronic devices will be evaluated by calibration and the condition of the Viton gasket will be evaluated by visual inspection and replaced if found to be cracked or worn. This inspection will be at least every refueling outage.
- g. Conclusion. The transmitter errors due to the severe environment plus radiation were well within the ±25% required for the auxiliary feedwater system. The operability time under the elevated temperatures provide a very good margin for the auxiliary feedwater system. Also, the failure of all three transmitters was an open test resistor located in a junction box and exposed to the environment. All three of the transmitters were checked after the test and showed no ill effects. If the test resistors had not opened there is reason to believe the transmitters would have withstood the entire test.

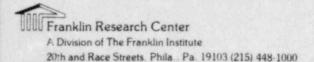
Since the transmitters are only needed to operate for one hour and the test resistors used with the transmitters are not directly exposed to the harsh environment because they are in sealed junction box, it is concluded that the subject transmitters should perform as expected.



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NOTES:
1. The licensee has referenced westinghouse letter
No. NS-PLC-5023 as evidence of equipment
gualification. This document has not been -



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 161

EQUIPMENT ITEM NO. 161

TEMPERATURE ELEMENT LOCATED IN THE CONTAINMENT

ROSEMOUNT MODEL 176KF

REQUIRED OPERATING TIME: 30 SECONDS

TER CHECKSHEET NO. 161

LICENSEE REFERENCE(S): 687

FUNCTION (PLANT ID): NARROW RANGE TEMPERATURE (TE-68-2A, -2B, -14, -25, -37,

-44, -56, -67, -79)

LICENSEE SUBMITTAL: SCEW(S): NEB-68-15 (TABLE 3.11-4/13)

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, TE-68-37,56,67 only
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 5k
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7c-

UMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
The Licensee (has/hes not) provid	led a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided by the tem.
Corrective action specified b	y the Licensee:
Equipment replacement wit Equipment modification Equipment relocation abov Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of Other (e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
_ The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
SIGNATION OF RESULTANT NRC QUALIFIC CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
a Qualified b Modification	II.c Qualified Life Deficiency III.a Exempt
Qualification Not Established Not Qualified	III.b Not in Scope IV Documentation Not Available

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. 519/52-6

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
		DESIGNATION:
NRC REC	UIREMENTS	= DEFICIENCY
	ted Evidence of Qualification Adequate	
Adequat	e Similarity Between Equipment and Test Specimen Establis	hed
	egradation Evaluated Adequately	_X_
Qualifi	ed Life or Replacement Schedule Established (If Required)	_X_
	Established to Identify Aging Degradation	
	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
0	Peak Pressure Adequate	hed X
	Duration Adequate	
	Required Profile Enveloped Adequately	X_
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	_X
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	X
(If A	Any) Satisfied	
	a Regarding Functional Testing Satisfied	_X_
	la Regarding Instrument Accuracy Satisfied	X
	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NDC OU	ALIFICATION CATEGORY	X = CATEGORY
NAC QUA	ALIFICATION CATEGORI	A - CHILDONI
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 Li	Ite Z
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.D	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

LICENSEE RESPONSE TO NRC SER

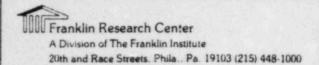
These resistance temperature detectors (RTD's) are qualified by test in WCAP-9157. The three RTD's tested were selected from base-order spares for a group of nuclear power plants.

These narrow-range RTD's are used to develop the short-term reactor trip and safety injection functions. These functions will be performed within the first 30 seconds of the accident and before the ambient temperature reaches 280°F (reference 1). However, as required in NUREG-0588, these components will be qualified by this analysis for 1 hour and 30 seconds of the combined accident envelope (steamline break and loss-of-coolant). The design basis event (DBE) peak temperature is 327°F; these components were tested to a peak of 340°F (reference 2). This includes a margin of 13°F over the DBE peak and a 60°F margin over the highest temperature at which this component is expected to operate. The DBE peak pressure is 11.7 psig. Since these RTD's are also used in dry containments, they were tested to a peak pressure of 66 psig (reference 3) a margin of 560 percent. Relative humidity during the test was 100 percent (reference 4) and the chemical spray used on the equpment was more severe than the actual plant conditions (1.14 vs 1.13 wt \$ H_BO_0 and 0.17 vs 0.13 wt \$ NaOH) (reference 5).

The test sequence did not include thermal aging. The components were irradiated with 1 x 10 rads (reference 6) prior to environmental testing. This is 80 percent more radiation than the component would experience during both 40-year plant normal exposure taken at the reactor coolant pipe outside diameter and 1 day of postaccident exposure. Therefore, all of the environmental conditions simulated in the test were at least as severe and usually more severe than the actual requirements.

The environmental test simulated 1 hour and 30 seconds of the DBE (combined steamline and LOCA). The test temperature increases to 300°F in 10 seconds and peaked at 340°F at 25 seconds. The avergae temperature was 320°F, and this was held for 1,200 seconds, at which point the temperature was decreased linearly to 220°F for 24 hours. This test profile completely envelopes the actual accident profile (reference 7).

The components' testing was continued with 23 hours at an average temperature of 270°F and 5 days at an average temperature of 220°F (reference 7). This additional 5-day and 23-hour postaccident testing an be shown to be equal to 538 days of normal operation (120°F) by using the 10°C rule. At the end of this testing period, no failures had occurred and the accuracy of the components had not noticeably diminshed. Appendix 3 shows the materials used in these RTD's. Several of the materials used have been identified as possibly susceptible to significant degradation at normal operating conditions to thermal aging. In view of the above, it is concluded that these components have a qualified life of 5 years. (One-half the time required to observe significant deterioration.) At the end of this life, these components will be replaced as part of the maintenance and replacement program for Sequoyah Niclear Plant.



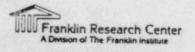
NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 161

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

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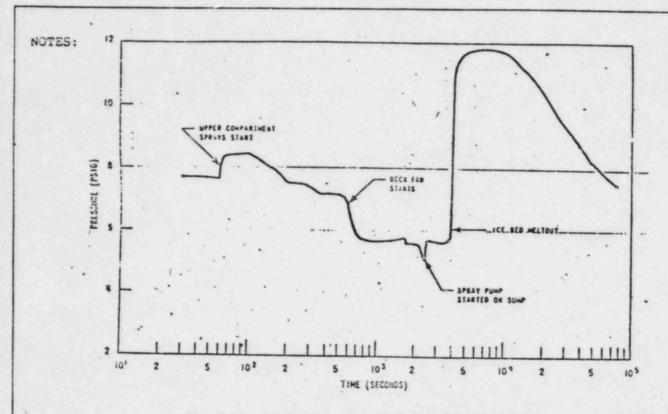


Figure B.1-1 - Containment Pressure - Double Ended Pump Suction Break

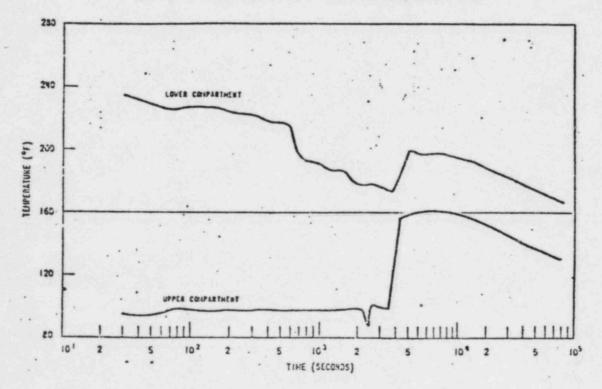


Figure 8.1-2 - Containment Temperature Double Ended Pump Suction Break

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 162

EQUIPMENT ITEM NO. 162

SOLENOID VALUE LOCATED IN THE ANNULUS

VALCOR MODEL V70900-301

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 162

LICENSEE REFERENCE(S): 4760

FUNCTION (PLANT ID): CONTAINMENT VACUUM RELIEF ISOLATION VALVE (FSV-30-46A,

-47A, -48A)

LICENSEE SUBMITTAL: SCEW(S): EEB-1042

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

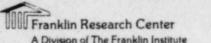
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 40, 4d, 4e, 4£
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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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	ed a response to the SER concerns.
The Licensee (has/has not) specif qualified and/or will function wh environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by the tem.
Corrective action specified b	y the Licensee:
	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW 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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Documentation Not Made Available

IV

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FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION	N SUMMARY FORM
	DESIGNATION:
NRC REQUIREMENTS	X = DEFICIENCY
Documented Evidence of Qualification Adequate	Retablished
Adequate Similarity Between Equipment and Test Spec	
Aging Degradation Evaluated Adequately Qualified Life or Replacement Schedule Established	(If Required)
Program Established to Identify Aging Degradation	(If Required)
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 Anomalie	es
(If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satis	sfied
Criteria Regarding Margins Satisfied (NUREG-0588, G	Cat. I)
	PROTONATON
	DESIGNATION:
NRC QUALIFICATION CATEGORY	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 n Rouinment Not in the Scope of the Qualifica	ation Review

Criteria: DOR Guidelines	· NUBEC 0500	Cat I , NURBO 0500 Cat	¥
Criteria: DOR Guidelines	; NUREG-0500,	cat. 1; NUREG-0500, Cat	. 114.
NRC REQUIREMENTS			DEFICIENCY
WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	(X OR
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	Solenoid Valve	Solenoid Valve	:
Manufacturer's Name	VALCOR	Valcor Engineering	:
(5.2.2/-/-)	! !	varcor Engineering	!
	.V70900-301		: similarity
Model Number (5.2.2/-/-)	1 10700-301	V52600-5291-2	documented by
Serial Number	! !		: manufacturer
Pastures /Noveting			! report
Features/Mounting (5.2.6/-/-)	i :		MR-70900-30
	i :		
Connections/Interfaces	! !		:
(5.2.6/-/-)			
Location/Elevation	Annulus		
Equipment ID No.	: FSV-90-		:
QUALIFICATION REPORT	: 48A :		!
(8.0/5.0/5.0)	100.521 m.515		:
Report ID Number	QR-52600-515	QR-52600-5940-2	
Report Date	MR-76900-301-1	05 1-1 1070	;
	(Pgr 4760)	05-July-1979	:
Issued by	: :	Valcor Engineering Corp.	
Prepared for		Isomedix Inc.	
	:		
Referenced Reports		IFR-V877-01	
Qualification Method	1	Type Test	:
(5.1, 5.3/2.1, 2.4/2.1, 2.4)	:		
QUALIFICATION TEST PROGRAM			:
Functional Test Description	:	Insulation Resistance	!
(5.2.5/2.2.9/2.2.9)		Tests	:
Operating Conditions	:	108 VAC	:
(-/2.2.10/2.2.10)	1	44 psig N ₂	:
Load/Cycles/Voltage/	! !	2	:
Current/Freq.	!		!

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-1/0588-11)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
	!	! Pass Functional Tests,	!
Acceptance Criteria	!	! Demonstrate Satisfactory	1
(5.2.5/2.2.1/2.2.1)	1	! Operability	
Accuracy (5.2.5/-/-)		ND	
Number of Specimens		1	
Test Instruments Calibrated		Yes	
Safety Function (Active/	: Containment		
Passive) (-/2.1.3/2.1.3)	Nacuum		
	relief		
Test Duration (5.2.1/-/-)	isolation valve	: 31 Days	1
Accident Duration (Envir.			:
Above Normal) (5.2.1/-/-)	:		i
Required Function Time	1 year		
Test Sequence (General)			
(5.2.3/2.3.1/2.3.1)	1		
Test Sequence (NUREG-0588,		: TA/OPER/RAD/SEIS/STM+CHSP	
Cat. I) (-/2.3.1/-)		:	:
1. Representative Sample			
2. Baseline Data	!		!
3. Performance Extremes	!	:	:
4. Thermal Aging	1		:
5. Radiation Aging	:		:
6. Wear Aging			
7. Vibration/Seismic			
8. DBE Exposure			
9. Post-DBE Exposure	:		:
10. Inspection	:		
Aging	:	318 deg.F, 172 Hr. To	:
(5.2.4, 7.0/4.0/4.0)		Simulate	!
Thermal Aging/Basis		40 Yrs. @ 120 deg.F	
Material Aging	1	MR52600-515-2	:
Evaluation (7.0/-/-)		Additional 442 Hr.@318°F	
Materials Susceptible	•	to age polyimide to 40 Yr	1
(Thermal) (5.2.4, 7.0/-/-)	:	! Coil Materials	:
		:	
Radiation Aging, Type	•	: GAMMA	

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FRC Task No. 519/526

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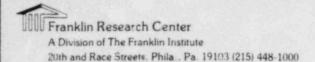
NRC REQUIREMENTS	LICENSEE	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
(DOR/0588-I/0588-II)	SUBMITTAL :	DOCUMENTATION	!
	1		
Radiation Aging, Dose (rd)	2.0x107rd.	50 x 10°	
Radiation Aging, Dose Rate	(40 x. TID)	0.75 Mrd/h	
Radiacion Aging, bose Race		0.75 Md/H	1
Radiation Aging, Method	:	Test	
Materials Susceptible			:
(Radiation) (5.2.4, 7.0/-/-)			
	1		:
Operational Aging		7500 cycles	
(-/4.2/-)		44psig N ₂	
Other Age Conditioning		Seismic Simulation	. :
(-/4.2/-)	:		
Qualified Life Claimed/	:	40 Yr./40 Yr.	
Established (5.2.4/4.10/-)	40yr.+LOCA	40 11./40 11.	:
	:		1
Normal Ambient Temperature	:120°F		
Normal Ambient Radiation	2x107rd(TID)		
Normal Ambient Humidity	98 %		
On-Going Surveillance and			
Preventive Maintenance	1		:
(7.0/-/-)			
On-Going Analysis of			
Failures and Degradation			
(7.0/-/-)	!		
Margin (General)	:		
(6.0/3.0/3.0)			
(0.0, 5.0, 5.0)	!		
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)	:		

NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	DEFICIENCY (X OR
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled	: :		
(4.1, 4.2, 4.3.1, 4.3.3/	!!!		1
1.1, 1.2, 1.5/1.1, 1.2, 1.5)	:		:
Radiation Type	i i	GAMMA	
Radiation Dose (rd)	5.0x107-d.	150 x 10 ⁶	
(4.1.2/1.4/1.4)			
Radiation Dose Rate (rd/hr)	inot stated !	0.75×10^6 , Test	
Radiation Qual. Method	! !		:
(5.3.1/-/-)	: :		:
Provimity to Concentrated	i i		
Radiation	! !		1
(4.1.2/1.4.6/1.4.6)	: :		:
Equipment Susceptible to	: :		
Seta Radiation (4.1.2/-/-)	!!!		
Radiation Dose (Normal +	7.0×107rd	200 x 10 ⁶ rad	
Accident) (4.1.2/-/-)	ייסאוט רם	200 x 10 1au	i
Plateout Dose Considered		NA	
(-/1.48/1.48)	: i	MA	
Gamma + Beta Dose (rd)		N/A	
(4.1.2/1.4.7/1.4.7)		NA	

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase		Not Stated But Within 3 - 5 Min.	
Peak: °F/psig/RH/Time	Peak 150°F	346/113/100/3h	
Decrease To: °F/psig/RH/Time	12,4 psi &	335/113/100/3h	
Decrease To: °F/psig/RH/Time	100% rh	315/69/100/4h	
Decrease To: °F/psig/RH/Time		272/28/100/4h	
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)		245/13/100/27.5d	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	NA	Test (Simultaneous)	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	NA	2200 ppm Boron H3B03 0.064m Na ₂ S ₂ O ₃ NaOH, ph=10	5
Spray Density (gpm/ft ²)	NA	0.15 gpm/ft ²	
Spray Duration		44,640 min.	
Submergence Duration (4.1.3/2.2.5/2.2.5)			
In-Leakage Considered (5.2.6, 5.3.2/-/-)			
Time to Submergence			
Dust Environment			:

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-	It was determined by analysis that polyimide would require additional
	thermal aging of 442 hr. @ 318°F to simulate 40 yrs @ 120°F. All other
	coil materials were subsequently overaged during the additional thermal
	aging.
_	
-	
_	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 163

EQUIPMENT ITEM NO. 163

POWER SUPPLY LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE, MODEL NOT STATED REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 163

LICENSEE REFERENCE(S): 1572, 1573, 1574, 1575, 1576, 1577, 1578
FUNCTION (PLANT ID): HYDROGEN RECOMBINER POWER SUPPLY (NOT STATED)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-36 (TABLE 3.11-6/20)

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	la
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, 70

JMM/	ARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICAB
١ ١	The Licensee (has/has not) provided a response to the SER concerns.
9	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 tem whose qualification has not been fully established.
	Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
	Corrective action specified by the Licensee:
	Equipment replacement with qualified equipment Equipment modification
	Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis)
	Equipment relocation to a mild environment
	Qualification testing of equipment in progress Other ()
	The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
	The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action)
-	The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.
-	GNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW CLED ITEM ONLY: (See Section 3 of this TER for Legend)
	Qualified Life Deficiency
	Modification III.a Exempt
	Qualification Not Established [III.b Not in Scope]
h	Not Qualified IV Documentation Not Available

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
		DESIGNATION:
NRC REQ	UTREMENTS 2	= DEFICIENCY
Document Adequate Aging Document Adequate Aging Document Culteris Criteris	ted Evidence of Qualification Adequate te Similarity Between Equipment and Test Specimen Established (and Es	shed
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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 L	
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	X
IV	Documentation Not Made Available	

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 163

LICENSEE RESPONSE TO NRC SER

NEB-XX -36 Assendix 1

H, Recombiner Power Supply Cabinet A-A and B-B

These are the power supply cabinets made by Westinghouse which provide power to the Electric Recombiner. No motal number was listed in the 3.11 tables or on the EQS cover sheet because Westinghouse did not assign a model number to these components. However, power supply cabinet A-A is identical to 8-B and both are identical to those tested by Wastinghouse. (See WCAP 7709 L).

Requirements

The power supply cabinets were designed for a 40 year life in as

110°F ambient - not operating 70-90°F ambient - operating 14.7 ± .05 psia ambient 0-100% relative humidity 103 rads radiation case rads radiation case (r-51 & 2)

The accident environment these power supply cabinets may see is:

16 F peak temperature (LOCA on a hot day) Atmospheriq pressure 1.0 x 10 rads (accident and 40 year life) 100% maximum peak humidity (normal maximum 80%)

Required operating time is 7 year post-LOCA. However, after approximately 30 days of continuous use, these components would be used only intermittently (at most 50% of the time) to recombine the H₂ evolved by the corrosion of metal by caustic spray. Even in the worst accident, the recombiners would not need to operate until at least 24 hours post LOCA. Generally, the recombiners would not be started until the 9 days post-LOCA. This demonstrates the great started until the 9 days post-LOC1. flexibility available in using the recombiners.

The Power Supply Cabinets have been tested to 135°F ambient for 10 days of continuous use. (Ref. 3). At the end of this test there was no detectable adverse effect. This is 20°F greater than the maximum expected temperature. Using the 10°C rule, this 10 day testing is the equivalent of 21 continuous use at the maximum temperature. However, the maximum temperature (115°F) occurs only during a LOCA on a 97°F day. The normal range of temperatures in the auxiliary building are 60°-110°F. Assuming an average temperatures of 30°F and using the 10°C rule, the 10 day test at elevated temperature would equal 83 days of continuous use at the average 80 tomperature.

- 1. Table 1-1 Elective Hydrogen Recombiner Technical Manual.
- 2. WCAP-7709-L Supplement 5 page 8-1.
- 3. WCAP-7709-L Supplement 3.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 163

LICENSEE RESPONSE TO NRC SER (Continued)

In separate testing a different power supply sasinet was open that continuously for 50 days in a normal ambient environment. (Ref. 3)

In heither test, the power supply cabinets were not irradiated prior to testing. However, all materials were evaluated (ref 4 5 5) and there are mone which are susceptible to aging at the low level of radiation defined in the requirements.

. Conclusion

These components are considered qualified for a 40 year life for the following reasons:

a. The tests and discussion above demonstrate the operability of these power supply cabinets for 3 months postaccident. (50 days demonstrated continuous use equals 30 days of continuous use plus 60 days of intermittent (50%) use.) The power supply, while needed for 1 year is used only intermittently, and is accessible for maintaince and servicing postaccident. Each recombiner has its own power supply cabinet. The recombiners are independent and redundant such that even were one out of service for maintenance, there would be a second unit upon which to rely.

Therefore, at any time after the 98 days demonstrated, if the power supply exhibits degraded performance it can be serviced.

b. Ouring non-accident conditions, the power suply cabinets are de-energized. They are serviced every six months, and are completely re-calibrated every 18 months. Additionally, the effects of aging from the normal environment for these components can be observed by the testing required by the tech specs. The tech spec requires a performance capability which implies a minimum of degracation and, therefore a substantial remaining service life. (Faf. 6)

3. WCAP-7709-L Supplement 3.

 Figure 1-6 Bill of Materials for Power Supply, Elective Hydrogen Recombiner Technical Manual.

 Verbal communications with Marie Hartrath of Westinghouse, August 19, 1981.

6. SQN Unit 1 Technical Specification, Unit 1, p3/4-6-25

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 163

SYSTEM CONSIDERATION REVIEW

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

Reason for Concurrence

- Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- Backup (equipment/system) is subject to a potentially disabling single active failure.
- ____ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 164

EQUIPMENT ITEM NO. 164

PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING PIPE GALLERY, EL. 690'

FOXBORO MODEL EllGM (MCA)

REQUIRED OPERATING TIME: 10 MINUTES

TER CHECKSHEET NO. 164

LICENSEE REFERENCE(S): 919

FUNCTION (PLANT ID): STEAM HEADER PRESSURE (PT-1-2B, -27B)

SERVICE: STEAM GENERATOR 1 AND 4

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-33 (TABLES 3.11-8/3 AND 3.11-7-17)

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:

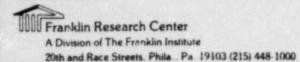
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 51, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

72, 7b, 7c

Maintenance and Replacement Schedule Summary

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UMN	MARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X	The Licensee (has/has not) provided a response to the SER concerns.
۷	The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
-	The Licensee has presented information which shows there are no outstanding qualification deficiencies.
	The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
	Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
	Corrective action specified by the Licensee:
	Equipment replacement with qualified equipment Equipment modification
	Equipment relocation above submergence level Relocate or shield equipment from radiation source
	Verify qualification by additional (testing/analysis)
	Equipment relocation to a mild environment
	Qualification testing of equipment in progress Other ()
	The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
	The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action)
-	The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.
SI	GNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED IN REVIEW
_	RCLED ITEM ONLY: (See Section 3 of this TER for Legend)
2	Qualified II.c Qualified Life Deficiency
	Modification III.a Exempt
COMMON	Qualification Not Established III.b Not in Scope
.b	Not Qualified IV Documentation Not Available



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 164

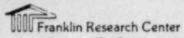
EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQ		DESIGNATION: = DEFICIENCY
Documen	ted Evidence of Qualification Adequate	
	e Similarity Between Equipment and Test Specimen Establis	hed
	egradation Evaluated Adequately	×
Qualifi	ed Life or Replacement Schedule Established (If Required)	X
Program	Established to Identify Aging Degradation	×
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	_ X
	Peak Pressure Adequate	X
	Duration Adequate	×
	Required Profile Enveloped Adequately	X
	Steam Exposure (If Required) Adequate	_X
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	X
	a Regarding Test Sequence Satisfied	X
	a Regarding Test Failures or Severe Anomalies	
	any) Satisfied	
	a Regarding Functional Testing Satisfied	
	a Regarding Instrument Accuracy Satisfied	X
	ration Margin (1 hour + Function Time) Satisfied	_X_
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	$\overline{\mathbf{x}}$
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Li	fe
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
TV	Documentation Not Made Available	

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Criteria: DOR Guidelines X	; NUREG-0588,	Cat. I; NUREG-0588, Ca	t. 11
NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION Equipment Type	! !Pressure !Transmitter	Differential and Guage Pressure Transmitter	
Manufacturer's Name (5.2.2/-/-)	Foxboro	Foxboro	į
Model Number (5.2.2/-/-)	EIIGM (MCA)	E 10 Series (See Note Pages	<i>(</i>)
Serial Number	Not stated		
Features/Mounting (5.2.6/-/-)			-
Connections/Interfaces (5.2.6/-/-)			
Location/Elevation	See P. la	N/A N/A	
Equipment ID No.	: 1	, M.	:
QUALIFICATION REPORT			
(8.0/5.0/5.0)	1 7 1017	T 3-1013	[919]
Report ID Number	!T3-1013	T 3-1013 May 1975	
Report Date	:	May 11 Fmathin	:
Issued by	Foxboro	Forbero (Reformed by Franklin Institute Resarch	
Prepared for	:	Foxbro	
Referenced Reports		None	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)		Tes+	
QUALIFICATION TEST PROGRAM Functional Test Description (5.2.5/2.2.9/2.2.9)		Monitoring and Calibration	
Operating Conditions		Not Stated.	
(-/2.2.10/2.2.10)	1		! -
Load/Cycles/Voltage/			!



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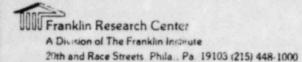
NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
		Ability to come without	
Acceptance Criteria		loss of function when submitted	
(5.2.5/2.2.1/2.2.1)		to MCA	
Accuracy (5.2.5/-/-)	: 5% reg'd	Not stated	X
Number of Specimens	i	ц	
Test Instruments Calibrated		Not stated	
Safety Function (Active/		Active	
Passive) (-/2.1.3/2.1.3)			
Test Duration (5.2.1/-/-)	,	zyhorrs	
Accident Duration (Envir.			
Above Normal) (5.2.1/-/-)	unknown	Edvens	×
Required Function Time	10 minutes		
Test Sequence (General)		Only MCA Exposure per-	×
(5.2.3/2.3.1/2.3.1)	!	formed with pretestand post-test calibration with	
mank Carrier AWARD 0500		post-test calibration with	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)		monitoring during test.	
1. Representative Sample			
2. Baseline Data	1		:
3. Performance Extremes			
4. Thermal Aging			
5. Radiation Aging	:		
6. Wear Aging 7. Vibration/Seismic	•		
8. DBE Exposure			
9. Post-DBE Exposure			!
10. Inspection	:		
	! No+	Not performed	
Aging	100+	in per	X
(5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	Addressed		
Material Aging	:		
Evaluation (7.0/-/-)			
Materials Susceptible	:		:
(Thermal) (5.2.4, 7.0/-/-;		Not performed	
Radiation Aging, Type		Not performed	

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NRC REQUIREMENTS ITH SECTION REFERENCE	LICENSEE	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
	SUBMITTAL	Not stated Not performed None Not stated	(X OR



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NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	DEFICIENCY (X OR
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled		LOCA (MCA)	
(4.1, 4.2, 4.3.1, 4.3.3/	: !		!
1.1, 1.2, 1.5/1.1, 1.2, 1.5)	: :	Not performed.	:
	! !	11 performed	: ×
Radiation Type		Not per torm	FT !
Radiation Dose (rd)			1000
(4.1.2/1.4/1.4)			
(1111)			
Radiation Dose Rate (rd/hr)			
Radiation Qual. Method			
(5.3.1/-/-)	: :		1
Province to Consultated			
Proximity to Concentrated Radiation			
(4.1.2/1.4.6/1.4.6)			
(11112) 11110) 11110)			
Equipment Susceptible to			
Bata Radiation (4.1.2/-/-)			
	Not stated:		1
Accident) (4.1.2/-/-)			
Plateout Dose Considered			
(-/1.48/1.48)			
Gamma + Beta Dose (rd)			
(4.1.2/1.4.7/1.4.7)			1

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FRC Task No. _5/9/526____

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NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	DEFICIENCY (X OR
(DCR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase	Not supplied	6.3°F/ 1.7 psig/Seconds	×
Peak: °F/psig/RH/Time		300/60 /100/2 hours 244/20/100/22hours	
Decrease To: °F/psig/RH/Time		244/20/100/22200011 Ambient	
Decrease To: °F/psig/RH/Time		Ambien1	!
Decrease To: °F/psig/RH/Time			!
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C,		Not stated	
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	Test	
Spray Composition		1.5% Boric Acid by Weight NaOH to adjust pH to 9.25-10	
(4.1.4/1.3, 2.2.8/		NaOH to adjust ph to 7. 25 10	
1.3, 2.2.8)			!
Spray Density (gpm/ft ²)		2 hours @ pH of 9.5-19 22 hours @ pH of 8.5	
Spray Duration		22 hours @ PH of 8.3	i
Submergence Duration			:
(4.1.3/2.2.5/2.2.5)			:
In-Leakage Considered			;
(5.2.6, 5.3.2/-/-)			:
Time to Submergence			
Oust Environment			
(-/2.2.11/2.2.11)	Ψ :		!

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 169

NOTES:

Note 1:

EllGH-IIMM2 Electronic Gauge Pressure Transmitter

S/N 2692435, 2713116, Style B
Calibrated Input Range: 0-2000 lbf/in²
Output: 4-20 mA dc
Supply Voltage: 30 V dc
Output Load: 6500
Construction and Modifications:
MCA/Cast Iron - Base & Cover
MCA/RR: - Radiation Resistant Wiring
Paint - Americalt # 66
Amplifier - N0146ND

EllGM-ISAE-2 Electronic Gauge Pressure Transmitter

S/N 2692434, 2713115, Style B
Calibrated Input Range: 0-1000 lbf/in²
Output: 4-20 mA dc
Supply Voltage: 30 V dc
Output Load: 6500
Construction and Modifications:
 MCA/Cast Iron - Base & Cover
 MCA/RRW - Radiation Resistant Wiring
 Paint - Americant # 66
Amplifier - N0148ND

El3DH-ISAM2 Electronic d/p Transmitter

S/N 9892441, 42, Style B
Calibrated Input Range: 0-100"H20
Output: 4-20 mA dc
Supply Voltage: 30 V dc
Output Load: 6500
Construction and Modifications:
MCA/Cast Iron - Base & Cover
MCA/RRW - Radiation Resistant Wiring
Paint - Americant # 66
Capsule Fill - DC 710
Amplifier - N0148NL

E130 - ISAM2 Electronic d/s Transmitter

S/N 2692438, 39, Style B
Calibrated Input Range: 0-100"H₂0
Output: 4-20 mA dc
Supply Voltage: 30 V dc
Output Load: 6500
Construction and Modifications:
 MCA/Cast Iron - Base & Cover
 MCA/RRW - Radiation Resistant Wiring
 Paint - Americant # 66
 Capsule Fill - DC 710
 Amplifier - N0148ND

Revision - Addition of Style designation, May. 1975.

3-XJB-I/25 MCA Cast Iron Junction Box Assembly & Pressure Seal Assembly Construction:

Terminal Block - NO148PQ Pressure Seal Assembly - NO148PF

NRC Contract No. NRC-03-79-118
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FRC Task No. 5/9/526

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NOTES:
2. The licensee has not supplied the temper-
ature / pressure profile or accident duration
for this location. Aging, radiation, and accuracy
have not been addressed.
The second second additional second s
경기 있다면서 모양하게 하다 할아내면 되었다면서 가장 보다는 보다 되었다.

NRC Contract No. NRC-03-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 165

EQUIPMENT ITEM NO. 165

PRESSURE TRANSMITTER LOCATED IN THE EAST VALVE ROOM

FOXBORO MODEL EllGM (MCA)

REQUIRED OPERATING TIME: 10 MINUTES

TER CHECKSHEET NO. 165

LICENSEE REFERENCE(S): 919

FUNCTION (PLANT ID): MAIN STEAM HEADER PRESSURE (PT-1-9A, -9B, -20A, -20B,

-12, -23)

SERVICE: STEAM GENERATOR 1 AND 4

LICENSEE SUBMITTAL: SCEW(S): NEB-1-32 (TABLES 3.11-8/4 AND 3.11-6/19)

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

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

Not stated, Not applicable

Contante

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

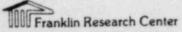
Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NFC SER	3a, 3b, 3c, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c,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

Chackshoot Dage No

7a, 7b, 70

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	en exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment in	ration (has/has act) been provided by the tem.
Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ac Equipment relocation to a Qualification testing of e	e submergence level ent from radiation source dditional (testing/analysis) mild environment
The Licensee has provided other that can be construed as a base operation. The Licensee (has/has not) procorrective action. (Schedule	er information for this equipment item sis for justification for interim
The Licensee states that the equipand/or should be exempted from environment	oment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	or this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 NRC Contract No. NRC-03-79-113
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FOR	<u>IM</u>			
NDC DEC	UIREMENTS	DESIGNATION: X = DEFICIENCY			
NRC REQ	OTREMENTS				
ocumen	ted Evidence of Qualification Adequate				
dequat	e Similarity Between Equipment and Test Specimen Establi	i) × × × ×			
ging D	egradation Evaluated Adequately	<u>×</u>			
Qualifi	ed Life or Replacement Schedule Established (If Required	1)			
Program	Established to Identify Aging Degradation	<u>X</u>			
Criteri	a Regarding Aging Simulation Satisfied (If Required)				
	a Regarding Temperature/Pressure Exposure:				
	Peak Temperature Adequate				
	Peak Pressure Adequate	=			
	Duration Adequate				
0	Required Profile Enveloped Adequately				
0	Steam Exposure (If Required) Adequate	-			
Criteri	a Regarding Spray Satisfied	-			
Criteri	a Regarding Submergence Satisfied				
Criteri	a Regarding Radiation Satisfied				
Criteri	riteria Regarding Test Sequence Satisfied				
	a Regarding Test Failures or Severe Anomalies	<u></u>			
(If)	any) Satisfied				
	a Regarding Functional Testing Satisfied	~			
Criter	a Regarding Instrument Accuracy Satisfied				
Test Du	uration Margin (1 hour + Function Time) Satisfied				
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)				
		DESIGNATION:			
NRC QUA	ALIFICATION CATEGORY	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 or Replacement Schedule Justified	Life			
III.a	Equipment Exempt From Qualification				
III.a	Equipment Not in the Scope of the Qualification Review				
IV.B	Documentation Not Made Available				

NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 519 /526

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Criteria: DOR Guide ines X	; NUREG-0588,	Cat. I ; NUREG-0588, Ca	t. II .
NRC REQUIREMENTS WITH SECTION REFERENCE	LICENSEE	QUALIFICATION	DEFICIENC (X OR
(DOR/0588-I/0588-II)	SUBMITTAL	DOCUMENTATION	NOTE NO.
PANIT DUENT DESCRIPTION			:
EQUIPMENT DESCRIPTION Equipment Type	!Pressure !Transmitter	Differential and Guage Pressure Transmitter	
Manufacturer's Name (5.2.2/-/-)	Foxboro	Foxboro	
Model Number (5.2.2/-/-)	EIIGM	E 10 Series (See Note Payes	o)
Serial Number	(MCA) Not stated		
Features/Mounting	:		
(5.2.6/-/-)	:		
Connections/Interfaces			:
(5.2.6/-/-)	: 1		
Location/Elevation	See P. la	N/A N/A	
Equipment ID No.	: 1	No.	!
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	:T3-1013	T 3-10/3	[616]
Report Date		Mey 1975	;
Issued by	Foxboro	Foxboro (Performed by Franklin Institute Resarch	
Prepared for		Foxboro .	
Referenced Reports		None	
Qualification Method		-1	
(5.1, 5.3/2.1, 2.4/2.1, 2.4)		Test	
DUALIFICATION TEST PROGRAM		Monitoring and Calibration	
'unctional Test Description (5.2.5/2.2.5/2.2.9)		Monitoring and Califarata	
perating Conditions		Not Stated.	
-/2.2.10/2.2.10)		1	:
Load/Cycles/Voltage/ Current/Freq.	:		

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20th and Race Streets Phila Pa 19103 (215) 448-1000

NRC Contract No. NRC-03-79-118
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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-1/0588-11)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	(X OR NOTE NO.)
Acceptance Criteria		Ability to operate without loss of function when submitted	!
Acceptance Criteria (5.2.5/2.2.1/2.2.1)		· lose of function when submitted	
(3.2.3/2.2.1/2.2.1)		+ to MCA	
Accuracy (5.2.5/-/-)	: 5% reg'd		X
Number of Specimens		. 4	
Test Instruments Calibrated		Not stated	
Safety Function (Active/		Active	
Passive) (-/2.1.3/2.1.3)			
Test Duration (5.2.1/-/-)	i	zyhoers	
Accident Duration (Engir.		! eyhours	
Above Normal) (5.2.1/-/-)	24 hours	i Edhours	
Required Function Time	10 minutes	-	
Test Sequence (General)		Oals MCA Exposure per-	×
(5.2.3/2.3.1/2.3.1)	!	formed with pretestand post-test calibration with	
Most Secure Owner of the		post-test calibration with	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)		monitoring during test.	
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	:No+	Not performed	
(5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	Addressed		X
Material Aging	•		
Materials Susceptible	:		
(Thermal) (5.2.4, 7.0/-/-;	:	Not performed	
Radiation Aging, Type	:	Not pertormen	

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd) Radiation Aging, Dose Rate Radiation Aging, Method Materials Susceptible (Radiation) (5.2.4, 7.0/-/-) Operational Aging (-/4.2/-) Other Age Conditioning (-/4.2/-) Qualified Life Claimed/ Established (5.2.4/4.10/-) 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/-/-)	Not Addressed	Not stated Not performed None Not stated Not stated	X
Margin (General) (6.0/3.0/3.0) Margin (NUREG-0588, Cat. I) (-/3.2/-) 1. Temperature (+15°F) 2. Pressure (+10%,		H/A	

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FRC Assignment No. 13
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NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO. /
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)		LOCA (MCA)	
Radiation Type	İ	Not performed	×
Radiation Dose (rd) (4.1.2/1.4/1.4)			•
Radiation Some 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/-/-)	Not Stated		
Plateout Dose Considered (-/1.48/1.48)			
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)			

5e

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE	QUALIFICATION	OEFICIE: (X OR
(DON/ 0303-1/ 0330-11)	SUBMITTAL :	DOCUMENTATION :	NOTE No.
ENVIRONMENTAL PROFILE			:
OF ACCIDENT CONDITIONS			1
Rate of Temp./Press.	See profile	: 6.3°F/ 1.7psig/Seconds	
Increase	page 5h		
	!	300/60 /100/2 hours 244/20/100/22hours	1
Peak: °F/psig/RH/Time	:	300/60 //00/2 /00	
Decrease To: °F/psig/RH/Time		: 244/20/100/22hours	
	:	Ambient	i
Decrease To: °F/psig/RH/Time		: Ambien	:
Decrease To: °F/psig/RH/Time	: \		
Equipment Surface Tempera-	:	Not stated	:
ture (MSLB) (-/1.2.5.C,			!
2.2.6/1.2.5.0, 2.2.6)			:
Spray Qualification Method	: NIA	: Test	:
(5.3.2/1.3, 2.2.8/1.3,	!		!
2.2.8)		! . I woisht	
Spray Composition	i.	1.5% Boric Acid by Weight NaOH to adjust pH to 9.25-10	
(4.1.4/1.3, 2.2.8/	:	: NaOH to adjust ph to her	:
1.3, 2.2.8)			
Spray Density (gpm/ft ²)		4 pHof 9.5-19	
Spray Duration		2 hours @ pH of 9.5-12 22 hours @ pH of 8.5	
Submergence Duration			
(4.2.3/2.2.5/6.5.5)	:		
In-Leakage Considered			
(5.2.6, 5.3.2/-/-)			
			!
Time to Submergence			
Dust Environsen			

2000 EP

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 165

NUTES:

Note 1:

Ellow-Ilhua Electronic Gaugo Pressure Transmitter

S/N 2592435, 2713116, Style B Calibrated Input Range: 0-2000 lbf/in² Cutput: 4-20 mA dc Supply Voltage: 30 V dc Output Load: 650a Construction and Modifications: MCA/Cast Iron - Base & Cover MCA/RRW - Radiation Resistant Wiring Paint - Americoat # 66 Amplifier - NO148HD

EllGM-ISAE-2 Electronic Gauge Pressure Transmitter

S/N 2692434, 2713115, Style B Calibrated Input Range: 0-1000 16f/in2 Output: 4-20 mA do Supply Voltage: 30 V dc Output Load: 650n Construction and Modifications: DA/Dast Iron - Base & Cover Paint - Americoat # 66 Amplifier - NO148ND

E13DH-ISAM2 Electronic d/p Transmitter

S/N 2692441, 42, Style B Calibrated Input Range: 0-100"H20 Cutput: 4-20 mA dc Supply Voltage: 30 V da Output Load: 650n MCA/RRW - Radiation Resistant Wiring Paint - Americoat # 66 Capsule Fill - DC 710 implifier - NO148NL

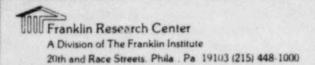
Thirty-Index Sinctronic d/n Transmitten

C/M 2392433, 39, Style B Calibrated Input Range: 0-100"H20 Output: 4-20 mA dc Supply Voltage: 30 V dc Output Load: 6500 Construction and Modifications: ort Iron - Dace & Cover - Design of Poststant Wining

Revision - Addition of Style designation, May, 1975.

3-XJS-1/25 MCA Cast Iron Junction Box Assembly & Pressure Seal Assembly Construction:

> Terminal Block - 80148PO ressure Seal Assembly - Noizepr

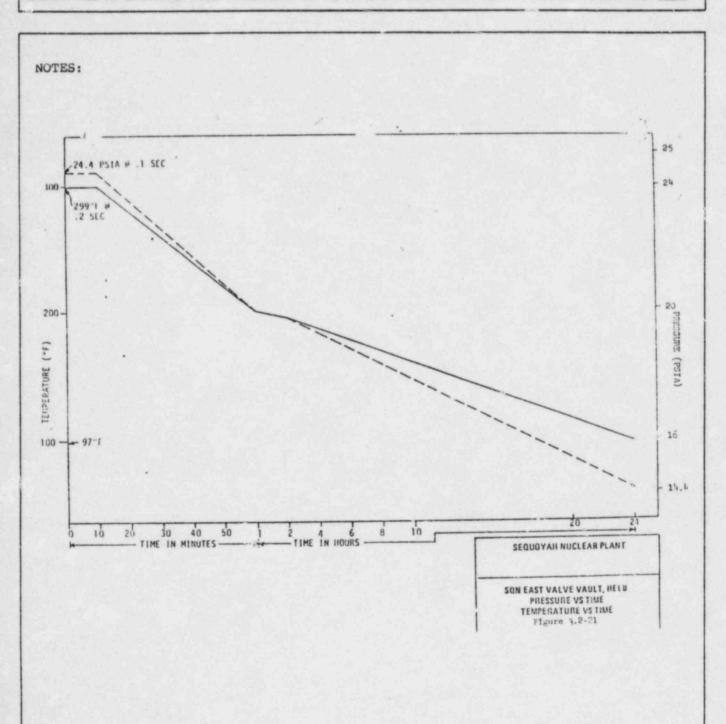


NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
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NOTES:
2. Aging radiction & accuracy have not been addressed by the licensee.
a. Aging radio Hon & accuracy have not been addressed
by the licensee.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 166

EQUIPMENT ITEM NO. 166

PRESSURE CONTROLLER LOCATED IN THE AUXILIARY BUILDING

JOHNSON CONTROLS MODEL PC-4000-2 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 166

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GAS TREATMENT FAN FLOW CONTROL

(FC-30-148, -149)

LICENSEE SUBMITTAL: SCEW(S): EEB-1047 (TABLES 3.11-6/18 AND 3.11-8/24)

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, (M) RPN, EXN, SEN, (I) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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	Aa, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 51, 5j
Installed TMI Lessons Learned Implementation Equipment Schemary	-6a, 6b
Maintenance and Replacement Schedule Summary	-7a, 7b, 7c

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	ded a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when the environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has net) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	eration (has/has nos) been provided by the tem.
X Corrective action specified b	by the Licensee:
Equipment replacement wit	ch qualified equipment
Equipment relocation abov	
	ment from radiation source
X Verify qualification by a	
Equipment relocation to a	
Qualification testing of Other (equipment in progress
	er information for this equipment item asis for justification for interim
	ovided a schedule for the proposed
400108-	.)
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	Of this TER for Legend)
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
- CIRCLED ITEM ONLY: (See Section 3 I.a Qualified	of this TER for Legend) II.c Qualified Life Deficiency
	of this TER for Legend)

NRC Contract No. NRC-09-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 166

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

RC REQUIREMENTS	DESIGNATION: X = DEFICIENCY				
ocumented Evidence of Qualification Adequate					
dequate Similarity Between Equipment and Test Specimen Estal	blished				
ging Degradation Evaluated Adequately					
qualified Life or Replacement Schedule Established (If Requi	red)				
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 Required Profile Enveloped Adequately					
o Steam Exposure (If Required) Adequate					
Criteria Regarding Spray Satisfied					
Criteria Regarding Submergence Satisfy d					
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. !)					
	DESIGNATION:				
NRC QUALIFICATION CATEGORY	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 Qualifie	ed Life				
or Replacement Schedule Justified					
III.a Equipment Exempt From Qualification					
III.b Equipment Not in the Scope of the Qualification Rev	iew				
IV Documentation Not Made Available					

PRC Contract No. NRC-03-75-118
FRC Froject No. C3257
FRC Assignment No. 13
FRC Task No. 519 / 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 166

LICENSEE RESPONSE TO NRC SER

The pressure controllers are required to operate in the following environment:

Temperature: 115°F
Pressure: Atmospheric
Relative Humidity: 100%

Radiation: 40 year TID - 3.51x103 rads Accident - 1.0x104 rads

The manufacturer's specifications for the pressure controllers are as follows:

Temperature: 125°F
Pressure: Atmospheric

Relative Humidity: Not specified

Radiation: Not Specified

The temperature and pressure environment in which the controllers are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification is continued operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

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FRC Project No. C5257
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FRC Task No. __5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 167

EQUIPMENT ITEM NO. 167

LEVEL TRANSMITTER LOCATED IN THE CONTAINMENT LOWER COMPARTMENT

BARTON MCDEL 764 (LOT 2)

REQUIRED OPERATING TIME: YEAR

TER CHECKSHEET NO. 167

LICENSEE REFERENCE(S): 1570

FUNCTION (PLANT ID): STEAM GENERATOR WIDE RANGE LEVEL (LT-3-43, -49)

LICENSEE SUBMITTAL: SCEW(S): NEB-3-7 (TABLE 3.11-4/15)

FUNCTION (PLANT ID): STEAM GENERATOR WIDE RANGE LEVEL (LT-3-56, -111)

LICENSEE SUBMITTAL: SCEW(S): NEB-3-6 (TABLE 3.11-4/15)

Section 3 of this TER for Legend)

RT, PH CS A S, (R), M I, M RPN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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Licensee Response to NRC SER	3a, 21⊳, 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, 5k, 5/, 5m
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - CNLY CHECKED ITEMS ARE APPLICABLE
X Ine Licensee (has/her not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function who environmental service conditions.	en exposed to the applicable DBE
X The Licensee has presented information ourstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment in	ration (has/has not) been provided by the tem.
Corrective action specified by	y the Licensee:
Qualification testing of	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi- and/or should be exempted from en	pment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	1		
		DESIGNATION:		
NRC REC	UIREMENTS	C = DEFICIENCY		
Documen	ated Evidence of Qualification Adequate			
Adequat	e Similarity Between Equipment and Test Specimen Establis	shea		
Aging D	Degradation Evaluated Adequately	X		
Qualifi	led Life or Replacement Schedule Established (If Required)	X		
Program	Established to Identify Aging Degradation	×		
Criteri	a Regarding Aging Simulation Satisfied (If Required)	x X X X		
Criteri	a Regarding Temperature/Pressure Exposure:			
	Peak Temperature Adequate			
0	Peak Pressure Adequate			
0	Duration Adequate			
0	Required Profile Enveloped Adequately			
0	Steam Exposure (If Required) Adequate			
	a Regarding Spray Satisfied			
Criteri	ia Regarding Submergence Satistied			
Criteri	ia Regarding Radiation Satisfied	_X_		
Criteri	ia Regarding Test Sequence Satisfied			
Criteri	ia Regarding Test Failures or Severe Anomalies	X X X X X X X X X X		
(If A	Any) Satisfied			
Criteri	ia Regarding Functional Testing Satisfied			
Criteri	ia Regarding Instrument Accuracy Satisfied	_ <u>X</u>		
Test Du	uration Margin (1 hour + Function Time) Satisfied			
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)			
		DESIGNATION:		
	ATTRICANTON CAMPCORY	X = CATEGORY		
NRC QUA	ALIFICATION CATEGORY	A - CALLOOKI		
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 L	ife		
	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	-		

FRC Project No. C5257
FRC Assignment No. 13
FRC Tesk No. 579/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 167

LICENSEE RESPONSE TO NRC SER

EN VIRONMENTAL ANALYSIS

INTRODUCTION:

The approach used to eastablish qualification for Barton (Lot 2) Transmitters combines type testing and partial analysis. Tests performed are described in Report No. NS-TMA-2184. The test sequence was essentially as follows. Radiation, Seismic Simulation Steam/Temperature/Pressure/Chemical Spray. At the end of these test the component showed no degraded performance and were within accuraty regiments.

AGING: Thermal aging was not specifically included in the program. However, using Arrhenius methodology the fifteen day testing at 250 F is equivalent to one month at an average temperature of 160 F with margin plus twelve months at 115 F with margin. This is based very conservatively on an activation evergy of 0.5 eV.

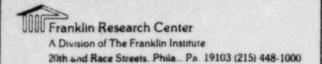
If the 10 C rule is applied, results yield a service life of 3.0 years plus the DEE. A review of the materials used in the transmitters indicates that only 'O' rings and insulation material are susceptible to thermal degradation within a 10 year period.

Margin: A comparison of environmental service conditions with test results indicated that adequate margin has been demonstrated as follows:

Parameter	Test	Required	Margin
Temp. F	370	327	43
Press. Psig	75	12,	63
Radiation Megarads	50	30	20

• Preliminary calculations for 40 year total integrated dose plus accident dose in the lower containment area outside the crane support wall. Reference TVA calculation TI-RPS-48.

Conclusion: On the basis of the above discussion, it is judged that the qualified life for these transmitters is a minimum of 5 years.

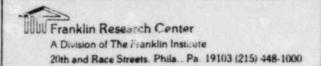


NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519 1526

Page 5

Checks	heets_	5	through	5	have	been	removed	due	to	the
proprietary	nature	of	information c	ontaine	d the	rein.				

NOTES:
6. In their aging evaluation (p. 3a), the licensee used this post-accident temperature (see note 5) to justify a 5 year gual field life. However, it is incorrect to assume that post accident aging is equivalent to equipment preaging, and such practices violate the intent of preaging requirements. Therefore, a 5 year gualified life has not been justified.
7. In the environmental analysis (p. 3a), the required radiation level is given as 30 magarads. Table 3.11-2 of the licensee's submittal gives a 40 year integrated dose of 2x10? Rads in the lower containment, and Table 3.11-2A gives an accident dose of 1x108 Rads. These inconsistences, as a result, make radiation qualification suspect for this equipment.
3 sicensee's accuracy requirements are vague and vary from 2% to 25% for this equipment. Therefore, it must be assumed that accuracy require- musts have not been met.



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Checks	neet s _	5	1	has		removed	due	to	the
		P1000	information contained	d the	rein.				

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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 519/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 168

EQUIPMENT ITEM NO. 168

PRESSURE TRANSMITTERS LOCATED IN THE CONTAINMENT

BARTON MODEL 763 (LOT 2)

REQUIRED OPERATING TIME: 5 MINUTES

TER CHECKSHEET NO. 168

LICENSEE REFERENCE(S): 1570

FUNCTION (PLANT ID): PRESSURIZER PRESSURE (PT-68-322, -323, -334, -340)

LICENSEE SUBMITTAL: SCEW(S): NEB-68-11 (TABLE 3.11-4/14)

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	la
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, 40, 4d, 4e, 4£
Equipment Environmental Qualification Review	52, 56, 50, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b.
Maintenance and Replacement Schedule Summary	Ja. 7b. 7c

Page

SUMM	ARY 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.
	GNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW RCLED ITEM ONLY: (See Section 3 of this TER for Legend)
	Qualified II.c Qualified Life Deficiency
II.a	Modification III.a Exempt Qualification Not Estatished III.b Not in Scope
11.0	Not Qualified IV Documentation Not Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM				
	[사용][[[[[[] [[] [] [] [] [] [] [] [] [] []	DESIGNATION:		
NRC REQU	<u>IREMENTS</u>	DEFICIENCE		
Adequate Aging De Qualifie Program Criteria Criteria O H O H	ced Evidence of Qualification Adequate Similarity Between Equipment and Test Specimen Established and Evaluated Adequately Ed Life or Replacement Schedule Established (If Required) Established to Identify Aging Degradation Established (If Required)	× ×		
Criteria Criteria Criteria Criteria Criteria	Steam Exposure (If Required) Adequate a Regarding Spray Satisfied a Regarding Submergence Satisfied a Regarding Radiation Satisfied a Regarding Test Sequence Satisfied a Regarding Test Failures or Severe Anomalies			
Criteria Criteria Test Du	ny) Satisfied a Regarding Functional Testing Satisfied a Regarding Instrument Accuracy Satisfied ration Margin (1 hour + Function Time) Satisfied a Regarding Margins Satisfied (NUREG-0588, Cat. I)	<u>=</u>		
NRC QUA	LIFICATION CATEGORY	DESIGNATION: X = CATEGORY		
I.a I.b II.a II.b	Equipment Qualified Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified	<u>×</u>		
III.a III.a	Equipment Satisfies All Requirements Except Qualified La or Replacement Schedule Justified Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review Documentation Not Made Available	1.Ze		

PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5/9/526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 168

LICENSEE RESPONSE TO NRC SER

EN VIRONMENTAL ANALYSIS

INTRODUCTION:

The approach used to eastablish qualification for Barton (Lot 2)
Transmitters combines type testing and partial analysis. Tests
performed are described in Report No. NS-TMA-2184. The test sequence
was essentially as follows. Radiation, Seismic Simulation
Steam/Temperature/Pressure/Chemical Spray. At the end of these test
the component showed no degraded performance and were within accuraty
reuirements.

AGING: Thermal aging was not specifically included in the program.

However, using Arrhenius methodology the fifteen day testing at
250 F is equivalent to one month at an average temperature of 160 F
with margin plus twelve months at 115 F with margin. This is based
very conservatively on an activation every of 0.5 eV.

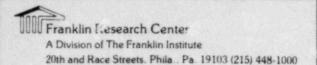
If the 10 C rule is applied, results yield a service life of 3.0 years plus the DEE. A review of the materials used in the transmitters indicates that only 'O' rings and insulation material are susceptible to thermal degradation within a 10 year period.

Margin: A comparison of environmental service conditions with test results indicated that adequate margin has been demonstrated as follows:

Parameter	Test	Required	Margin
Temp. F	370	327	43
Press. Psig	75	12,	63
Radiation Megarads	50	30	50

Preliminary calculations for 40 year total integrated dose plus accident dose in the lower containment area outside the crane support wall. Reference TVA calculation TI-RPS-48.

Conclusion: On the basis of the above discussion, it is judged that the qualified life for these transmitters is a minimum of 5 years.



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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 169

EQUIPMENT ITEM NO. 169

LEVEL TRANSMITTER LOCATED IN THE CONTAINERS

BARTON MODEL 764 (LOT 2)

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 169

LICENSEE REFERENCE(S): 1570

FUNCTION (PLANT ID): STEAM GENERATOR LEVEL (2-LT-3-38, -39, -42, -51, -52,

-97, -106, -107)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-52 (TABLE 3.11-4-2/2)

FUNCTION (PLANT ID): CONTAINMENT LEVEL (2-LT-63-176, -177, -178, -179)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-52 (TABLE 3.11-4-2/2)

FUNCTION (PLANT ID): PRESSURIZER LEVEL (2-PT-68-320, -335, -339)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-52 (TABLE 3.11-4A-2/1)

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, (M) RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF AFPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3o, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
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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IMM	MARY OF LICENSEE RESPONSES TO THE NPC SER - ONLY CHECKED ITEMS ARE APPLICAB
4	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.
7	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 equironmental qualification.
	GNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW RCLED ITEM ONLY: (See Section 3 of this TER for Legend)
	Qualified II.c Qualified Life Deficiency Modification III.a Exempt
.a	Qualification Not Established III.b Not in Scope Not Qualified IV Documentation Not Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 169

	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	1
		DESIGNATION:
NRC REQ	<u>UIREMENTS</u>	K = DEFICIENCY
Documen	ced Evidence of Qualification Adequate	<u></u>
Adequate	e Similarity Between Equipment and Test Specimen Establis	shed
ging D	gradation Evaluated Adequately	_X_
Qualifi	ed Life or Replacement Schedule Established (If Required)	<u>X</u>
Program	Established to Identify Aging Degradation	shedXXX_
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	= = = = = =
0	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Rejarding Submergence Satisfied	
Criteri	a Regarding Radiation Satisfied	<u>×</u>
Criteri	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
	ny) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Salisfied	_X_
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	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 L	ife
	or Replacement Schedule Justified	
	Equipment Exempt From Qualification	
III.a		
III.a III.b	Equipment Not in the Scope of the Qualification Review Documentation Not Made Available	=

For detailed evaluation, see item # 167

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

LICENSEE RESPONSE TO NRC SER

EN VIRONMENTAL ANALYSIS

INTRODUCTION:

The approach used to eastablish qualification for Barton (Lot 2)
Transmitters combines type testing and partial analysis. Tests
performed are described in Report No. NS-TMA-2184. The test sequence
was essentially as follows. Radiation, Seismic Simulation
Steam/Temperature/Pressure/Chemical Spray. At the end of these test
the component showed no degraded performance and were within accuraty
reuirements.

AGING: Thermal aging was not specifically included in the program.

However, using Arrhenius methodology the fifteen day testing at
250 F is equivalent to one month at an average temperature of 160 F
with margin plus twelve months at 115 F with margin. This is based
very conservatively on an activation evergy of 0.5 eV.

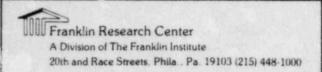
If the 10 C rule is applied, results yield a service life of 3.0 years plus the DEE. A review of the materials used in the transmitters indicates that only '0' rings and insulation material are susceptible to thermal degradation within a 10 year period.

<u>Margin:</u> A comparison of environmental service conditions with test results indicated that adequate margin has been demonstrated as follows:

Parameter	Test	Required	Margin
Temp. F	370	327	43
Press. Psig	75	12,	63
Radiation Megarads	50	30	20

Preliminary calculations for 40 year total integrated dose plus accident to e in the lower containment area outside the crane support wall. Reference TVA calculation TI-RPS-48.

Conclusion: On the basis of the above discussion, it is judged that the qualified life for these transmitters is a minimum of 5 years.



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FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 170

EQUIPMENT ITEM NO. 170

CONTROL SWITCH LOCATED IN THE AUXILIARY BUILDING

CUTLER-HAMMER MODEL 10250T

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 170

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): LOCAL CONTROL (VARIOUS)

SERVICE: LOCAL CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-HS-2-2 (3.11-8-2 PAGES 6, 7, 8. AND 9)

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

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

Not stated, Not applicable

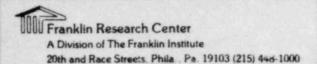
LISTING OF APPLICABLE CHECKSHEETS:

Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 4e, 4d, 4e, 4f
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	62, 6b-
그가 하다 않는데 하는 사람이 없는 사람들이 되었다면 살아지는 것이 있는데 나를 하는데 하는데 없다면 살아 없다면 하는데 없다면 살아 없다면 살아 없다면 살아 없다면 살아 없다면 살아 없다면 살아	

Page

SUMMARY OF LICENSES RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/has not) provid	led a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when the environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
✓ Justification for interim ope Licensee for this equipment i	ration (has has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
	e submergence level ent from radiation source dditional (testing/analysis)
X Qualification testing of Other (equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF RESULTANT NRC QU	ATION EVALUATION CATEGORY BASED ON REVIEW 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



NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ____526

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	EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM	
		DESIGNATION:
IRC REO	<u>UIREMENTS</u> X	= DEFICIENCY
ocumen	ted Evidence of Qualification Adequate	hed
dequat	e Similarity Between Equipment and Test Specimen Establis	hed
aging D	egradation Evaluated Adequately	
Qualif:	ed Life or Replacement Schedule Established (If Required)	
Program	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
	a Regarding Temperature/Pressure Exposure:	
0	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	=
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC QUA	ALIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified	
	Equipment Qualification Pending Modification	
I.b		
I.b II.a	Equipment Qualification Not Established	
I.b II.a II.b	Equipment Qualification Not Established Equipment Not Qualified	
I.b II.a II.b	Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Li	
I.b II.a II.b II.c	Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Li or Replacement Schedule Justified	
I.b II.a II.b II.c	Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Li	

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
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FRC Task No. ___526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 170

LICENSEE RESPONSE TO NRC SER

EEB-HS-2-2 Appendix 1, Rev 1

HANDSWITCHES (Cutler-Hammer Type 10250T)

The switches are oiltight, dustright, and moisture resistant. They are mounted on sealed NEMA 4 enclosures and therefore are not affected by humidity or submergence. The material composition of the selector switch components is mineral-filled phenolic. This material is unaffected by radiation doses up to 3.9 x 108 rads (1) and has a deflection temperature of $\frac{33097}{2000}$ (2) at 66 psia with a maximum recommended service temperature of $\frac{43007}{2000}$ (2). The above ratings envelope the environmental conditions in all areas of the plant.

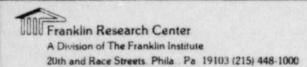
No aging test data is available for the switches. However, samples of these switches have been included in connection with additional HELB tests to be performed at Wyle Laboratories in Huntsville, Alabama. Test results are expected to be available in January 1982.

 Radiation data from the Battelle Memorial Institute Radiation Effects Information Center report No. REIC 21, dated 1961, "The Effect of Nuclear Radiation on Elastomeric and Plastic Components and Materials," by R. W. King, N. J. Broadway, and S. Palinchak.

(2) Temperature data from Materials Engineering, 1981 Materials Selector, Volume 92(b), dated December 1980.

3.11-8-2, Sheet 6
3.11-8-2, Sheet 7
3.11-8-2, Sheet 7
3.11-8-2, Sheet 8
3.11-8-2, Sheet 8
3.11-8-2, Sheet 9
HELB - Nodes 15 and 16
HELB - Node 17

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NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ____526

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PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ______526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17/

EQUIPMENT ITEM NO. 171

CONTROL SWITCH LOCATED IN THE AUXILIARY BUILDING

CUTLER-MAMMER MODEL 10250T

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 171

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): LOCAL CONTROL (VARIOUS)

SERVICE: LOCAL CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-HS-2-2 (3.11-8-2 PAGES 4, 5, AND 9)

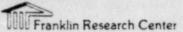
DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM S) ONLY: (See Section 3 of this TER for Legend)

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
Equipment Environmental Qualification Review	5 a, 5b, 5c, 5d, 3e, 5f, 4 g, 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
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FRC Assignment No. 13
FRC Task No. ____526

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
X The Licensee (has/her not) provid	led a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented inform outstanding qualification deficie	nation which shows there are no encies.
X The Licensee (has/has not) propos item whose qualification has not	ed a corrective action for this equipment been fully established.
✓ Justification for interim ope Licensee for this equipment i	eration (has/has not) been provided by the tem.
X Corrective action specified b	y the Licensee:
Equipment replacement wit	
Equipment relocation abov	
Relocate or shield equipm	ent from radiation source
- verify qualification by a	dditional (testing/analysis)
Equipment relocation to a X Qualification testing of	equipment in progress
Other ()
The Licensee has provided oth that can be construed as a ba operation.	er information for this equipment item sis for justification for interim
The Licensee (has/mac not) processive action. (Schedule action 820101	ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II a Qualification Not Established	III.b Not in Scope
11.b Not Qualified	IV Documentation Not Available

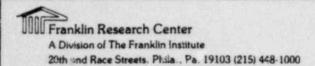
IV

Documentation Not Made Available

FRC Project No. C5257
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EQUIPMENT ENVI	RONMENTAL QUALIFICATION SUMMARY FORM	
	DESIGNATIO	
NRC REQUIREMENTS	X = DEFICIE	ENCY
Documented Evidence of Quality	fication Adequate	X
	Equipment and Test Specimen Established	
Aging Degradation Evaluated A		
	t Schedule Established (If Required)	
Program Established to Identi		
		-
Criteria Regarding Temperatur		
o Peak Temperature Adequ		
o Peak Pressure Adequate	e	-
o Duration Adequate		-
o Required Profile Envel		
o Steam Exposure (If Rec		-
Criteria Regarding Spray Sati	isfied	
Criteria Regarding Submergeno		-
Criteria Regarding Radiation Satisfied		
Criteria Regarding Test Seque		
Criteria Regarding Test Fails	ures or Severe Anomalies	
(If Any) Satisfied		-
Criteria Regarding Functional		
Criteria Regarding Instrument		
Test Duration Margin il hour		
Criteria Regarding Margins Sa	atisfied (NUREG-0588, Cat. I)	
	DESIGNAT	TION:
NRC QUALIFICATION CATEGORY	X = CATE	EGORY
I.a Equipment Qualified		
I.b Equipment Qualificat:	ion Pending Modification	X
II.a Equipment Qualificat:	ion Not Established	
II.b Equipment Not Qualif:		
II.c Equipment Satisfies	All Requirements Except Qualified Life	
or Replacement Sched		
III.a Equipment Exempt From		-
III.b Equipment Not in the	Scope of the Qualification Review	



NRC Contract No. NRC-03-79-118
FRC Project No. C5257
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FRC Task No. __526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 171

LICENSEE RESPONSE TO NRC SER

EEB-HS-1-2 Appendix 1, Rev 1

HANDSWITCHES (Cutler-Hammer Type 10250T)

The switches are oiltight, dusttight, and moisture resistant. They are mounted on sealed NEMA 4 enclosures and therefore are not affected by humidity or submergence. The material composition of the selector switch components is mineral-filled phenolic. This material is unaffected by radiation doses up to 3.9×10^8 rads (1) and has a deflection temperature of 335° F (2) at 66 psia with a maximum recommended service temperature of 400° F (2). The above rations envelope the environmental conditions in all areas of the plant.

No aging test data is available for the switches. However, samples of these switches have been included in connection with additional HELB tests to be performed at Wyle Laboratories in Huntsville, Alabama. Test results are expected to be available in January 1982.

RI

- (1) Radiation data from the Battelle Memorial Institute Radiation Effects Information Center report No. REIC 21, dated 1961, "The Effect of Nuclear Radiation on Elastomeric and Plastic Components and Materials," by R. W. King, N. J. Broadway, and S. Palinchak.
- (2) Temperature data from Materials Engineering, 1981 Materials Selector, Volume 92(b), dated December 1980.

*Table -

Location

3.11-8-2,	Sheet	4	Auxiliary Building - West Valve Room	,
3.11-8-2,	Sheet	5	Auxiliary Building - East Valve Room	
3.11-8-2,	Sheet	9	HELB - Node 17	

Page 5f

M. O. S. Att Not N. G.
The Jucinsee has stated that The derice is compared of
mineral-filled Theralic and is ineffected by poliation doses
up to 3.9 x 108 rads. The house has not luchested the
orte organic materials weeker the levice (e.g. reganic
gasket for mounting The Sewie , organic Can mechanism.
a complete evaluation of the effects of the harsh condition on these material, this equipment item must be assigned
a complete evaluation of the effects of the harsh condition
on here material, this equipment item must be assigned
to category I Qualification not established.
-00

NRC Contract No. NRC-03-79-113
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 526

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 172

EQUIPMENT ITEM NO. 172

FLOW SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 1627

RECUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 172

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): FAN INTERLOCK (FS-30-157, -184, -185, -200, -207)

SERVICE: FAN FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1049-2 (3.11-6-2/1 AND 3.11-8-2/1)

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

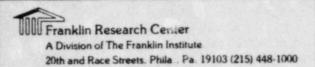
Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b .

7a, 7b, 7c

Page 1b

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
× The Licensee (has/has not) provid	ded a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when the environmental service conditions.	그림으로 하면 이렇게 하는데 하면 하는데 이번 때문에 되었다면 하는데 그렇게 그렇게 되었다면 하는데
The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	eration (has/ has not) been provided by the tem.
× Corrective action specified b	by the Licensee:
Equipment replacement wit Equipment modification Equipment relocation abov Relocate or shield equipm Verify qualification by a Equipment relocation to a Qualification testing of Other (re submergence level ment from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
[[- [- [- [- [- [- [- [- [- [ovided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFIC - CIRCLED ITEM ONLY: (See Section 3	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



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IRC REO	UIREMENTS	DESIGNATION: X = DEFICIENCY
		×
ocumen	ted Evidence of Qualification Adequate	ished
dequat	e Similarity Between Equipment and Test Specimen Establ	Ished
ging D	egradation Evaluated Adequately	
qualifi	ed Life or Replacement Schedule Established (If Required	u)
rogram	Established to Identify Aging Degradation	
Criteri	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	\equiv
Criteri	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
	nny) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION
NRC QUA	ALIFICATION CATEGORY	X = CATEGOR
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	
	Equipment Exempt From Qualification	
III.a III.b	Equipment Exempt From Qualification Equipment Not in the Scope of the Qualification Review	_

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

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 172

LICENSEE RESPONSE TO NRC SER

Sheet No.	EEB-1049-2
Revision	1
Appendix	3
Sheet 1 of	1

The flow switches are required to operate in the following environments

Temperature: Pressure:

121°F Atmospheric 100%

Relative Humidity: Radiation:

40 year TID 3.5 x₄10² rads (FS-30-157,184,185) R7 Accident - 1 x 10⁴ rads 40 year TID - 3.5₇x 10² rads (FS-30-200,207) R7 Accident - 1 x 10⁷ rads

The manufacturer's specifications for the flow switches are as follows:

Temperature: 130°F Pressure:

Atmospheric Relative Humidity: Not Specified Radiation: Not Specified

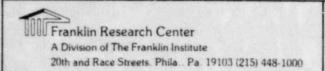
FS-30-157,184,185 The temperature and pressure environment in which these flow switches are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

FS-30-200,207 These flow switches are not qualified for their radiation environment. They are in the process of being relocated to a less severe environment, which will satisfy generic position 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation, additional testing and analysis are being performed by Wyle Laboratories.

RI

R1



NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 173

EQUIPMENT ITEM NO. 173

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

HONEYWELL MODEL T675A 1540

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 173

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIA BUILDING GENERAL SUPPLY FANS (TS-30-140A)

SERVICE: FAN 2A AND 2B INTAKE TEMPERATURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1050-2 (3.11-6-2 PAGE 2)

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

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

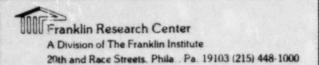
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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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SUMMAR	OF LICENSEE RES	PONSES TO THE N	IRC SER	- ONLY CHECK	ED ITEMS ARE A	PPLICABLE
X The	Licensee (has/h	as not) provide	d a res	ponse to the	SER concerns.	
qua	Licensee (has/halified and/or will rironmental service	ll function whe				s
	Licensee has prostanding qualific			ich shows th	ere are no	
	Licensee (has/ham whose qualific					uipment
_×	Justification for Licensee for the			has/h as no t)	been provided	by the
土	Corrective action	on specified by	the Lie	censee:		
	Verify qual: Equipment re Qualification Other (odification elocation above shield equipme ification by ad elocation to a on testing of e	submerg nt from ditional mild en quipment	gence level radiation so (testing/arvironment in progress	ource nalysis)	
	The Licensee has that can be cons operation.				The second secon	item
×	The Licensee (action action		for acco	omplishing th)
	Licensee states /or should be exe					ication
	TION OF RESULTANTED ITEM ONLY: (S					REVIEW
I.b Mo	alified dification alification Not B	Established	III.a III.b	Exempt Not in Scope		
II.b No	t Qualified		IV	Documentation	on Not Availab	le



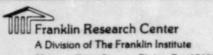
NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ____526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 173

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQ	UIREMENTS	DESIGNATION: X = DEFICIENCY
	ted Evidence of Qualification Adequate	x
ocumen	e Similarity Between Equipment and Test Specimen Establ	lished X
dequat	egradation Evaluated Adequately	
ging D	ed Life or Replacement Schedule Established (If Require	ed)
ualiti	Established to Identify Aging Degradation	
ribari	a Regarding Aging Simulation Satisfied (If Required)	
riteri	a Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate Duration Adequate	
	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
criteri	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
	a Regarding Test Failures or Severe Anomalies	
	nny) Satisfied	-
Criteri	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC OU	ALIFICATION CATEGORY	X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	<u>×</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 Revie	w
IV	Documentation Not Made Available	



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 173

LICENSEE RESPONSE TO NRC SER

Sheet No.	EEB-1050-2
Revision	1 .
Appendix	3
Sheet 1 of	1

The switch is required to operate in the following environment:

Temperature: 115°F
Pressure: Atmosph

Pressure: Atmospheric Relative Humidity: 1003

Radiation: 40 years TID - 3.51x 10² rads Accident - 1.0 x 10⁴ rads

The manufacturer's specifications for the switch are as follows:

Temperature: 125°F Pressure: Atmospheric

Relative Humidity: Normal Plant Environment

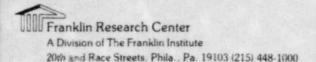
Radiation: Not Specified

The temperature and pressure environment in which the switch is located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace this switch with a qualified replacement.

RT

RI



NRC Contract No. NRC-03-79-118
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FRC Assignment No. 13
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 174

EQUIPMENT ITEM NO. 174

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

FENWAL MODEL 18003-7

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 174

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GENERAL SUPPLY FANS (TS-30-140)

SERVICE: FAN 2A AND 2B INTAKE TEMPERATURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1046-2 (3.11-6-2 PAGE 2)

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

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

Not stated, Not applicable

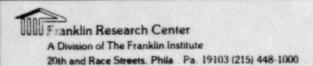
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 30, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5a, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	6a, 6b
Maintenance and Replacement Schedule Summary	7a, 7b, 7o-

A Division of The Franklin Institute 20th and Race Streets. Phila. Pz 19103 (215) 448-1000 NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____526

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SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICA	BLE
The Licensee (has/has tot) 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.	t
	е
X Corrective action specified by the Licensee:	
Equipment replacement with qualified equipment Equipment modification Equipment relocation above submergence level Relocate or shield equipment from radiation source Verify qualification by additional (testing/analysis) Equipment relocation to a mild environment 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.	n
DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)	N
I.a Qualified II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope II.b Not Qualified IV Documentation Not Available	



NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM				
		DESIGNATION:		
NRC REO	UIREMENTS	X = DEFICIENCY		
ocumen	ted Evidence of Qualification Adequate	shed ×		
dequat	e Similarity Between Equipment and Test Specimen Establi	sned		
ging D	egradation Evaluated Adequately ed Life or Replacement Schedule Established (If Required			
ualifi	1)			
Program	Established to Identify Aging Degradation			
riteri	a Regarding Aging Simulation Satisfied (If Required)			
	a Regarding Temperature/Pressure Exposure:			
0	Peak Temperature Adequate			
	Peak Pressure Adequate			
	Duration Adequate			
	Required Profile Enveloped Adequately			
o Steam Exposure (If Required) Adequate				
Criteri	a Regarding Spray Satisfied			
	a Regarding Submergence Satisfied			
Criteria Regarding Radiation Satisfied Criteria Regarding Test Sequence Satisfied				
	ny) Satisfied			
	a Regarding Functional Testing Satisfied			
Criteri	a Regarding Instrument Accuracy Satisfied			
Test Du	ration Margin (1 hour + Function Time) Satisfied			
Criteri	a Regarding Margins Satisfied (NUREG-0588, Cat. I)			
		DESIGNATION:		
NRC QUA	ALIFICATION CATEGORY	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			

NRC Contract No. NRC-03-79-118
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EQUIPM

ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 174

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB 1046-2 Revision 1

Appendix 3

Sheet 1 of 1

The switch is required to operate in the following environment:

Temperature: 1150F Pressure: Atmospheric Relative Humidity: 100%

Radiation: 40 year TID - 3.51x103 rads Accident - 1.0x104 rads

R1

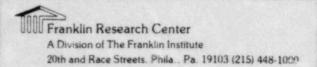
The manufacturer's specifications for the switch is as follows:

Temperature: 6000F
Pressure: Atmospheric
Relative Humidity: Not specified
Radiation: Not Specified

The temperature and pressure environment in which the switches are located is less severe than the manufacturer's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation additional testing is being performed by Wyle Laboratories.

R1



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 175

EQUIPMENT ITEM NO. 175

ELECTRICAL CABLE LOCATED IN THE CONTAINMENT

EATON CORP, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 175

LICENSEE REFERENCE(S): 1802, 4421

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-4-2

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,

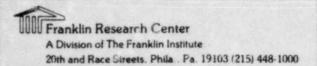
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

Page

UMMARY OF LICENSEE RESPONSE	ES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
The Licensee (has/has me	provided a response to the SER concerns.
	et) specifically stated that the equipment is unction when exposed to the applicable DBE onditions.
The Licensee has present outstanding qualification	ted information which shows there are no on deficiencies.
	ot) proposed a corrective action for this equipment n has not been fully established.
Justification for in Licensee for this eq	nterim operation (has/has not) been provided by the quipment item.
Corrective action sp	pecified by the Licensee:
Equipment modifi	
Equipment reloca	ation above submergence level eld equipment from radiation source ation by additional (testing/analysis)
Relocate or shie	eld equipment from radiation source
Verify qualifica	ation by additional (testing/analysis)
	ation to a mild environment esting of equipment in progress
Other ()
	ovided other information for this equipment item ed as a basis for justification for interim
	as not) provided a schedule for the proposed (Schedule for accomplishing the corrective .)
	the equipment item does not require qualification ed from environmental qualification.
	QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW
CIRCLED ITEM ONLY: (See S	Section 3 of this TER for Legend)
a Qualified	II.c Qualified Life Deficiency
b Modification	III.a Exempt
.a Qualification Not Estab	
I.b Not Qualified	IV Documentation Not Available



FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 5256

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 175

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualified I.a

Equipment Qualification Pending Modification

Equipment Satisfies All Requirements Except Qualified Life

Equipment Not in the Scope of the Qualification Review

Equipment Qualification Not Established

or Replacement Schedule Justified Equipment Exempt From Qualification

Documentation Not Made Available

Equipment Not Qualified

I.b

II.a II.b

II.c

III.a

III.b

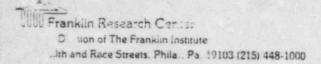
Page 3a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 175

LICENSEE RESPONSE TO NRC SER

Brand-Rex - Contract No. 822000

- a. Qualification is by test as described in Franklin Institute Report F-C4113 and Brand-Rex Long Term Thermal Aging - Arrhenius Plot, May 30, 1978.
- b. The test program was based on the guidelines of IEEE-383-1974. The test program was to demonstrate that the subject cables will function during and after LOCA.
- c. The cables were aged for seven days at 136° C and then irradiated to 2 x 10^{8} RADS, prior to steam/chemical spray test. Test was performed on the specimens after irradiation.
- d. The cables were exposed to a steam/chemical spray environment for 30 days (see Appendix 2). Throughout this time, the cable were sprayed with a H₃BO₃ (3000 ppm boron) solution buffered to a PH of 10.0 to 10.5.
- e. During the entire steam/chemical spray exposure the conductors were energized and tested.
- f. Further testing and inspection was performed after simualted lock testing.
- g. It is concluded from the above tests and using the Arrhenius technique that all cables will function for at least 40 years at a continuous operating temperature of 90°C and that all cables will perform satisfactorily during and after LOCA.
- h. It is concluded from the above test and from the generic envelope shown in Appendix C of NUREG 0588 that the cables will satisfactorily function during and after the postulated main steam line break.



FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 526

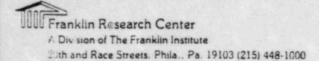
Page 52

Nomed
NOTES:
The licensee has not provided sufficient information to establish that the
Equipment described on the SCEW sheet is the same as the Equipment described
in the referenced report.
그 얼마나 하는 것 같아. 그는 그 그는 그

A Division of The Franklin Institute 20th and Race Streets. Phila. Pa. 19103 (215) 448-1000 PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. ______

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NOTES:				
Requirements for establishing similarity between installed and tested cables				
	Guidelines and IEEE 383-7			
below for convenience.				
2. Test Specimen	- The test specimen should be the same m	odel as the		
equipment being	ng qualified. The type test should only	be considered valid		
for equipment	identical in design and material constru	ction to the test		
specimen. Any	deviations should be evaluated as part	of the qualifica-		
tion documents	ction (see also Section 8.0 below).			
		ZSIOC		
	1.3.1 Cable Description. This description or specification should include as a minimum: 1.3.1.1 Conductor — material identification. size. strandins. coating. 1.3.1.2 Insulation — material identification. thickness, method of application. 1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors. fillers. binders. 1.3.1.4 Shielding — tapes. extrusions. braids. or others. 1.3.1.5 Covering — jacket or metallic armor or both. material identification. thickness. method of application. 1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Splice or Connection Description or Both. This description or specification should include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembly. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.			
showers, job control of the lists sentated test	Type Test Samples. The samples tested id contain the conductor, insulation, fill-neller, binder tape, overall jacket, shield-ind field splices which are representative e coble category being caulified. Table 1 sizes which have been considered represative of these categories. The sample his should be sufficient to permit reliable readings and evaluation consistent with testing practice.			



Page 5 C

	Table 1 Represensentative Cables fo	r Type Tests	
Type	Test		Size
Up to 2000 V multiconductor	temperature and moisture	2.3.1	1/C - 14 or 12 AWG
control cable or Shielded multiconductor	resistance		
signal cable (see list below for individual component) or	thermal and radiation exposure	2.3.3	1/C or M/C -
Single conductor power cable	design basis event simulation	2.4	14 or 12 AWG 1/C or M/C — 14 or 12 AWG
	vertical flame test singles from cable	2.5.6	1/C - 6, 4 or 2 AWG 1/C - 14 or 12 AWG
	assembly		
*	vertical tray flame test	2.5.4	7/C - 16, 14 or 12 AW
Shielded pairs, triple or \$.120 from multiconductor signal cable:	temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cab e
signal capie.	thormal and radiation exposure	2.3.3	
	design basis event	2.4	
	simulation vertical flame test	2.5.6	
Coaxial, triaxial or special instrument cable	temperature and moisture	2.3.1	actua, size
epocial restrictive cause	thermal and radiation	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	2.3.1	2/C - 20 AWG or secual size if smaller
	thermal and radiation	2.3.3	and it amount
	design basis event	2.4	
	simulation 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 lest	2.5,4	6 AWG (2-5kV) 2/O or 4/O or
			4/O (2-15kV)
	arianian li		
	cription discussed		
report(s) apply t	certification from o the cables furni		

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. 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 176

EQUIPMENT ITEM NO. 176

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

SAMUEL MOORE, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 176

LICENSEE REFERENCE(S): 1802, 4421

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-5-2

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:

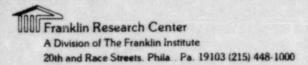
Maintenance and Replacement Schedule Summary

Contents	Checksheet Page No.
Equipment Item	la
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, 40, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5£, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	-6a, 6b

7a, 7b, 7c

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
✓ The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and or will function who environmental service conditions.	
The Licensee has presented information outstanding qualification deficient	
The Licensee (has/has not) propose item whose qualification has not has	ed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment is	ration (has/has not) been provided by the tem.
Corrective action specified by	y the Licensee:
Equipment relocation to a Qualification testing of	e submergence level ent from radiation source dditional (testing/analysis) mild environment
The Licensee has provided other that can be construed as a base operation. The Licensee (has/has not) procorrective action. (Schedule action)	er information for this equipment item sis for justification for interim ovided a schedule for the proposed for accomplishing the corrective
	pment item does not require qualification
DESIGNATION OF RESULTANT NRC QUALIFICATION 3 CONTROL OF THE CONTRO	ATION EVALUATION CATEGORY BASED ON REVIEW 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
Trib not Augitifed	TY DOCUMENTACION NOC AVAILABLE



NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 525

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM					
		DESIGNATION:			
NRC REC	X = DEFICIENCY				
Documented Evidence of Qualification Adequate					
Adequat	e Similarity Between Equipment and Test Specimen Establi	shed <			
Aging I	Degradation Evaluated Adequately				
Qualifi)				
Program	Established to Identify Aging Degradation				
Criteri	ia Regarding Aging Simulation Satisfied (If Required)				
Criteri	a Regarding Temperature/Pressure Exposure:				
0	Peak Temperature Adequate				
0	-				
	Duration Adequate				
0	Required Profile Enveloped Adequately Steam Exposure (If Required) Adequate				
0					
Criteri					
Criteri					
	ia Regarding Radiation Satisfied				
Criter	ia Regarding Test Sequence Satisfied				
	ia Regarding Test Failures or Severe Anomalies				
(If)	Any) Satisfied				
Criteri	ia Regarding Functional Testing Satisfied				
Criter	ia Regarding Instrument Accuracy Satisfied				
Test Du	uration Margin (1 hour + Function Time) Satisfied				
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)				
		DESIGNATION:			
NDC OTT	ALTERCATION CAMECODY	X = CATEGORY			
NRC QUA	ALIFICATION 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 L	ife			
	or Replacement Schedule Justified				
III.a	Equipment Exempt From Qualification				
III.D	Equipment Not in the Scope of the Qualification Review				
IV	Documentation Not Made Available				

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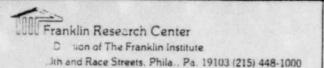
EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 176

LICENSEE RESPONSE TO NRC SER

Moore

Eaton Corporation, Samuel Operations - Contract No. 826598

- 1. Qualification is by tests as described in the following reports:
 - Isomedix Qualification Test for Samuel Moore & Company, dated June 1978. (LOCA)
 - Isomedix Qualification Test for Eaton Corporation, Samuel Moore Operations, dated January 1980. (MSLB)
- D. The test programs were based on the guidelines of IEEE 323-1974 and IEEE 383-1974. Aging was per the Arrhenius technique.
- c. The June 1978 (LOCA) cables were subjected to sequential exposures of thermal aging and radiation, followed by an exposure to a chemical spray environment for 30 days. Cables were aged for seven days at 121°C and then irradiated to an accumulated dose of 2x10° RADS. The chemical spray consisted of H₃BO3 (3000 ppm boron) and Na₂S₂O₃ buffered to a pH of 9.0 to 11.0. (Environmental condition profile in appendix 2).
- d. The January 1980 (MSLB) cables were subjected to sequential exposures of thermal aging and radiation, followed by an exposure to two environments of superheated steam. Cables were aged for seven days at 121°C and then exposed to superheated steam conditions shown in appendix 2.
- All conductors were energized during the entire exposure to LOCA and MSLB environments. Cables were tested before and after thermal aging.

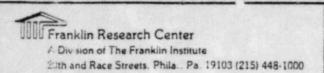


Page 5a

NOTES:
The licensee has not provided sufficient information to establish that the
Equipment described on the SCEW sheet is the same as the Equipment described
in the referenced report.

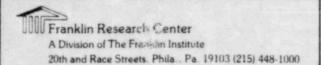
Page 5b

equirements for estab	lishing similarity between in	stalled and tested cables
re contained in the D	OR Guidelines and IEEE 383-74	which are reproduced
elow for convenience.		
2. Test Specin	nen - The test specimen should be the same mor	del as the
equipment b	eing qualified. The type test should only be	considered valid
for equipme	the identical in design and material construct	tion to the test
specimen.	Any deviations should be evaluated as part of	f the qualifica-
tion docume	entation (see also Section 8.0 below).	
	[0	ZSIO
	IEEE-383	
	1.3.1 Cable Description. This description or	
	specification should include as a minimum: 1.3.1.1 Conductor — material identi-	
	fication, size, stranding, coating. 1.3.1.2 Insulation — material identi-	
	ficution, thickness, method of application. 1.3.1.3 Assembly (multiconductor cables —	
	only) - number and arrangement of con-	
	ductors, fillers, binders, 1.3.1.4 Shielding — tapes, extrusions, —	
	braids, or others. 1.3.1.5 Covering — jacket or metallic ar-	
	mor or both, material identification, thick- ness, method of application.	
	1.3.1.6 Characteristics - voltage and	
	For instrumentation cables — capacitance.	
	attenuation, characteristic impedance, micro- phonics, insulation resistance, as applicable.	
	1.3.1.7 Identification — manufacturer's trade name, catalog number.	
	1.3.2 Field Splice or Connection Description	
	or Both. This description or specification should include as a minimum:	
	1.3.2.1 Whether factory or field assem-	
	1.3.2.2 Conductor connection — type, material identification, and method of assem-	
	bly.	
	1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.	
	.2 Type Test Samples. The samples tested -	
	hould contain the conductor, insulation, fill-	
	rs, inclust, binder tape, overall jacket, shield- ng, and field spiles which are representative	
	the cable category being qualified. Table 1	
	ists sizes which have been considered repre-	
the state of the s	engths should be sufficient to permit reliable	
	est readings and evaluation consistent with 7	



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RESCINIC CABLES, FIELD S	PLICES, AND CONNECTIONS		Std 383-1974
	Table 1 Represensentative Cables fo		
Туре	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded multiconductor	temperature and moisture resistance	2.3.1	1/C - 14 or 12 AWG
signal cable (see list below for individual component) or Single conductor power cable	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 1/C - 6, 4 or 2 AWG
	vertical flame test singles from cable assembly	2.5.6	1/C - 14 or 12 A'VG
	vertical tray fiame test	2.5.4	7/C - 16, 14 or 12 AW
Shielded pairs, triple or Qua's from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
	thermal and radiation exposure design basis event	2.3.3	
	simulation		
Coaxial, triaxial or	vertical flame test temperature and moisture	2.5.6	actua, size
special instrument cable	resistance - thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test singles from caule assembly	2.5.6	
Single pair therrauchuple extension cable	temperature and moisture resistance	2.3.1	2/C = 20 AWG or actual size if smaller
	thermal and radiation exposure design basis event	2.3.3	
	situulation		
	vertical tray flame test vertical flame test surgies from cable assembly	2.5.4 2.5.6	
2001-15 000 V power cable 1/C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5kV) 2/0 or 4/0 or
		2.5.4	



PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 177

EQUIPMENT ITEM NO. 177

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

SAMUEL MOORE, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 177

LICENSEE REFERENCE(S): 1802, 4421

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-6-2

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, RFS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3e, 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	62, 6b
Maintenance and Replacement Schedule Summary	7a. 7b. 7c

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SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:
Y The Licensee (has/has not) provide	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/ar will function who environmental service conditions.	ically stated that the equipment is en exposed to the applicable DBE
The Licensee has presented information outstanding qualification deficien	
The Licensee (has/has not) propose item whose qualification has not be	ed a corrective action for this equipment been fully established.
Justification for interim oper Licensee for this equipment it	ration (has/has not) been provided by the tem.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipme Verify qualification by ad Equipment relocation to a Qualification testing of e	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equip and/or should be exempted from env	ment item does not require qualification ironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA	TION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 o	
I.a Qualified I.b Modification	II.c Qualified Life Deficiency III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 536

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 177

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQ		DESIGNATION: = DEFICIENCY
Daniman	ted Evidence of Qualification Adequate	
Documen	e Similarity Between Equipment and Test Specimen Establish	ned X
Aging D	egradation Evaluated Adequately	ned
Aging D	ed Life or Replacement Schedule Established (If Required)	
Dragram	Established to Identify Aging Degradation	
Critari	a Regarding Aging Simulation Satisfied (If Required)	
Criteri	a Regarding Temperature/Pressure Exposure:	
CIICELI	Peak Temperature Adequate	
	Pesk Pressure Adequate	
	Duration Adequate	
	Required Profile Enveloped Adequately	
	Steam Exposure (If Required) Adequate	
	a Regarding Spray Sasisfied	
	a Regarding Submergence Satisfied	
	a Regarding Radiation Satisfied	
Critori	a Regarding Test Sequence Satisfied	
Critori	a Regarding Test Failures or Severe Anomalies	
	Any) Satisfied	
	a Regarding Functional Testing Satisfied	
Criteri	a Regarding Instrument Accuracy Satisfied	
Toot Di	ration Margin (1 hour + Function Time) Satisfied	
Criteri	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
		DESIGNATION:
NRC OUR	ALIFICATION CATEGORY	X = CATEGORY
1110 201		
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	-
II.a	Equipment Qualification Not Established	_X_
II.b	Equipment Not Qualified	X
II.c	Equipment Satisfies All Requirements Except Qualified Li	fe
	or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
TV	Documentation Not Made Available	

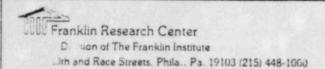
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 177

LICENSEE RESPONSE TO NRC SER

Moore
Eaton Corporation, Samuel Operations - Contract No. 821722

- a. Qualification is by tests as described in the following reports:
 - Isomedix Qualification Test for Samuel Moore & Company, dated June 1978. (LOCA)
 - Isomedix Qualification Test for Eaton Corporation, Samuel Moore Operations, dated January 1980. (MSLB)
- D. The test programs were based on the guidelines of IEEE 323-1974 and IEEE 383-1974. Aging was per the Arrhenius technique.
- The June 1978 (LOCA) cables were subjected to sequential exposures of thermal aging and radiation, followed by an exposure to a chemical spray environment for 30 days. Cables were aged for seven days at 121°C and then irradiated to an accumulated dose of 2x10° RADS. The chemical spray consisted of H₃BO3 (3000 ppm boron) and Na₂S₂O₃ buffered to a pM of 9.0 to 11.0. (Environmental condition profile in appendix 2).
- d. The January 1980 (MSLB) cables were subjected to sequential exposures of thermal aging and radiation, followed by an exposure to two environments of superheated steam. Cables were aged for seven days at 121°C and then exposed to superheated steam conditions shown in appendix 2.
- All conductors were energized during the entire exposure to LOCA and MSLB environments. Cables were tested before and after thermal aging.



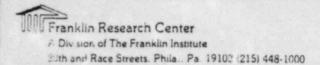
Page 5a

NOTES: The licensee has not provided sufficient information to establish that the Equipment described on the SCEW sheet is the same as the Equipment described in the referenced report.	
The licensee has not provided sufficient information to establish that the Equipment described on the SCEW sheet is the same as the Equipment described in the referenced report.	NOTES:
Equipment described on the SCEW sheet is the same as the Equipment described in the referenced report.	
in the referenced report.	The licensee has not provided sufficient information to establish that the
	Equipment described on the SCEW sheet is the same as the Equipment described
	in the referenced report.

A Division of The Franklin Institute 20th and Race Streets, Phila. Pa. 19103 (215) 448-1000 PRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 12
FRC Task No. ______

Page 55

Pagui vananna 6 111		
Requirements for establi	ishing similarity between i	nstalled and tested cables
are contained in the DOR	R Guidelines and IEEE 383-7	4 which are reproduced
below for convenience.		
2. Test Specimen	- The test specimen should be the same m	odel as the
equipment bei	ng qualified. The type test should only	be considered valid
for equipment	identical in design and material constru	ction to the test
specimen. An	y deviations should be evaluated as part	of the qualifica-
tion document	ation (see also Section 8.0 below).	
		ISIOC
	IEEE-383 1.3.1 Cable Description. This description or specification should include as a maximum: 1.3.1.1 Conductor — material identification, size, stranding, coating. 1.3.1.2 Insulation — material identification, thickness, method of application. 1.3.1.3 Assembly imulticonductor cables only) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes, extrusions, braids, or others. 1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application. 1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Spice or Connection Description or Both. This description or specification should include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembley. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.	
shot ers. -74. of ti lists sent leng	Type Test Samples. The samples tested iid contain the conductor, insulation, fill-packer, binder tape, overall jacket, shield-and field spices which are representative to cable category being qualified. Table 1 sizes which have been considered representative of these caregories. The sample the should be sufficient to permit reliable readings and evaluation considered with	



Page 5 C

	ELECTRIC CABLES, FIELD SPLIC	CES, AND CONNECTIONS		Std 382-1974
	Table 1 Represensentative Cables for Type Tests			
	Type	Test	Section	Size
	Up to 2000 V multiconductor control cable or Shielded multiconductor	temperature and moisture resistance	2.3.1	1.0 - 14 or 12 AWG
	signal cable (see list below for individual component) or	thermal and radiation	2.2.3	1/C or M/C -
	Single conductor power cable	design basis event simulation	2.4	14 or 12 AWG 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 1/C - 14 or 12 AWG
-		vertical cay flame test	2.5.4	7/C - 16, 14 or 12 AWG
	Shielded pairs, triple or Qual from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
	signal cable.	thermal and radiation	2.3.3	
		design basis event simulation	2.4	
	Coaxial, trianial or	vertical flame test	2.5 %	
-	special instrument cable	resistance - thermal and radiation	2.3.1	zctiai size
-		exposure design basis event simulation	2.4	
_		vertical flame test singles from caule assembly	2.5.6	
_	Single pair thermocruple 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	2.4	
		situalition vertical tray flaine test	2.5.4	
-		vertical flame test singles from cable assembly	2.5.6	
	2:101-15:000 V power cable 1/C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5kV) 2/O or 4/O or 4/O (2-15kV)

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 178

EQUIPMENT ITEM NO. 178

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

ANACONDA, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 178

LICENSEE REFERENCE(S): 6449

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA (FREP))

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-7-2

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	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3e, 3d
System Consideration Review	4a, 4b, 4c, 4d, 4e, 4£
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5£, 5g, 5h, ∮i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	<u>6a, 6b</u>
Maintenance and Replacement Schedule Summary	7a, 7b, 7c

A Division of The Franklin Institute 20th and Race Streets, Phila. Pa. 19103 (215) 448-1000

Page

SUMMARY OF LICENSEE RESPONSES TO THE N	RC SER - ONLY CHECKED ITEMS ARE APPLICABLE
	d a response to the SER concerns.
The Licensee (has/hac not) specifi qualified and/or will function whe environmental service conditions.	
The Licensee has presented informa outstanding qualification deficient	
The Licenses (has/has not) propose item whose qualification has not b	d a corrective action for this equipment een fully established.
Justification for interim oper Licensee for this equipment it	ation (has/has not) been provided by the em.
Corrective action specified by	the Licensee:
Equipment replacement with Equipment modification	qualified equipment
Equipment relocation above	submergence level
Relocate or shield equipme	nt from radiation source
	ditional (testing/analysis)
Equipment relocation to a	
Qualification testing of e	quipment in progress
that can be construed as a bas operation. The Licensee (has/has not) pro-	r information for this equipment item is for justification for interim wided a schedule for the proposed for accomplishing the corrective
The Licensee states that the equipment and/or should be exempted from env	ment item does not require qualification ironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICA	TION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 o	
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. 178

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REC	QUIREMENTS	DESIGNATION: X = DEFICIENCY
Documen	nted Evidence of Qualification Adequate	ished -
Adequat	te Similarity Between Equipment and Test Specimen Establ	ished
Aging I	Degradation Evaluated Adequately ied Life or Replacement Schedule Established (If Require	d)
Qualifi	Established to Identify Aging Degradation	
Program	ia Regarding Aging Simulation Satisfied (If Required)	
Criteri	la Regarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	-
	Required Profile Enveloped Adequately	
0	- (ac a / - 1) (1 1)	
	La Regarding Spray Satisfied	
	ia Regarding Submergence Satisfied	
	ia Regarding Radiation Satisfied	
Criter	ia Regarding Test Sequence Satisfied	
Criter	ia Regarding Test Failures or Severe Anomalies Any) Satisfied	
Criteri	a Regarding Functional Testing Satisfied	
Criter	ia Regarding Instrument Accuracy Satisfied	
Test D	uration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
NRC QUA	ALIFICATION CATEGORY	DESIGNATION: X * CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	-57
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified	Lite
	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	

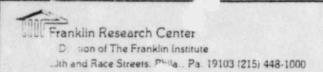
Page 3a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 178

LICENSEE RESPONSE TO NRC SER

Anaconda - Contract 87232

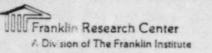
- a. Qualification is by test as described in Franklin Institute Report F-C4836-3.
- b. The test program was based on IEEE 383-1974 and IEEE 323-1974.
- c. The test included aging at 159° C for 168 hours, gamma irradiation to 2×10^8 rads and combined steam line break and LOCA events. During LOCA and SLB testing cables were elelctrically energized.
- d. After aging and irradiation, the cables were exposed to a chemical spray consisting of H₃BO₃ (6200 ppm boron) and NH₂NH₂ buffered to a pH of 8.1 - 10.0. (Environmental condition profile in appendix 2).
- e. Cables were tested before and after thermal aging.
- f. MSLB/LOCA test environments are shown in Appendix 2. The specimens were electrically loaded and tested during simulation test.
- g. Further testing and inspection were performed after testing.
- h. It is concluded from the above tests and using the Arrhenius technique that all cables will function for at least 40 years at a continuous operating temperature of 90°C and that all cables will perform satisfactorily during and after MSLB-LOCA DBA's.
- It is concluded that the main steam line break test profile was more severe than the profile required by the generic envelope shown in Appendix C of NUREG 0588.



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NOTES: The licensee has not provided sufficient information to establish that the
The licensee has not provided sufficient information to corellish that all
The free has not provided sufficient information to establish that the
Equipment described on the SCEW sheet is the same as the Equipment describe
in the referenced report.
[
나는 하는 사람들이 가는 사람들이 되었다면 하는 것이 되었다면 하는 것이 없는 것이 없는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하

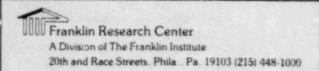
NOTES:		
Requirements for establishments	shing similarity between in	stalled and tested cables
are contained in the DOR	Guidelines and IEEE 383-74	which are reproduced
below for convenience.		
equipment bein for equipment specimen. Any	- The test specimen should be the same mog qualified. The type test should only be identical in design and material constructions should be evaluated as part of tion (see also Section 8.0 below).	e considered valid
	(0	75100
	1.3.1 Cable Description. This description or specification should include as a minimum: 1.3.1.1 Conductor — material identification. size, stranding, coating. 1.3.1.2 Insulation — material identification, thickness, method of application. 1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders. 1.3.1.4 Shielding — tapes, extrusions. — braids, or others. 1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application. 1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable. 1.3.1.7 Identification — manufacturer's trade name, catalog number. 1.3.2 Field Splice or Connection Description or Both. This description or specification should include as a minimum: 1.3.2.1 Whether factory or field assembled to cable. 1.3.2.2 Conductor connection — type, material identification, and method of assembly. 1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.	
shot ers. ing. of till lists sent leng test	Type Test Samples. The samples tested and contain the conductor, insulation, fill-incher, binder tape, overall jacket, shield-and field spikes which are representative to cable category being qualified. Table 1 sizes which have been considered representative of these categories. The sample the should be sufficient to permit reliable readings and evaluation consistent with itesting practice.	



A Division of The Franklin Institute
20th and Race Streets. Phila. Pa. 19103 (215) 448-1000

Page 5 C

	ELECTRIC CABLES, FIELD SPL	CES, AND CONNECTIONS		Std 382-197
	Table 1 Represensentative Cal·les for Type Tests			
	Туре	Test	Section	Size
S	Up to 2000 V multiconductor control cable or Shielded multiconductor	temperature and moisture resistance	2.3.1	1/C - 14 or 12 AWG
11	ignal cable (see list below for ndividual component) or Single conductor power cable	thermal and radiation	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 1/C - 6, 4 or 2 AWG
		vertical flame test singles from cable assembly	2,5,6	1/C - 14 or 12 AWG
5	hielded pairs, triple or	vertical trav flame test	2.5.4	7/C - 16, 14 or 12 AW
9	tad from multiconductor	temperature and moisture resistance thermal and radiation exposure	2.3.1	1 pair shielded 16 AWG or actual cable
		design balls event simulation	2.4	
-	Committee of the commit	vertical fiame test	2.5.6	
	oaxial, triaxial or pecial instructent cable	temperature and moisture resistance thermal and radiation	2.3.1	actual size
		exposure design basis event simulation	2.4	
		vertical flame test singles from cable 152-mbiy	2.5.6	
	ngle pair thermocruple stension cable	temperature and moisture resistance thermal and radiation	2.3.1	2/C - 20 AWG or actual size if smaller
		exposure design basis event	2.3.3	
		simulation vertical tray claime test	2.5.4	
		vertical flame test singles from cable assembly	2.5.6	
	001-15 000 V power cable C triplexed and multiconductor	vertical tray flame lest	2.5.4	6 AWG (2·5kV) 2/O or 4/O or 4/O (2·15kV)



NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 526

Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 179

EQUIPMENT ITEM NO. 179

LIMIT SWITCH LOCATED IN THE ANNULUS

NAMCO MODEL EA170

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 179

LICENSEE REFERENCE(S): 1530, 4752

FUNCTION (PLANT ID): POSITION INDICATION (2-ZS-30-46, -47, -48; FCV-81-12) LICENSEE SUBMITTAL: SCEW(S): EEB-1058 (3.11-5 PAGE 6, 3.11-8-2 PAGE 3)

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,

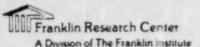
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Form	s 2
Licensee Response to NRC SER	3a, 3b, 30, 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-

Page 1b

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/hes not) provide	ded a response to the SER concerns.
The Licensee (has/has not) specification will function will environmental service conditions.	fically stated that the equipment is then exposed to the applicable DBE
The Licensee has presented informoutstanding qualification deficient	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
Justification for interim open Licensee for this equipment in	eration (has/has not) been provided by the item.
Corrective action specified b	by the Licensee:
Equipment replacement wit	
Equipment relocation above	
	ment from radiation source
Verify qualification by a Equipment relocation to a	mild environment
Qualification testing of	
Other ()
that can be construed as a ba operation. The Licensee (has/nas not) pr	er information for this equipment item sis for justification for interim
corrective action. (Schedule action	for accomplishing the corrective
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
SIGNATION OF RESULTANT NRC QUALIFIC	ATION EVALUATION CATEGORY BASED ON REVIEW
CIRCLED ITEM ONLY: (See Section 3	of this TER for Legend)
a Qualified	II c Qualified Life Definions
b Modification	II.c Qualified Life Deficiency III.a Exempt
.a Qualification Not Established	III.b Not in Scope
.b Not Qualified	IV Documentation Not Available



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. _____526

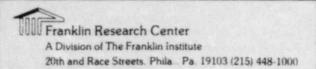
Page 2

NRC REC		DESIGNATION: = DEFICIENCY		
	ted Evidence of Qualification Adequate			
dequat	e Similarity Between Equipment and Test Specimen Establish	hed		
aging D				
qualifi				
	Established to Identify Aging Degradation			
Criteri	a Regarding Aging Simulation Satisfied (If Required)	\equiv		
Criteri	a Regarding Temperature/Pressure Exposure:			
0	Peak Temperature Adequate	×		
0	Peak Pressure Adequate			
0	Duration Adequate			
0	Required Profile Enveloped Adequately			
0	Steam Exposure (If Required) Adequate	_X_		
Criteri	a Regarding Spray Satisfied			
Criter	a Regarding Submergence Satisfied			
Criteri	X			
Criteria Regarding Test Sequence Satisfied				
Criteri	a Regarding Test Failures or Severe Anomalies			
(If)	ny) Satisfied			
Criteri				
	a Regarding Instrument Accuracy Satisfied	\equiv		
	ration Margin (1 hour + Function Time) Satisfied			
Criter:	a Regarding Margins Satisfied (NUREG-0588, Cat. I)			
		DESIGNATION		
NRC QUI	ALIFICATION CATEGORY	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 Li or Replacement Schedule Justified	fe		
III.a	Equipment Exempt From Qualification			
	Equipment Not in the Scope of the Qualification Review			
III.b	Eduthment wor in the scope of the Addition verses	-		

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____526

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NOTES:
of qualification for this equipment iten the beine states they all the limits witches are subject to a DBE, or HAB
Al analisation do Ris law med to the President to the
of quarification for one of the first of the formation of
all the limits witches are subject to a DBE, or HAB
provionment. The model EA 170 was orminmentally tested
for rabation, Thermal aging, seismic, and mechanish
aging Notestingis reported for simulation of HELB or
100 0:+ New A Aministration
Loca condition. Therefore, The Device is assigned to
category It a " qualification pot Established".



Page

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 180

EQUIPMENT ITEM NO. 180

LIMIT SWITCH LOCATED IN VARIOUS LOCATIONS

NAMCO MODEL EA-170

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 180

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POSITION INDICATION (2-FCV-63-72, -73; 2-FCV-81-12;

2-PCV-68-334, -340A)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-44

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,

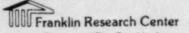
Not stated, Not applicable

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-

Page

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provide	and a response to the SER concerns.
	fically stated that the equipment is nen exposed to the applicable DBE
The Licensee has presented informoutstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	sed a corrective action for this equipment been fully established.
	eration (has/ has not) been provided by the item.
X Corrective action specified	by the Licensee:
	re submergence level ment from radiation source additional (testing/analysis)
Qualification testing of Other (
	ner information for this equipment item asis for justification for interim
	ovided a schedule for the proposed for accomplishing the corrective.
The Licensee states that the equi and/or should be exempted from en	pment item does not require qualification vironmental qualification.
	CATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3	or this TEX for Legend)
I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	
II.b Not Qualified	IV Documentation Not Available



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. 5 2 6

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 180

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified III.a Equipment Exempt From Qualification III.b Equipment Not in the Scope of the Qualification Review

Documentation Not Made Available

IV

NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. _____ 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. (SO

LICENSEE RESPONSE TO NRC SER

Summary

The EA-170-100 (92400X) components listed above may be exposed to the harsh environment resulting from a LOCA or HELB. According to the attached letter from Kantner to Stefanek, these limit switches are "suitable for use in an ambient of 90 C, but is not suitable for other than a general use, and (not for) unusual environmental conditions. This switch has been seismically qualified...".

The EA-170-302 components listed above are inside containment (excluding the EA-170-302 on FCV-8:-12, which is outside). EA-170-302 "are suitable for use in areas outside of the containment...", according to the same letter. They are not qualified for use inside containment per NUREG 0588 requirements.

Accordingly, all the components listed in Appendix 1 (excluding EA-170-302 on FCV-81-12) are to be replaced. The information below provides interim qualification justification for continued operation until these components can be replaced, approximately June, 1982. Interim qualification is based on safety evaluation NEB 810609 259 and equipment qualification work beyond the attached letter as discussed below.

EA-170-100 Inside Containment - Interim Qualification

The following are inside containment:

Limit switches on...FCV-62-69... FCV-62-70 1-PCV-68-334 1-PCV-68-340A Zone switches on... ZS-63-67 ZS-63-80 ZS-63-98 ZS-63-118

FCV-62-69 and -70 limit switches can fail in a manner that would cause the associated valve to take inappropriate action. However, the safety evaluation shows that redundant signals elsewhere and/or redundant valves will accomplish the necessary safety function.

The remaining six switches do not affect valve positions, according to the safety evaluation, but do affect status as reported in the control room. The major hazard is, therefore, that the operator will take inappropriate action based on this information. However, other qualified equipment is available to provide correct information.

- EA-170-302 on FCV-81-12 is addressed in EQS NEB-81-41.
- •• FCV-62-70 is subject to submergence.

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Page 3b

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 150

LICENSEE RESPONSE TO NRC SER (Continued)

EA-170-100 Outside Containment - Interim Qualification

The other EA-170-100 switches in Appendix 1 are outside containment. Only FCV-68-307 is located in the annulus. The safety evaluation (NEB 810609 259) shows that switch failure does not cause this valve to take inappropriate action, but only affects indicating lights in the control room. The other EA-170-100 switches outside containment are located in the auxiliary building either in individually cooled room, in general spaces, and/or at node locations 2, 15, or 17. The qualification of limit switches against the worst of these conditions is discussed below.

- a. Temperature, Pressure, and Humidity: Maximum accident temperature is. 215 F, only 21 F higher than the 90 C (194 F) quoted by the NAMCO letter. Maximum accident pressure is 1.6 psig, not significantly different than normal atmospheric pressure. Maximum humidity is 100%; however, the switches are enclosed in NEMA 4 enclosures (see letter) which will protect against humidity for the short term when operation is critical.
- b. Radiation: Maximum accident radiation is 1 x 10 rads integrated dose. No data are available to TVA to evaluate whether the switch could be qualified for such exposure. However, the EPRI Equipment Qualification Data Bank shows that radiation qualification has been done (assumed to be all by analysis) by Nebraska Public Power of Cooper 1 (2 x 10°), by Carolina Power and Light on Brunswick 1 and 2 (1 x 10°), and by Portland General Electric on Trojan 1 (8 x 10°). (Normal radiation, to be added to the accident is negligible, being 1 x 10° rads for 40 year life. Recall these components will replaced shortly, thus seeing a fraction of 1 x 10 .)
- c. Operating Time: No data are available regarding time the equipment is capable of operating at accident conditions.
- d. Chemistry (Caustic Spray), Submergence, Dust, Accuracy: Not applicable.
- e. Aging: In view of previous applications of these types of switches in normal environments, and of the short time before replacement, aging is not an issue.
- f. Margin: The data above indicate that for some components and for some conditions, "qualified conditions" fall short of predicted conditions, however, qualification is reasonably close to predicted conditions, which adds to the confidence that the equipment will survive. Furthermore, all components exposed to the most severe conditions (i.e. node locations 2 and 17) were shown by the referenced safety evaluation not to present an unacceptable safety hazard if they were to fail.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 150

LICENSEE RESPONSE TO NRC SER (Continued)

EA-170-302 Inside Containment - Interim Qualification

EA-170-302 limit switches are discussed in EQS's NEB-87-45 and NEB-81-41 for use outside containment. Although these latter EQS's (Revisions 0) are in process, it is evident that the switches are qualified (or perhaps qualified except for relatively minor deviations from NURES 0588), for use outside containment. That discussion will not be repeated here. Rather, differences between conditions outside and inside the lower containment compartment, where 2-PCV-68-334 and -340A are located, are discussed.

Qualified radiation exposure (2 x '0 rad) exceeds requirements (1 x 10 accident + 2 x 10 normal 40 year rad) for inside containment service. Qualification testing for pressure, and temperature did not cover in-containment conditions, therefore, there is no assurance that they can be qualified. (Test conditions were 1 Atm/200 P versus required 12 psig/327 P.) Chemistry (caustic spray) and humidity may be most because of the NESA 4 enclosures provided.

Because potential accident temperature and pressure are significant extrapolations beyond tested conditions, NZB 810609 259 addressed potential failures of these components. It was found that the switches only control the valve position indicating lights in the control room and failure will not affect valve position. Furthermore, alternative qualified monitors will be available to provide accurate information.

Conclusions

The limit switches in Appendix 1 cannot now be qualified per NUREG 0588 and are to be replaced. Interim operation is justified, based on the above information, because:

- a. The equipment is partially qualified, and there is no evidence to show positively that the equipment will not survive long enough to perform its safety function,
- b. safety analysis for the most questionable components shows that failure would be mitigated by alternative indicators and/or safety equipment,
- c. Margin is provided in predicted accident conditions such that actual conditions would not be as high, and therefore, there is more assurance of proper safety response by these components, and
- d. probability is diminishingly small that a design basis event will occur in the short time when the equipment is to remain in place.

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 181

EQUIPMENT ITEM NO. 181

LIMIT SWITCH LOCATED IN ANNULUS

NAMCO MODEL EA700

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 181

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POSITION INDICATION (FCV-32-81, -103, -111)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1053-2 (3.11-5-2 PAGE 1)

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

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

Not stated, Not applicable

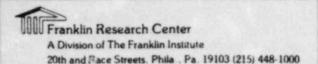
LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	la
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	Aar 4br 4c, 4d, 4e, 4£
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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SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has net) provided a response to the SER concerns.
The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
The Licensee has presented information which shows there are no outstanding qualification deficiencies.
X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
Y Justification for interim operation (has/bas 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 (
that can be construed as a basis for justification for interim operation.
The Licensee (has/nas 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 STEM ONLY: (See Section 3 of this TER for Legend)
I.a Qualified II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope II.b Not Qualified IV Documentation Not Available



Page 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 181

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualification Pending Modification I.b II.a Equipment Qualification Not Established II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b

Documentation Not Made Available

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 181

LICENSEE RESPONSE TO NRC SER

Sheet No. EEB-1053-2 Revision 1 Appendix 2 Sheet 1 of 1

The limit switches are required to operate in the following environment:

Temperature:

150°E

Pressure:

Atmospheric

Relative Humidity:

100%

Radiation:

40 year TID - 2 x 107 RADS Accident - 5 x 107 RADS

RI

The manufacturer's specifications for the limit switches are as follows:

Temperature:

1940F

Pressure:

Atmospheric NEMA 4 Enclosure

Relative Humidity: Radiation:

Not Specified

See generic position 4.1.8 for relative humidity.

Available documentation indicates that the limit switches are not qualified for their radiation environment. Switches will be replaced as determined by the resolution of NCR SQNEEB8102.

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FRC Task No. 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 182

EQUIPMENT ITEM NO. 182

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA700

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 182

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POSITION INDICATION (ZS-67-217, -219, -336, -338)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1059-2 (3.11-7-2 PAGES 1, 2; 3.11-8-2 PAGE 1)

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

R. T. 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	la
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, 5e, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	-6a, 6b-

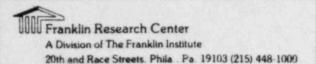
Maintenance and Replacement Schedule Summary

-7a, 7b, 70-

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 182

SUMMARY OF LICENSEE RESPONSES TO THE	NRC JER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has/has not) provid	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
The Licensee has presented inform outstanding qualification deficie	
X The Licensee (has/has-not) proposites whose qualification has not	ed a corrective action for this equipment been fully established.
_X Justification for interim ope Licensee for this equipment i	ration (has/h es not) been provided by the tem.
X Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment Verify qualification by acceptance of the companion o	e submergence level ent from radiation source dditional (testing/analysis) mild environment
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from environment	pment item does not require qualification vironmental qualification.
	ATION EVALUATION CATEGORY BASED ON REVIEW
- CIRCLED ITEM ONLY: (See Section 3 of	of this TER for Legend)
I.a Qualified I.b Modification II.a Qualification Not Established	II.c Qualified Life Deficiency III.a Exempt III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available



IV

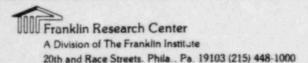
Documentation Not Made Available

NRC Contract No. NRC-03-79-113
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 526

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 182

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM DESIGNATION: X = DEFICIENCY NRC REQUIREMENTS 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 Equipment Qualification Pending Modification I.b Equipment Qualification Not Established II.a II.b Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Life II.c or Replacement Schedule Justified Equipment Exempt From Qualification III.a Equipment Not in the Scope of the Qualification Review III.b



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 182

LICENSEE RESPONSE TO NRC SER

Sheet No	<u> </u>
Revision _	1
Appendix _	3
Sheet 1 of	1

The limit switches are required to operate in the following environment:

121°F Temperature: Acmospheric Pressure:

Relative Humidity: 100% Radiation:

40 year TID - 3.51 x 102 rads Accident - 1.0 x 104 rads

The manufacturer's specifications for the limit swtiches are as follows:

194°F Temperature: Atmospheric Pressure:

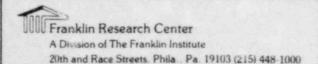
Relative Humidity: NEMA 4 Enclosure Not Specified Radiation:

The temperature and pressure environment in which the switches are located is less severe than the manufacturor's specifications. See generic positions 4.1.8 for relative humidity and 4.1.5 for radiation.

The above information provides adequate justification for continued operation. However, due to the lack of qualification documentation TVA will replace these switches with a qualified replacement.

RT

R1



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 183

EQUIPMENT ITEM NO. 183

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL 206-381

REQUIRED OPERATING TIME: 30 DAYS

TER CHECKSHEET NO. 183

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT HYDROGEN MONITORING (2-FSV-43-207, -208)

LICENSEE SUBMITTAL: SCEW(S): EEB-1020

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	5 a, 5b, 5c, 5d, 5e, 5£, 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. 183

SUMMARY OF LICENSEE RESPONSES TO THE	NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE
X The Licensee (has	ed a response to the SER concerns.
The Licensee (has/has not) specific qualified and/or will function when environmental service conditions.	
X The Licensee has presented inform outstanding qualification deficie	
The Licensee (has/has not) propositem whose qualification has not	ed a corrective action for this equipment been fully established.
Justification for interim ope Licensee for this equipment i	ration (has/has not) been provided by the tem.
Corrective action specified by	y the Licensee:
Equipment replacement with Equipment modification Equipment relocation above Relocate or shield equipment	e submergence level
Verify qualification by ac Equipment relocation to a	dditional (testing/analysis) mild environment
Qualification testing of (equipment in progress
	er information for this equipment item sis for justification for interim
	for accomplishing the corrective
The Licensee states that the equipand/or should be exempted from en	oment item does not require qualification vironmental qualification.
DESIGNATION OF RESULTANT NRC QUALIFICATION OF CIRCLED ITEM ONLY: (See Section 3 of	ATION EVALUATION CATEGORY BASED ON REVIEW of this TER for Legend)
1.a Qualified 1.b Modification	II.c Qualified Life Deficiency
II.a Qualification Not Established II.b Not Qualified	III.b Not in Scope IV Documentation Not Available

NRC Contract No. NRC-63-79-118
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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 183

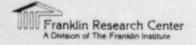
		DESIGNATION:
IRC REQ	<u>UIREMENTS</u>	= DEFICIENCY
ocumen	ted Evidence of Qualification Adequate	
dequat	e Similarity Between Equipment and Test Specimen Establis	shed
ging D	egradation Evaluated Adequately	
ualifi	ed Life or Replacement Schedule Established (If Required)	
rogram	Established to Identify Aging Degradation	
riteri	a Regarding Aging Simulation Satisfied (If Required)	
riteri	a Ragarding Temperature/Pressure Exposure:	
	Peak Temperature Adequate	
	Peak Pressure Adequate	
	Duration Adequate	
0	Required Profile Enveloped Adequately	
0	Steam Exposure (If Required) Adequate	
	a Regarding Spray Satisfied	
	a Regarding Submergence Satisfied	
riteri	a Regarding Radiation Satisfied	
Criteri	a Regarding Test Sequence Satisfied	
Criteri	a Regarding Test Failures or Severe Anomalies	
	any) Satisfied	
	a Regarding Functional Testing Satisfied	
Criter	a Regarding Instrument Accuracy Satisfied	-
Test Du	ration Margin (1 hour + Function Time) Satisfied	
Criter	ia Regarding Margins Satisfied (NUREG-0588, Cat. I)	
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	Equipment Qualified	_X
I.a	Equipment Qualification Pending Modification	_ <u>x</u>
I.a I.b	Equipment Qualification Pending Modification Equipment Qualification Not Established	_ <u>x</u>
I.a I.b II.a	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified	
I.a I.b II.a II.b	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified L:	
I.a I.b II.a II.b	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Li or Replacement Schedule Justified	
I.a I.b II.a II.b	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Li or Replacement Schedule Justified Equipment Exempt From Qualification	
I.a I.b II.a II.b III.c	Equipment Qualification Pending Modification Equipment Qualification Not Established Equipment Not Qualified Equipment Satisfies All Requirements Except Qualified Li or Replacement Schedule Justified	

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.

Because they were prepared in accordance with Appendix E of NUREGO-0588, the Licensee's submittals were not in the format prescribed in IE Bulletin 79-01B; that is, no SCEW sheets were provided. In general, this resulted in inadequate and incomplete descriptions of the equipment which would permit an independent reviewer to determine that the test reports cited provided evidence of qualification for the installed equipment. If the Licensee can establish applicability either by detailed description of the installed equipment compared to the equipment tested or obtain certification from the manufacturer that the test report applies to the installed equipment, much of the equipment assigned to Category II.A would be qualified. In addition, the Licensee provided no evaluation of test data contained in the report, particularly of instrument accuracies, changes in cable characteristics, or preaging of equipment. The Licensee should ensure that such evaluations are performed.



With regard to Limitorque operators that were listed in the NRC's SER [10], two items were addressed by the Licensee, but listings were not found in the Master List tables in the submittal. These were listed as:

	Manufacturer	Plant ID	SER Deficiency	Licensee Response
1.	Unknown	FCV 61-97	CS, RT, QT, R, T, P, M, A, H, QM, QI	Replace
2.	Limitorque	LCV 3-148	QT, T, P, H, A, R, M, QM	Address in next submittal

The above information is placed here since these items could not be addressed in Section 4 of this TER.

Some of the Licensee's evaluations of qualification documents attempted to extrapolate accident simulation periods through the use of Arrhenius techniques. The Licensee is cautioned that use of Arrhenius methodology may not be technically justifiable since existing Arrhenius methodology is based upon oxygen-rich, no-pressure, no-steam environments. The prime aging reactions of concern involve oxygen. In general, oxygen is exhausted from LOCA/HELB chambers at the onset of the simulation. The use of Arrhenius methodology has not been proven as applicable to nonoxygenated, pressurized, high humidity environments.

The Licensee did not provide any identification of TMI Action Plan equipment.

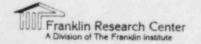
6. REFERENCES

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.

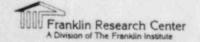
PLANT-SPECIFIC REFERENCES

- G. Lainas
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 Equipment Environmental Qualification
 USNRC, 19-Feb-80
- Environmental Qualification of Electrical Equipment USNRC/IE, 14-Jan-80 IEB 79-01B
- Environmental Qualification of Class 1E Equipment USNRC, 29-Feb-80 IEB 79-01B, Supp. 1
- 4. N. C. Moseley
 Letter to B. H. Grier et al., NRC. Subject: Supplement
 No. 2 to Bulletin 79-01B, Environmental Qualification of
 Class 1E Equipment
 USNRC, 29-Sep-80
- N. C. Moseley
 Letter to B. H. Grier et al., NRC. Subject: Supplement
 No. 3 to Bulletin 79-01B, Environmental Qualification
 of Class 1E Equipment
 USNRC, 24-Oct-80
- S. J. Chilk
 Memorandum and Order Pursuant to Union of Concerned
 Scientists Petition for Emergency and Remedial Relief
 USNRC, 23-May-80
 CLI-80-21
- 7. D. G. Eisenhut
 Letter to All Power Reactor Licensees, Applicants, Vendors
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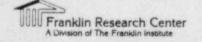


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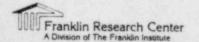
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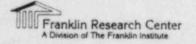
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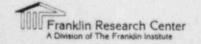
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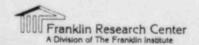
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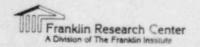
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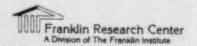
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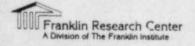
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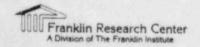
APPENDIX A - ENVIRONMENTAL SERVICE CONDITIONS

The specific environmental service conditions corresponding to different plant locations that were used in this technical evaluation are stated in this appendix, based upon the information presented in the Licensee's submittals [5, 11].

The temperature and pressure profiles contained herein form the basis for the temperature and pressure noted by the Licensee in the "Environment Required" column on the Licensee's Equipment Qualification Report Evaluation sheets.

This appendix contains the following curves and tables:

- Table A-1. Summary of Operational Environmental Conditions
- Table A-2. Accident Radiation Doses for Plant Areas and Miscellaneous Mechanical Equipment
- Figure A-1. Definition of Service Conditions for Normal and Abnormal Environments
- Figure A-2. HELB Node Definition, Elev. 653.0
- Figure A-3. HELB Node Definition, Elev. 669.0
- Figure A-4. HELB Node Definition, Elev. 690.0
- Figure A-5. HELB Node Definition, Elev. 714.0
- Figure A-6. HELB Node Definition, Elev. 734.0
- Figure A-7. HELB Node Definition, Elev. 749.0
- Figure A-8. SQN Auxiliary Building, Nodal Diagram (Flow Areas in Ft2)
- Figure A-9. SQN Auxiliary Building, HELB Temperature vs. Time, Corridor Elev. 653, Node 1 (Transient in Node 18 Similar)
- Figure A-10. SQN Auxiliary Building, HELB Temperature vs. Time, RHR Pump Room, Node 2
- Figure A-11. SQN Auxiliary Building, HELB Temperature vs. Time, Corridor Elev. 669, Node 3
- Figure A-12. SQN Auxiliary Building, HELB, Corridor Elev. 669, Node 4, Temperature vs. Time



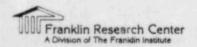
- Figure A-13. SQN Auxiliary Building, HELB, Auxiliary Feedwater Pump Turbine Room, Node 5, Temperature vs. Time
- Figure A-14. SQN Auxiliary Building, HELB, BA/Gas Stripper Room, Elev. 669, Nodes 6 and 7, Temperature vs. Time
- Figure A-15. SQN Auxiliary Building, HELB, Temperature vs. Time, Corridor Elev. 690, Node 8
- Figure A-16. SQN Auxiliary Building, HELB, Temperature vs. Time, Corridor Elev. 690, Node 9
- Figure A-17. SQN Auxiliary Building, HELB, RHR Hx Room, Node 10, Temperature vs. Time
- Figure A-18. SQN Auxiliary Building, HELB, Letdown Hx Room, Node 11, Temperature vs. Time
- Figure A-19. SQN Auxiliary Building, HELB, Open Area Elev. 714, Node 12, Temperature vs. Time
- Figure A-20. SQN Auxiliary Building, HELB, Pipe Chase. Node 17, Temperature vs. Time
- Figure A-21. SQN West Valve Vault, HELB, Pressure vs. Time, Temperature vs. Time
- Figure A-22. SQN East Valve Vault, HELB, Pressure vs. Time, Temperature vs. Time.
- Figure B.1-1. Containment Pressure Double Ended Pump Suction Break
- Figure B.1-2. Containment Temperature Double Ended Pump Suction Break
- Figure B.1-3. Containment Temperature Versus Time for the Most Severe Steam Line Break

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 the development of environmental service conditions was stated in the Licensee's submittal [5]:

"3. Service Conditions

The environmental conditions present in plant areas that can impact safety-related equipment have been established. The following categories were used to bound anticipated plant conditions.



- 1. Normal The temperature, pressure, humidity, and radiation ranges that are expected to be present when the plant is in any of the technical specification modes of operation.
- Abnormal Conditions that could exist as a result of infrequent events such as a loss of offsite power.
- 3. Accident Environmental conditions that would be experienced as a result of high energy pipe breaks outside containment, or a large, intermediate or small LOCA or main steam line break inside containment.

All analyses performed to determine the service conditions are in accordance with either TVA quality assurance procedure EP 3.03 or Westinghouse's internal quality assurance program.

3.1 Inside Containment

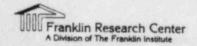
3.1.1 High Energy Line Breaks

The controlling breaks inside containment are a double-ended guillotine rupture in a pump suction leg of the reactor coolant system (RCS) and a small slot break in the main steam line. The large LOCA is controlling for pressure and long term temperature response. The small steam line break produces the most severe short term temperature transient. The pressure and temperature response for the large LOCA is provided in figures 3.1-1 and 3.1-2 and the temperature response for the worst case steam line break is shown in figure 3.1-3. The containment pressure and temperature response to the LOCA was evaluated with the LOTIC computer code using mass and energy releases calculated as discussed in Westinghouse topical reort WCAP-8312A. LOTIC III was used to evaluate the containment response to main steam line breaks. Mass and energy releases were calculated using the methods discussed in Westinghouse topical report WCAP-8822. Details of the analyses including mass and energy release rates, initial conditions, and general assumptions are provided with results in FSAR section 6.2 and FSAR questions 6.56 and 6.56A.

3.1.2 Chemical Spray

The chemical composition of the containment spray was based on the following solutions which resulted in the most severe service conditions:

Ice Condenser - quantity of ice - 2.4 x 10⁶ pounds Boron - 1800 ppm boron (as Na₂B₄O₇)



- Boron Injection Tank volume 900 gal. boron 20,000-22,500 ppm (as N₃BO₃)
- Safety Injection System (4 tanks) volume (each) 925 1015
 Ft³, boron 1900-2100 ppm (as H₃BO₃)
- 4. Upper Head Injection volume 850 ft3, boron 2100 ppm (as H₃BO₃)
- Refueling Water Storage Tank volume 323,100-331,000 gal boron - 2000-2100 ppm (as H₃BO₃)
- Reactor Coolant System volume 11,892 ft³, boron 0-2000 ppm (as H₃BO₃)

The following assumptions were used in this analysis:

- Calculations based on minimum quantities (wt or vol) maximum concentration.
- Complete ice melt with borax completely hydrolyzed. The density of borated ice is assumed equal to unborated ice.
- 3. All solutions including completely melted ice mix completely.
- 4. Density of borated water is equal to that of water.
- 5. Fission products, corrosion products, etc., will be neglected.

Results - The solutions stated above yields a resulting concentration of 0.1847 Molar H₃BO₃ (2000 ppm boron), 0.033 Molar HaOH resulting in a ph of 8.2. The methodology used above meets the caustic spray solution guidelines in SRP Section 6.5.2, paragraph II, item e, and reflects the worse case conditions.

3.1.3 Radiation

The normal operating dose rate and 40 year integrated dose were taken from FSAR table 3.11-2 (revised by amendment 62; October 31, 1979). [Licensee Tables 3.11-2 and 3.11-2A correspond to Tables A-1 and A-2 of this TER.] The radiation exposure inside containment after a design basis LOCA was calculated based on a release to the containment atmosphere of 100 percent of the core inventory of noble gas, 25 percent of the core inventory of iodine, and 1 percent of the core inventory of solid fission products (equivalent to TIC-14844 releases). Removal of iodine is assumed to be due to interaction with the ice condenser only. The calculation of activity in containment after a LOCA is described in FSAR Section 15.5. Maximum gamma doses were calculated in the upper compartment, lower compartment and ice condenser using a

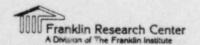


Table A-1. Summary of Operational Environmental Conditions

TABLE 3,11-2 SUMMARY OF OPERATIONAL ENVIRONMENTAL CONDITIONS

Plant Location		perational ondition	Pressure Extreme (PSIA)	Peak Temperature	Peak Humidity (%)	Normal Dose Rate (mead/hr)	Integrated 40 Yr Dose (Rads)	Analytical Reference in FSAR
Outside	Yard areas	2	ATH	97	100	41.0	€5×10 ²	Sect 2.3
		3	11.4	NA	NA	NA.	MA	Sect 3.9
Containment	Upper compt	1	ATH	110	98	NA 3	5x10 ⁵	Sect 9.4.8
		5 2	26.4 (Note I)	170 (Note I)	100	NA	NA	Sect 6.2.1
		6	25.2	140 (Note H)	100	NA .	NA	Note H
	Ice condensar	1	ATM	15	100	5x104	2x10 ⁷	Sect 6.5
		5	26.2	170	100	NA .	NA	Sect 6.5
	Lower compt	- 1	MTM	120	98	5x10"	2x10	Sect 9.4.8
		5 2	6.4 (Note I)	244 (Note I)	100	NA	NA	Sect 6.2.1
		6 2	5.2 (Note H)	327 (Note H)	100	NA	NA	Note H
	All compts	4	13.9	NA	NA	NA B	NA 7	Sect 6.2.6
Shield Bldg	Annulus	1	ATH*	120	98	5x10"	2x10 ⁷	Sect 6.2.3
		3	ATM	NA	NA	NA	MA	Sect 3.3
		4	12.4	NA	NA	NA	NA	Sect 6.2.6
		5	ATM*	150	100	NA	NA 2	Sect 6.2.3
Auxiliary	General spaces	1	ATH#	104	98	1.0	5.102	Sect 9.4.2
bldg		5 .	ATH*	115	100	NA	NA	Sect 6.2.3
		7	Note G	Note G	100	HA 3	NA ₆	Sect 9.4.2
	Individually	1	ATH*	104	98	2x103	100	Sect 9.4.2
	cooled rooms	5	ATM*	110	100	NA	NA	Sect 9.4.2
		7	Note G	Note G	100	NA	NA 2	Sect 9.4.2
	Board rms, aux con		ATH	75	50	1.0	5x10 ²	Sect 9.4.2
	rm, mech eqpt rm		ATH	86	50	NA	NA 2	Sect 9.4.2
	Reactor aux bd rms	, 1	ATH	104	98	1.0	5x10 ²	Sect 9.4.2
	battery rms	5	ATH	104	90	NA	NA 2	Sect 9.4.2
	Shutdown board	1	ATM	104	98	1.0	5x10 ²	Sect 9.4.2
	transformer room		MTM	104	90	NA	NA	Sect 9.4.2
	Aux fw turb pump r	ms 7	15.2	213	100	NA	NA	Sect 9.4.2
	Pipe chase	7	ATH	140	100 '	NA	NA 2	Sect 9.4.2
Control bldg	Main contr rm,	1	ATM	75	50	0.5	2x 10 ²	Sect. 6.4
	mech eqpt rms	5	ATH	75	50	NA	NA	Sect 15.5.3
	Aux inst & compute	5	ATM	75	50	1.0	5x10 ²	Sect 9.4.1
	rms, comm rm, battery rm	5	ATH.	75	50	NA	NA	Sect 9.4.1
Diesel	Diesel gen rms	1	ATM	120	98	41.6	€5x10 ²	Sect 9.4.5
generator		3	11.4	NA	NA	NA	NA	Sect 3.3

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Table A-1 (Cont.)

building		5	ATH	120	98	NA	NA -	Sect 9.4.5
	Diesel aux board	1	ATH	104	90	4 1.6	4 5x10	Sect 9.4.5
	rms	3	11.4	NA	NA	NA	HA	Sect 3.3
		5	ATH	104	98	NA	NA	Sect 9.4.5
Hain steam	East steam vlv rm	1	MTA	120	100	NA	NA	Sect 9.4.2
valve rooms		7	Note G	Note G	100	NA	NA	Sect 9.4.2
	West steam vlv rm	1	ATH	120	100	NA.	NA	Sept 9.4.2
		7	Note d	Note G	100	NA	NA	Sect 9.4.2

NOTES

- A. Operational condition definations
 - 1. Normal day
 - 2. Hot day, river cooling water at 83 F
 - 3. Tornado (sudden pressure drop of 3.0 psi)
 - 4. Inadvertent containment spray initiation 2200 ppm borated water, ph 7 +
 - 5. Loss-of-coolant accident, hot day, river cooling water at 83 F
 - 6. Hain steam line break (worst case small break for temperature, large break for pressure)
 - 7. High energy line break outside containment (figures 3.11-1 surough 3.11-20)
- B. ATM Atmospheric pressure (14.4 psia at Sequoyah)
 - ATHS Slightly below atmospheric pressure
 - ATH Slightly above atmospheric pressure
- C. Normal humidity range for puxiliary building is 30-80%, except for board rooms, auxiliary control room, mechanical equipment rooms, auxiliary board rooms where a 50% max is maintained.
- D. All radiation dose information can be determined from FSAR Section 3.11.2, figures 12.1-1 through -20 and figures 15.5-% through 15.5-20. Radiation dose information for the integrated accident dose is given in table 3.11-2A.
- E. NA Hot applicable for this operating condition.
- F. No equipment is subject to submergence.
- G. See figures 3.11-1 through 3.11-20.
- H. Sequoyah references the generic Westinghouse LOTIC-3 analysis for MSLB. See FSAB questions Q6.56 and Q6.56A. The containment large break pressure is shown in Watts Ber FSAR figure Q022.15-2.
- I. Values given are peak values. For transient values see figures 6.2-29 and 6.2-30.

Table A-2. Accident Radiation Doses for Plant Areas and Miscellaneous Mechanical Equipment

TABLE 3.11-2A

ACCIDENT RADIATION DOSES FOR PLANT AREAS AND MISCELLANEOUS MECHANICAL EQUIPMENT

Plant Location	Equipment	Integrated Accident Dose (RADS)
Containment	General spaces Ice condenser compartment Airlocks and eqpt hatch seals	1x108 1x107 5x107
Shield building	Annulus	5x10 ⁷
Auxiliary building	General spaces Individually cooled rooms Board rooms ECTS fans, motors, valves, and dampers ECTS filters & elec heaters ABGTS filters & elec heaters	Note ₇ B 1x10 ₃ 1x10 ₇ 3x10 ⁷ 1x10 ₈ 1x10 ⁸
Control building	Main control room, mech eqpt rooms Aux instr room, computer room comm & Cattery rooms	1x10 ²
Diesel generator building	General spaces	1x10 ³

Notes:

- These 1 year integrated doses do not include 40 year normal life integrated dose. Inside containment the 1 year integrated beta dose is 4x10 rads.
 Refer to figures 15.5-16 through -20.
- C All radiation dose values are for operational condition 5 of table 3.11-2. Areas not shown are either not applicable or not significant.

FIGURE SUPPLIED BY THE LICENSEE

point-kernel with-buildup computer code. Doses were integrated to determine equipment exposure for a one year period after the accident. There is no unshielded equipment in the containment, therefore, beta doses were calculated only for surfaces using the semi-infinite cloud equation in Regulatory Guide 1.4.

The calculation of radiation conditions inside containment complies with paragraph 1.4 of NUREG-0588 except as noted below:

- 1. Paragraph 1.4(3) The initial distribution of activity was assumed uniform throughout the containment even though the containment is broken up into upper compartment, lower compartment, and ice condenser. The operation of the air return deck fans will result in sufficient mixing so that this assumption is believed to be valid.
- 2. Paragraph 1.4(5) Natural deposition was not considered. Applicable deposition rates are unknown, and actions of containment spray in the upper compartment, and steam condensation in the lower compartment can be expected to wash the deposited activity into the sump.
- 3.1.4 Submergence N/A (Refer to FSAR Table 3.11-2)

3.2 Outside Containment

3.2.1 High Energy Line Breaks

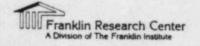
Plant areas outside containment were reviewed to determine areas where high energy piping was located and could potentially produce effects that would impact safety-related equipment. The areas affected by high energy line breaks are the auxiliary building and the main steam valve vaults.

3.2.1.1 Auxiliary Building

The high energy lines located in the auxiliary building are:

- (1) Steam supply to the auxiliary feedwater pump turbine 556°F, 1100 psia, quality 0.9.
- (2) Letdown line 300°F, 2200 psia
- (3) Auxiliary boiler steam supply 309°F, 171 psia, quality - 0.8.

Single-anded circumferential ruptures at the fluid conditions listed above were postulated. Critical cracks in the residual heat removal (RHR) system (350°F, 440



psia) were also postulated. Mass and energy releases for the steam supply lines were generated using the Moody critical flow correlation assuming an f1/D equal to zero. The mass and energy releases for the letdown and RHR lines were generated using the orifice equation. Choking was not assumed to occur and the discharge coefficient was conservatively taken to be unity. Upstream pressure and temperature, and therefore mass flow rates, were assumed to remain constant until the line was isolated. The steam supply lines isolate automatically on high temperature in the auxiliary building. Temperature sensors are located in the vicinity of the line to assure rapid detection and isolation. Isolation times include signal process time, valve stroke time, and break detection time. The sensors used are redundant, class 1E, and electrically trained. Isolation of the letdown and RHR lines requires operator action. Isolation was assumed to occur 10 minutes after the break. Detection of these breaks is based on high space temperature from one of several redundant and electrically trained sensors.

Critical cracks in the residual heat removal (RHR) system (350°F, 440 psia) were also postulated. Mass and energy releases for the steam supply lines were generated using the Moody critical flow correlation assuming an fL/D equal to zero. The mass and energy releases for the letdown and RHR lines were generated using the orifice equation. Choking was not assumed to occur and the discharge coefficient was conservatively taken to be unity. Upstream pressure and temperature, and therefore mass flow rates, were assumed to remain constant until the line was isolated. The steam supply lines isolate automatically on high temperature in the auxiliary building. Temperature sensors are located in the vicinity of the line to assure rapid detection and isolation. Isolation times include signal process time, valve stroke time, and break detection time. The sensors used are redundant, class IE, and electrically trained. Isolation of the letdown and RHR lines requires operator action. Isolation was assumed to occur 10 minutes after the break. Detection of these breaks is based on high space temperature from one of several redundant and electrically trained sensors.

A 21 node model was developed to represent the auxiliary building and used as input to the COMPARE Mod 1 computer code. The homogeneous equilibrium model was chosen and heat sinks were considered. The surface area and volume of the heat sinks were conservatively modeled to under-

predict the total sink present. The Tagami-Uchida condensing heat transfer correlation was employed. Figures 3.2-1 through 3.2-6 show the auxiliary building with the nodes outlined. Figure 3.2-7 is a schematic of the model portraying the various flow paths. Figure 3.2-1, note 1, provides the pipe breaks considered and the nodes where breaks were assumed to occur.

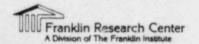
The results provided are a composite profile for each node representing the worst condition in the node at any point in time. Temperature profiles are provided in Figures 3.2-8 through 3.2-19. Notes 3 and 4 of Figure 3.2-1 provide the pressure response versus time for the auxiliary building. The pressure and temperature response of the auxiliary building beyond the analysis time of Figures 3.2-8 through -19 and notes 3 and 4 of Figure 3.2-1 is conservatively assumed to linearly return to ambient in 24 hours. The humidity in all areas of the building as a result of any break is 100 percent during the blowdown phase of the transient and is then conservatively assumed to return to ambient 24 hours after the event.

3.2.1.2 Main Steam Valve Vaults

The high energy lines in the valve vaults are the main steam lines, the steam generator blowdown lines, and the main feedwater lines. Breaks in the main steam line are controlling from an environmental standpoint due to the large line size and the high energy associated with the steam.

A spectrum of steam line breaks were evaluated. The West valve vault evaluations were performed for pipe breaks up to a double-ended rupture. Due to pipe restraints on the main steam lines which limit pipe movement, a single ended steam line rupture was the largest break considered in the East valve vault. A 0.1 square foot slot was the smallest break considered. Mass and energy releases were provided by Westinghouse. Break flows were terminated by isolation of the main steam lines from the unbroken steam generators and main feedwater based on signals from safety-related sensors. Auxiliary feedwater to the faulted steam generator is terminated by operator action 10 minutes after break detection.

For large breaks, the steam valve vaults were modeled using nine nodes in the West vault and ten nodes for the East. These models were input into the SPA Rev 2 computer code. SPA is a subcompartment code using a



homogeneous equilibrium model and models two-component, two-phase flow. Evaluation of superheated steam conditions is also included in the code. No heat sinks were modeled. Small break pressure and temperature transients were analyzed using CONTEMPT LT. Once again, no heat sinks were considered. The valve vaults at Sequoyah were constructed with large vent paths to the outside to provide pressure relief in the event of a pipe break. These paths were included in the models.

The results showed that the large breaks were controlling for both pressure and temperature in the East valve vault and in the West valve vault after the first 15 seconds because of the vents provided. A 0.6-square-foot slot break produces a short temperature spike that exceeds the large break temperatures in the West vault. This spike has been conservatively assumed to last one minute for the purposes of environmental qualification. Figure 3.2-20 provides the pressure and temperature response for the West vault, and Figure 3.2-21 provides the results of the analysis for the West valve vault. These results represent the conditions in the node with the most severe environmental conditions which were applied uniformly to the entire vault.

Figures 3.2-1 through 3.2-21 (except 3.2-7) may be found in the Sequoyah FSAR (section 3.11).

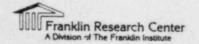
3.2.2 LOCA Impact Outside Containment

Radiation

With the exception of solid state devices, electrical equipment components are constructed of materials having gamma radiation damage thresholds exceeding 10^4 rads. Teflon, which is probably the most sensitive material commonly used in electrical equipment has a threshold for damage of approximately 3.5 x 10^4 rads (for 20 percent decrease in elongation). Electrical properties (e.g., resistivity) of these materials are sufficiently conservative initially, such that substantial changes can be tolerated without causing equipment failures or malfunction.

There is substantial test data available demonstrating that most conventional materials used in electrical equipment can sustain radiation doses much greater than 10⁴ rads without appreciable damage (reference 1 and 2).

On the above basis and the existing test data, it is not considered necessary to perform qualification tests on conventional electrical equipment that will receive radiation doses less than 10^4 rads.



References

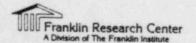
- R. K. Thatcher, et al. REIC Report No. 36, October 1, 1964. "The Effects of Nuclear Radiation on Electronic Components Including Semi- Conductors." Radiation Effects Information Center, Battelle Memorial Institute, Columbus, Ohio.
- W. W. Parkinson and L. Sisman, Oak Ridge National Laboratory, Oak Ridge, Tennessee. <u>Nuclear Engineering and Design</u> 17 (1971) 247-280, "The Use of Plastics and Elastomers for Nuclear Radiation."

Environmental Control

Cubicles in areas containing emergency operated safety feature equipment are ventilated by the building ventilation exhaust duct system during normal plant operation or when equipment is not required to operate. Air cooling units, located in each cubicle or area, will automatically start to provide necessary cooling whenever the safety feature equipment is operated. Each of these coolers is designed to limit the maximum ambient to 110°F, and is interlocked to operate with the equipment it serves. A thermostat, located near the return airflow to each cooler, allows the cooler to remain in operation until the low limit temperature set point is reached. The cooling water control valve and fan are interlocated to operated together.

Air cooling units are provided for the following equipment and areas:

- 1. RHR pumps
- 2. Safety injection pumps
- 3. Containment spray pumps
- 4. Centrifugal charging pumps
- 5. Reciprocating charging pumps
- 6. Unit 1 auxiliary feedwater and component cooling water pumps
- 7. Unit 2 auxiliary feedwater and boric acid transfer pumps
- 8. Component cooling water booster and spent fuel pit pumps
- 9. Pipe chases
- 10. El 669 penetration rooms
- 11. El 690 penetration rooms



- 12. El 714 penetration rooms
- 13. Emergency gas treatment assemblies

The above pumps 1 through 5 are each located in a separate room with cooler, and each room (containing pump and cooler) is provided with 100 percent redundancy. Pumps and equipment 6 through 13 are each provided with two 100 percent coolers with one on standby.

The safety feature equipment coolers are designed to limit the maximum ambient temperature to 110°F when supplied with water at 83°F.

3.2.2.1 Annulus

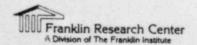
The radiation environment inside the annulus after a LOCA is based on an estimate of the dose due to shine through the primary containment steel shell from airborne activity in the primary containment. The dose due to airborne activity within the annulus was assumed to be small compared to the shine from containment.

The method used to determine annulus peak temperature employed standard heat transfer relations expressed in finite-difference form and is considered to be conservative. Heat transfer across the primary containment shell was modeled dividing the shell into three regions. The upper region corresponded to that portion of the unit above a horizontal plane passing through the top of the crane wall. The lower region corresponded to that position of the unit below a horizontal plane passing through the bottom deck of the ice-condenser section. The middle region corresponded to the ice-condenser portion of the unit. Natural convective heat transfer was assumed to occur between the primary containment shell and the annulus air. In addition, radiative heat transfer was modeled between the containment shell and the shield building walls.

Annulus peak humidity was defined to be 100 percent, although no source of humidification was identified in the annulus for the post-LOCA case.

NUREG-0588 does not provide specific guidance for calculation of environmental parameters in the annulus.

3.2.2.2 The normal operating radiation environment in the auxiliary building is shown in FSAR figures 12.1-1 through 12.1-7 (amendment 18, figures 12.1-1 through -3; amendment 56, figure 12.1-5; and amendment 59, figures 12.1-4). The radiation exposure in the general spaces of the auxiliary building after a design basis LOCA is due to (1) containment sump fluid being



circulated in the RHR, CS, and SI systems, (2) airborne activity in the auxiliary building, and (3) shine from activity in the containment. The source terms used for this accident are those suggested by the NRC for use in response to NUREG-0578 and correspond to TID-14844 releases. Flow diagrams and equipment layouts were reviewed to determine the flow paths which would be used after an accident and to determine the volume and physical locations of contaminated fluids in the auxiliary building. The layout of the shield walls and equipment within the rooms were conservatively modeled. Source terms were calculated at various times after an accident. Dose rates were then calculated at several positions in the auxiliary building with respect to the contained sources and at various times after an accident. locations where dose rates were calculated were chosen to conservatively calculate the dose rates in corridors, outside equipment cubicles, in adjacent rooms, and within the equipment cubicles. These dose rates were then integrated to determine equipment exposure for a one-year period after the accident. Airborne activity in the auxiliary building is due to gaseous leakage from the containment which is processed and exhausted through HEPA and charcoal filters in the auxiliary building gas treatment system. The dose rates through the shield building from activity released into the containment atmosphere were also calculated (reference TVA's response to NUREG-0578).

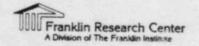
The calculation of radiation conditions outside containment in auxiliary building general spaces complies with paragraph 1.4 of NUREG-0588.

3.2.2.3 The basis for the radiation exposure in individually cooled rooms in the auxiliary building is the same as described above for general spaces at the auxiliary building. The dose rate in a room is due almost entirely to the activity being circulated through equipment in that room.

The calculation of radiation conditions outside containment in auxiliary building individually cooled rooms compiles with paragraph 1.4 of NUREG-0588."

Accident Conditions Inside Primary Containment

For PWR plants, the DOR Guidelines state that the environmental service conditions inside containment for the loss-of-coolant accident (LOCA) should be established by the Licensee based on the FSAR analysis. In addition, for plants equipped with automatic containment spray systems not subject to single



component failure or delayed initiation, the Guidelines state that equipment qualified for the LOCA environment is also considered qualified for the postulated main-steam-line break accident (MSLB). The design of this plant satisfies these criteria. The Licensee has stated that equipment qualified for a LOCA environment can be considered qualified for a MSLB accident environment.

With respect to primary containment service conditions, the Licensee stated [12]:

"A discussion of the effect(s) of a single failure of a component on the containment spray system operability is given in the revised Section 3.1.2 of the EEEQR contained in attachment 3."

The Licensee also provided the following response with respect to temperature margins applied to the primary containment accident profile [12]:

"A revised Section 3.0 and/or Table 3.11-2 of the EEEQR extending the MSLB temperature/pressure profiles for the lower compartment to at least 10^5 seconds will be submitted with the next revision of the EEEQR."

With regard to submergence inside containment, the Licensee stated [12]:

"A new level of submergence has been calculated and is discussed in the revised Section 3.1.4 and Table 3.11-2 notes of the EEEQR contained in attachment 3. TVA is presently investigating those components that may be subjected to submergence and will report on the results of this investigation at a later date."

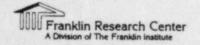
With regard to chemical spray, the Licensee stated [12]:

"The effects of 2000 ppm boric acid (chemical spray) upon equipment qualification for that equipment located inside primary containment is addressed on the attachments to the EQS and/or in the column titled 'Environment to which qualified' on Table 3.11-4 in the EEEQR. For that equipment to be tested or replaced, this will be addressed in the same manner after testing or replacement."

3.3 <u>Definition of Service Conditions for Normal and Abnormal</u> Environments

The attached table identifies environmental conditions for the various plant compartments, spaces, and general areas which are expected to occur during normal plant operation and the specified meteorlogical and design basis events. The information in this table has been extracted from section 3.11 of the Sequoyah FSAR. Note that most of the environmental conditions lasted for "normal" days are, in essence, maximum design values used to define equipment procurement requirements. These values were established during the initial design ph se of Sequoyah and are, in general, reflected in the FSAR and TVA design documents. Inconsistencies between this table and the original environmental design bases reflect changes (via amendments to the FSAR tables) to identify actual plant conditions measured during preoperational and startup tests and/or parameter revisions resulting from upgraded design and system reviews.

Figure A-1. Definition of Service Conditions for Normal and Absormal Environments



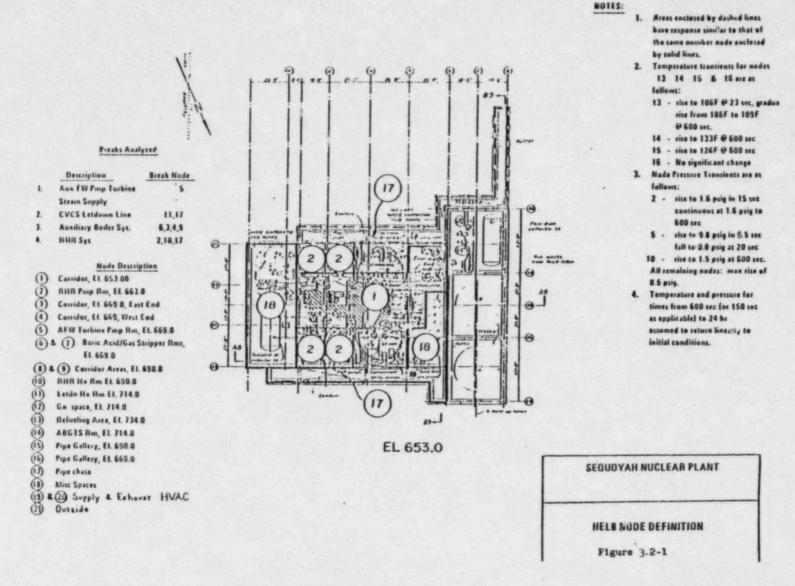


Figure A-2. HELB Node Definition, Elev. 653.0

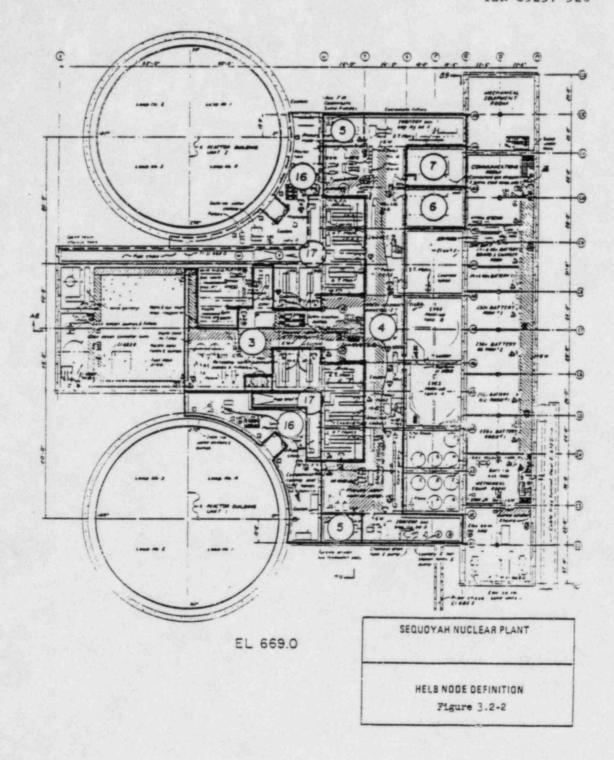
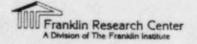


Figure A-3. HELB Node Definition, Elev. 669.0



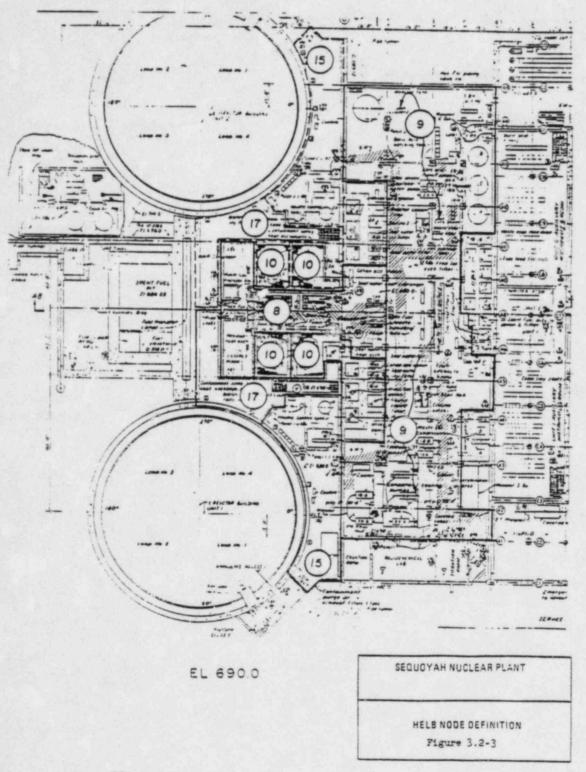
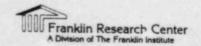


Figure A-4. HELB Node Definition, Elev. 690.0



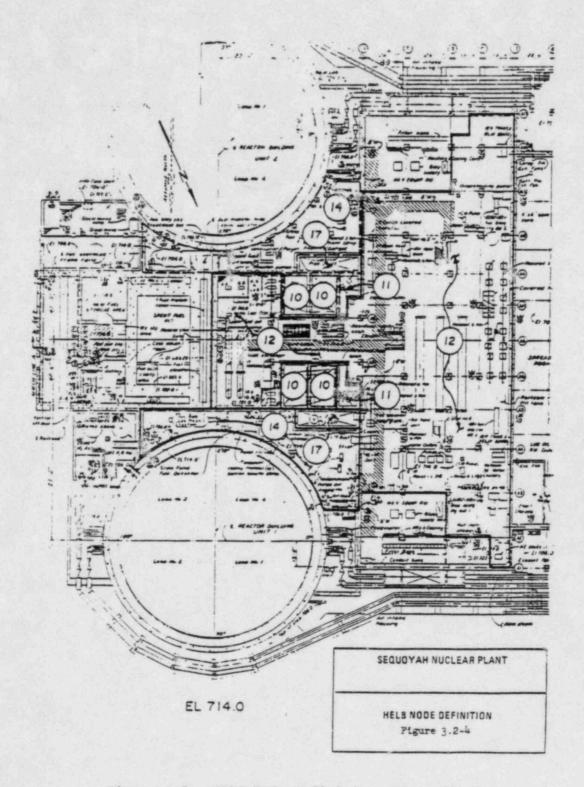
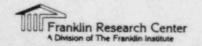


Figure A-5. HELB Node Definition, Elev. 714.0



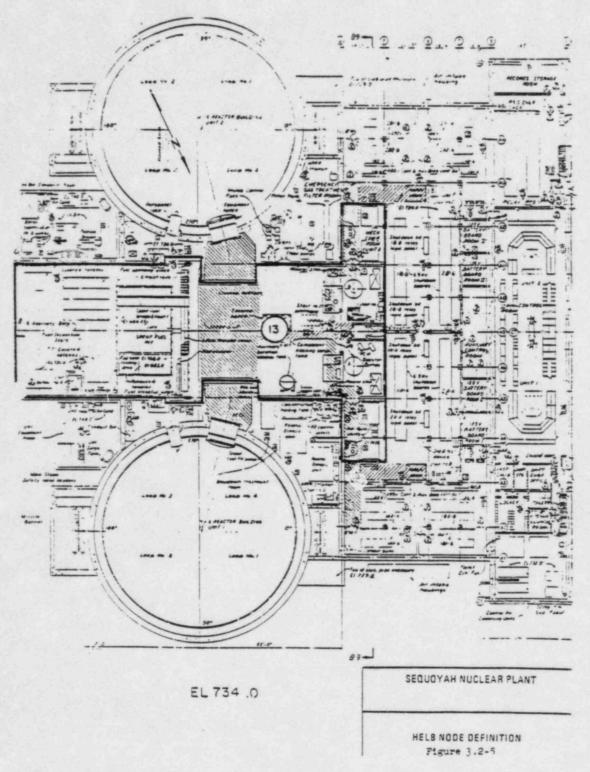
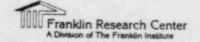


Figure A-6. HELB Node Definition, Elev. 734.0



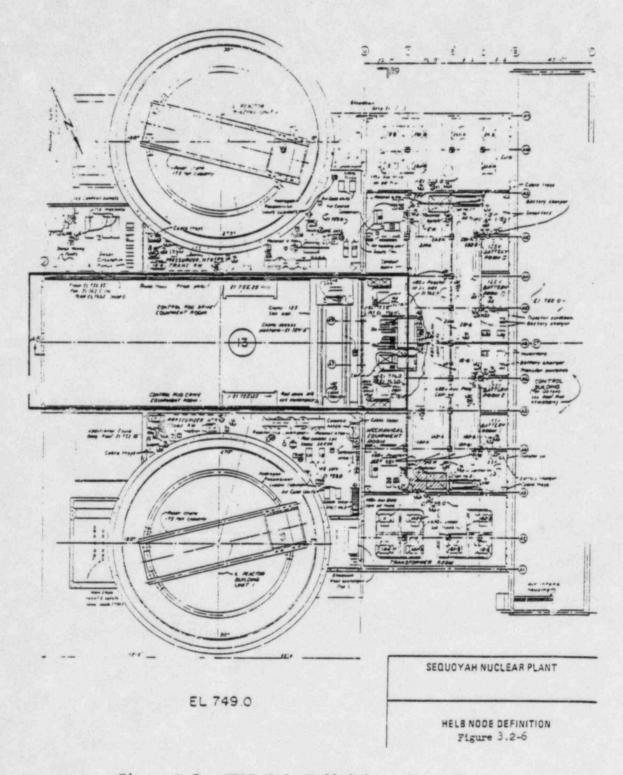


Figure A-7. HELB Node Definition, Elev. 749.0

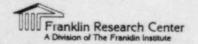


Figure 3.2-7 DAN Aux Bldg Note: Discrum (Flow Arens in Ft²)

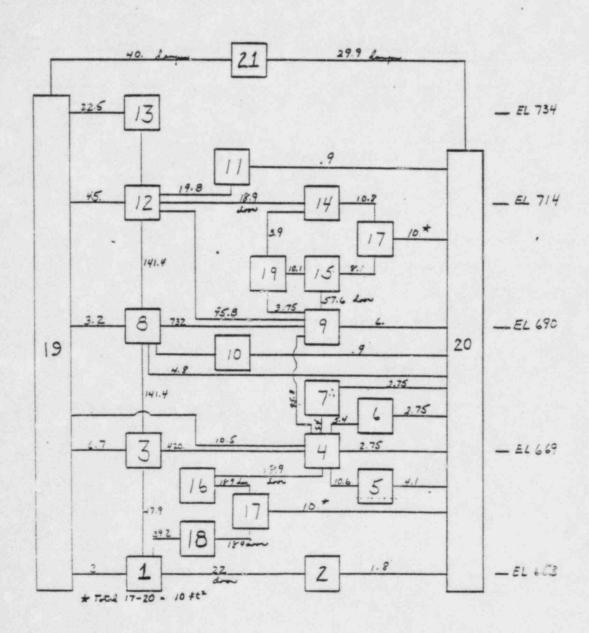
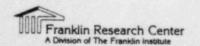


Figure A-8. SQN Auxiliary Building, Nodal Diagram (Flow Areas in Ft2)



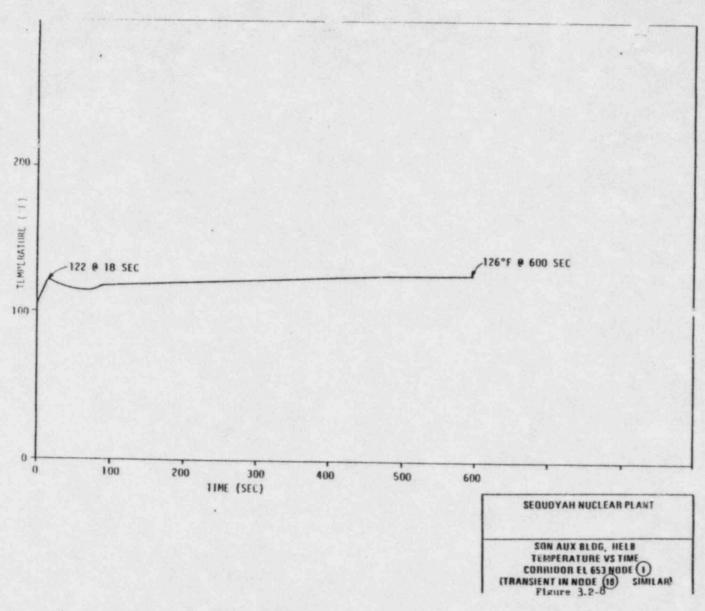


Figure A-9. SQN Auxiliary Building, HELB Temperature vs. Time, Corridor Elev. 653, Node 1 (Transient in Node 18 Similar)

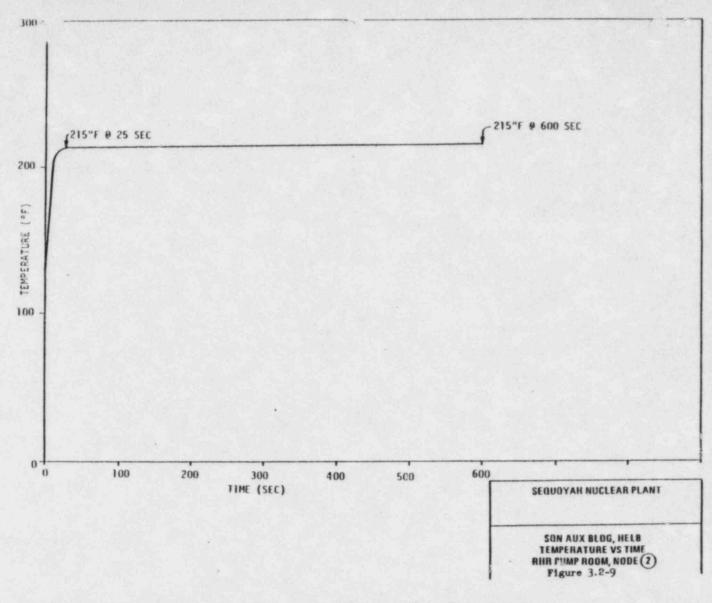


Figure A-10. SQN Auxiliary Building, HELB Temperature vs. Time, RHR Pump Room, Node 2

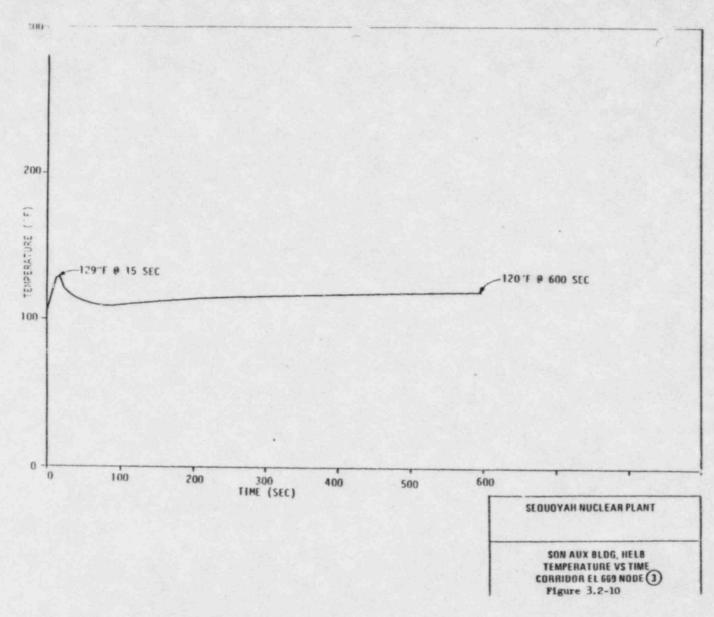
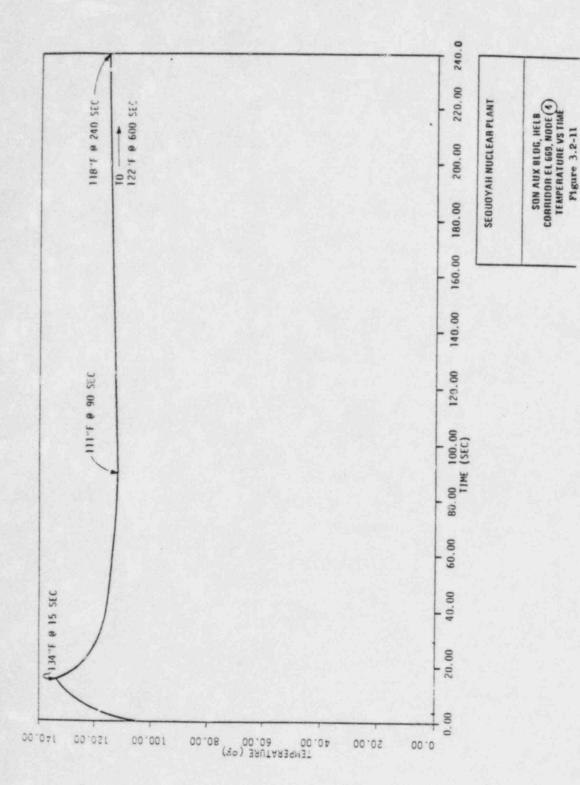
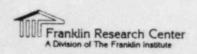


Figure A-11. SQN Auxiliary Building, HELB Temperature vs. Time, Corridor Elev. 669, Node 3



SQN Auxiliary Building, HELB, Corridor Elev. 669, Node 4, Temperature vs. Time Figure A-12.



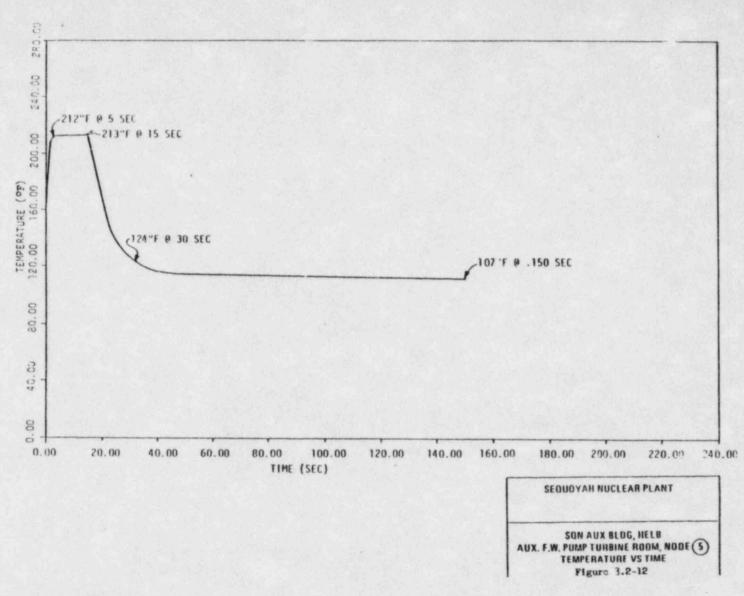
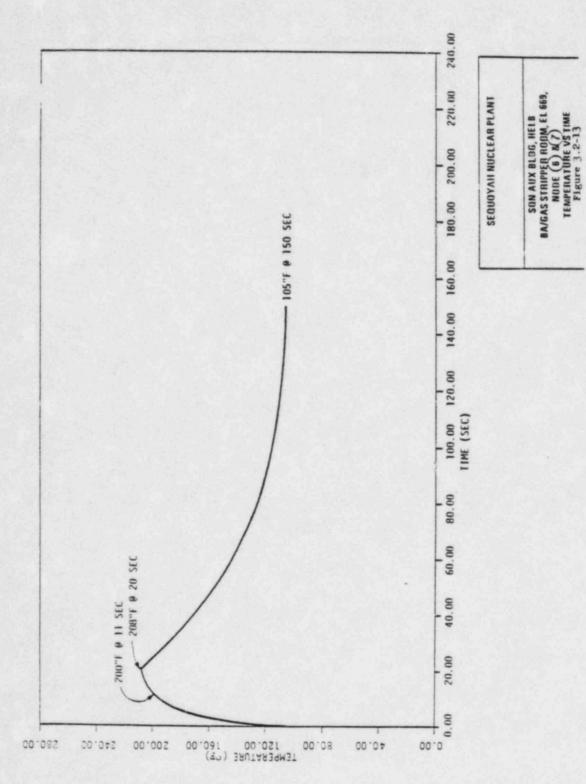
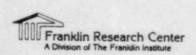


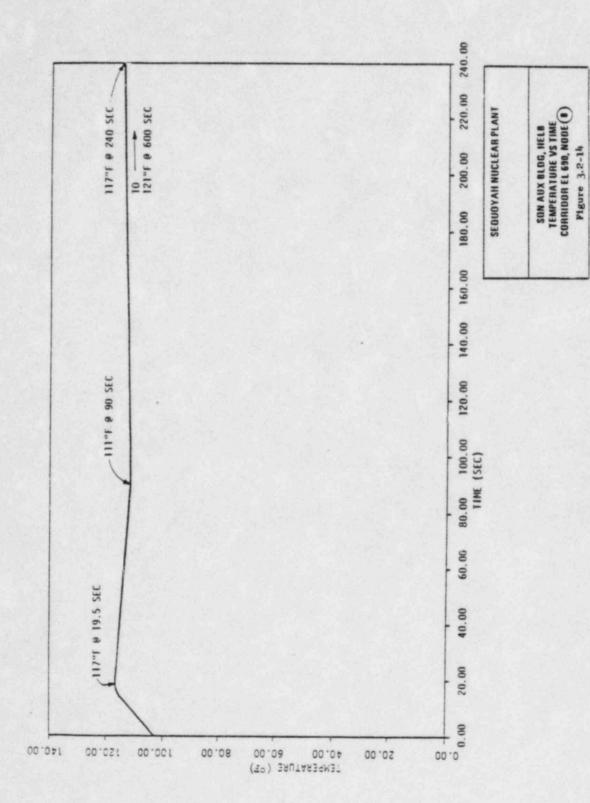
Figure A-13. SQN Auxiliary Building, HELB, Auxiliary Feedwater Pump Turbine Room, Node 5, Temperature vs. Time

BY THE LICENSEE

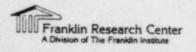


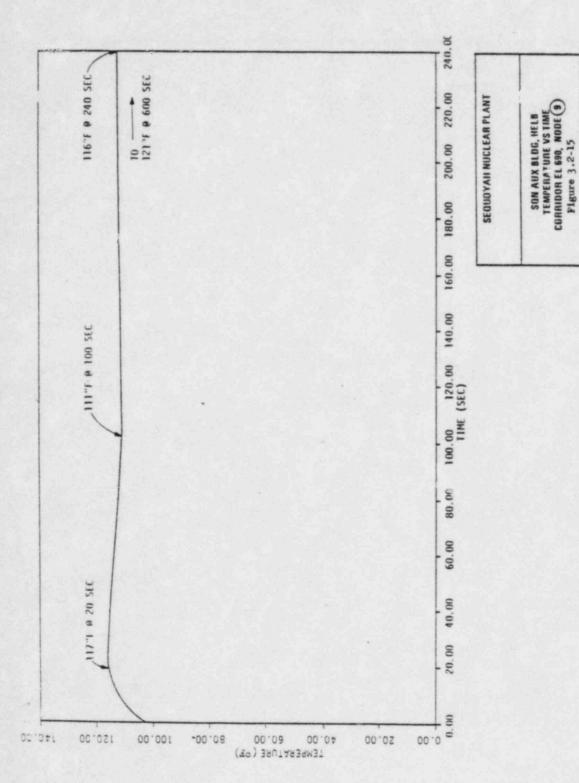
SQN Auxiliary Building, HELB, BA/Gas Stripper Room, Elev. 669, Nodes 6 and 7, Temperature vs. Time Figure A-14.





SQN Auxiliary Building, HELB, Temperature vs. Time, Corridor Elev. 690, Node 8 Figure A-15.





SQN Auxiliary Building, HELB, Temperature vs. Time, Corridor Elev. 690, Node 9 Figure A-16.

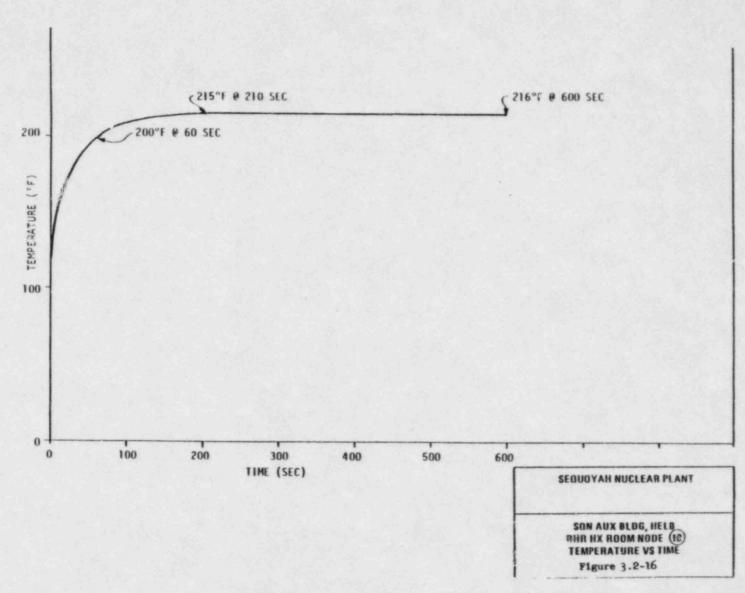
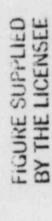
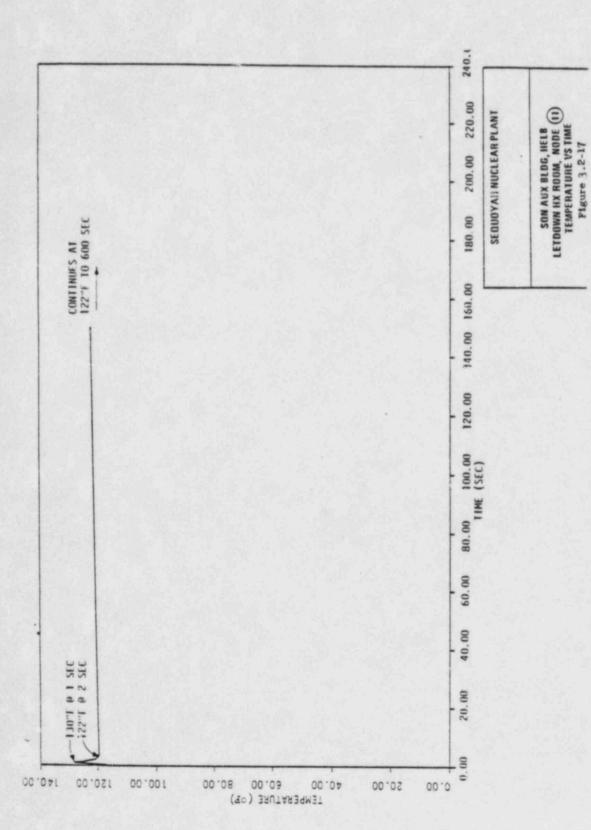
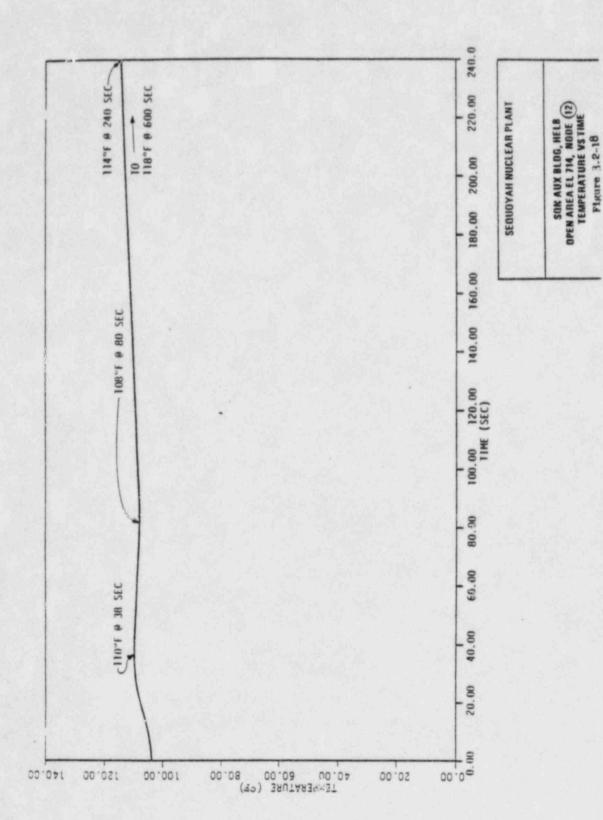


Figure A-17. SQN Auxiliary Building, HELB, RHR Hx Room, Node 10, Temperature vs. Time

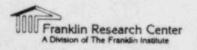




SQN Auxiliary Building, HELB, Letdown Hx Room, Node 11, Temperature vs. Time Figure A-18.



SQN Auxiliary Building, HELB, Open Area Elev. 714, Node 12, Temperature vs. Time Figure A-19.



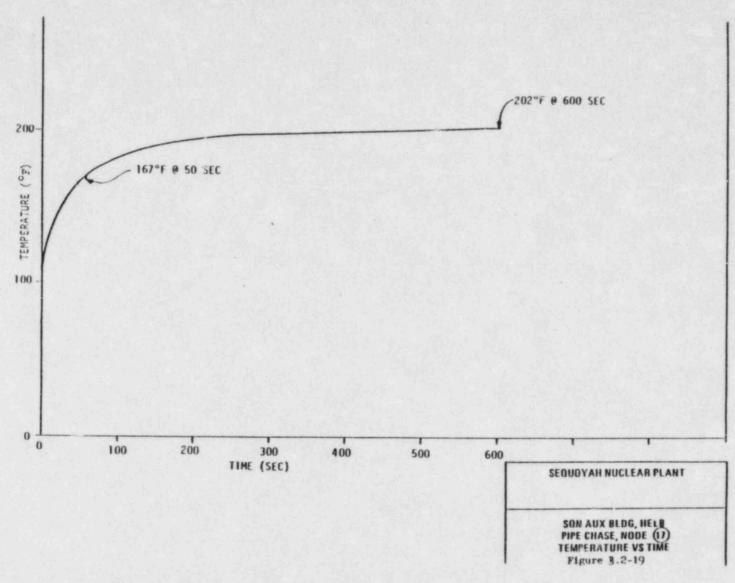
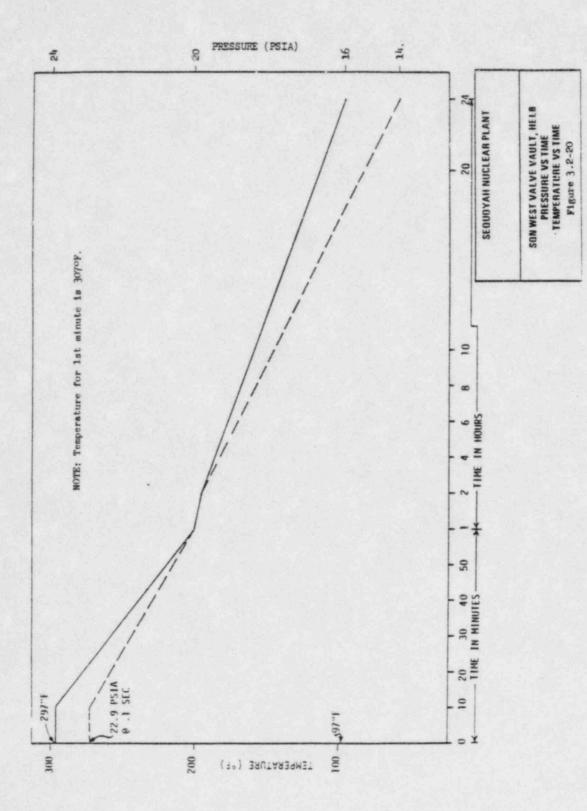


Figure A-20. SQN Auxiliary Building, HELB, Pipe Chase. Node 17, Temperature vs. Time



SQN West Valve Vault, HELB, Pressure vs. Time, Temperature Figure A-21.

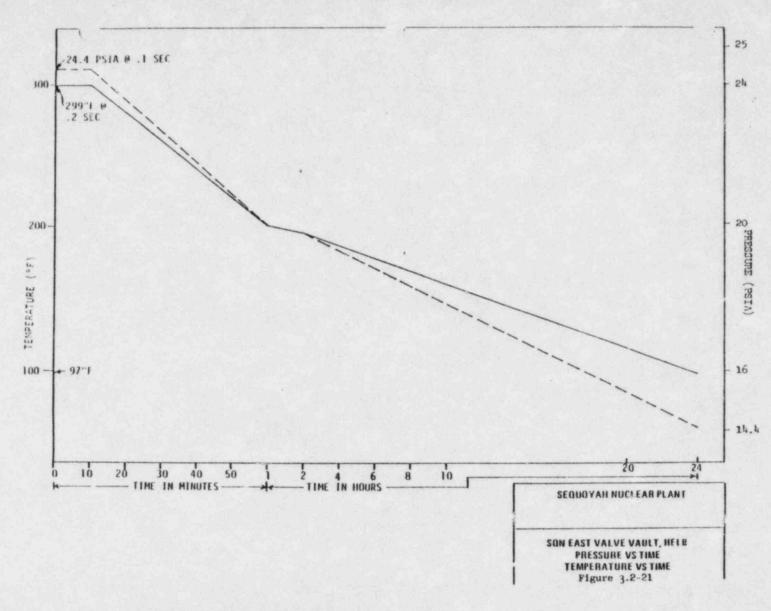


Figure A-22. SQN East Valve Vault, HELB, Pressure vs. Time, Temperature vs. Time.

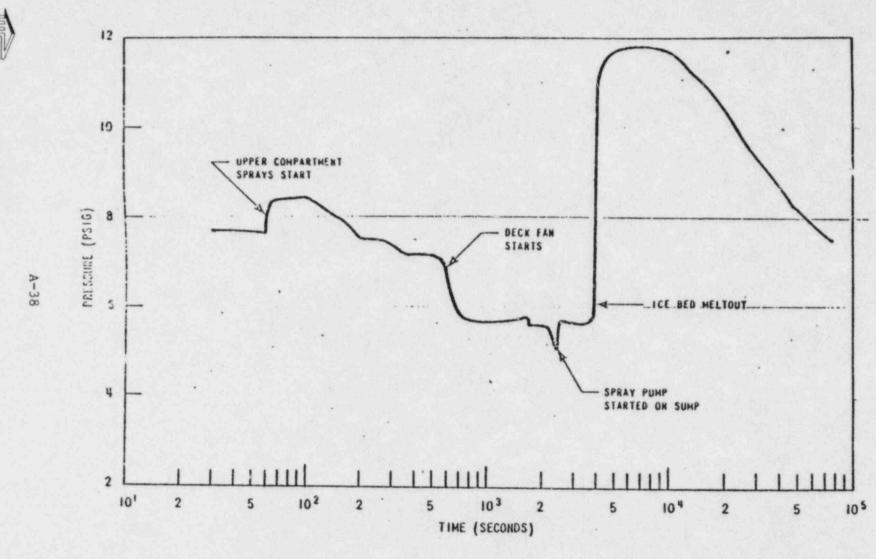


Figure B.1-1. Containment Pressure - Double Ended Pump Swction Break

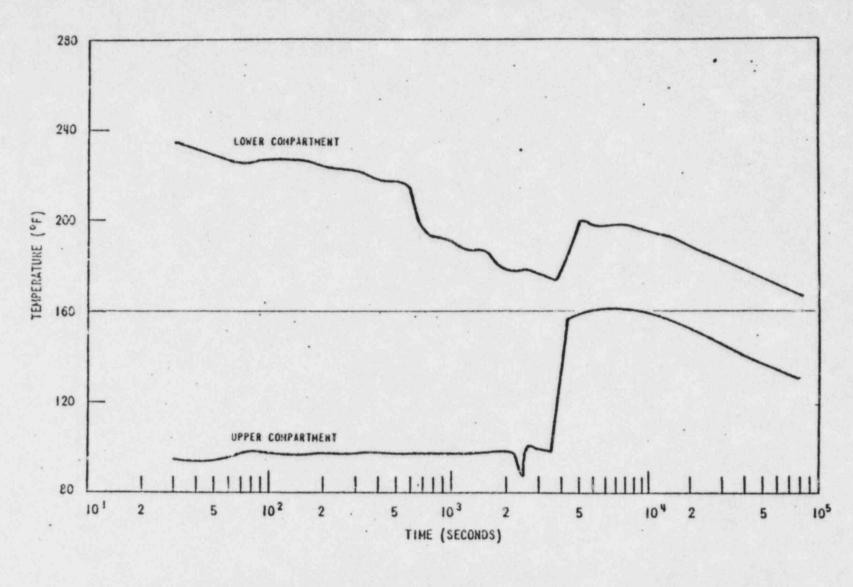


Figure B.1-2. Containment Temperature Double Ended Pump Suction Break

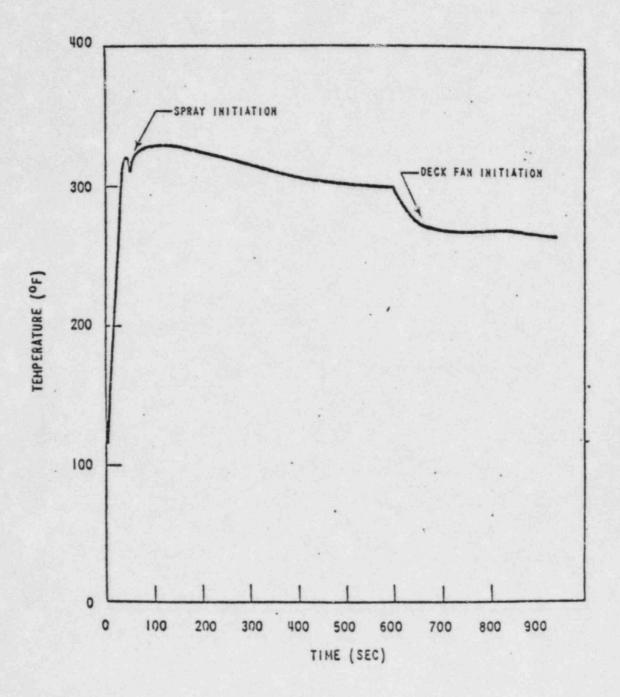
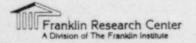


Figure B.1-3. Containment Temperature Versus Time for the Most Severe Steam Line Break



APPENDIX B - LISTING OF SAFETY-RELATED ELECTRICAL EQUIPMENT

The following table lists the groupings of safety-related electrical equipment items for the Sequoyah Nuclear Plant Unit 2. Equipment items provided in the table are used in the detailed equipment environmental qualification evaluation presented in Section 4.4 and summarized in Section 4.2. This table was generated from the lists of equipment provided by the Licensee [11].

The Licensee identified an extensive list of safety-related electrical equipment in various locations of the plant. The equipment listed by the Licensee was analyzed, and all identical equipment located within plant areas that are exposed to the same environmental service conditions was grouped together and designated an equipment item." In this report, the term "equipment item" refers 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 AUXILIARY BUILDING AND ANNULUS

LINK-BELT MODELS TN200/TN2000

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 1

LICENSEE REFERENCE(S): 3008

FUNCTION (PLANT ID): CONTROL AND ISOLATION VALVE (FCV 67-123, -125, -127,

-128, -146, -147, -151, -152, -233)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-005 (TABLE 3.11-6/6; TABLE 3.11-8/22)

FUNCTION (PLANT ID): CONTROL AND ISOLATION VALVE (FCV 67-205, -208)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-005 (TABLE 3.11-6/6; TABLE 3.11-8/17)
FUNCTION (PLANT ID): AUXILIARY BUILDING ERCW HEADER A & B ISOLATION VALVE
(FCV 67-81, -82)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-005 (TABLE 3.11-7/3; TABLE 3.11-8/31)
FUNCTION (PLANT ID): CONTAINMENT SPRAY HEAT EXCHANGER A AND B DISCHARGE VALVE

(FCV 67-126, -124)

LICENSEE SUBMITTAL: MEB 67-005 (TABLE 3.11-7/3; TABLE 3.11-8/29)

FUNCTION (PLANT ID): UPPER AND LOWER CONTAINMENT COOLERS SUPPLY AND DISCHARGE

ISOLATION VALVES (FCV 67-83, -88, -91, -96, -99, -104,

-107, -112)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-005 (TABLE 3.11-5/3)

EQUIPMENT ITEM NO. 2

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (GENERAL SPACES AND INDIVIDUALLY COOLED ROOMS)

LINK-BELT MODELS TN200/TN2000

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 2

LICENSEE REFERENCE(S): 3008

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVES (FCV70-2, -3, -4, -8, -9, -10, -11, -12, -15, -40, -41, -193, -194, -195, -196,

-197, -198)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/22)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVES (FCV70-13, -22, -23, -25,

-26, -27, -34, -39, -64, -74)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-004 (TABLE 3.11-7/20; TABLE 3.11-8/5)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVES (FCV70-14, -16, -18, -28, -29)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/19)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV70-75, -168)

LICENSEE SUBMITTAL: MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/12)

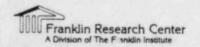
FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV70-76, -78) LICENSEE SUBMITTAL: MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/15)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALUE (FCV 70-111)

LICENSEE SUBMITTAL: MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/11)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV 70-153, -156)

LICENSEE SUBMITTAL: MEB 70-004 (TABLE 3.11-6/6; TABLE 3.11-8/5)



EQUIPMENT ITEM NO. 2 (CONTINUED)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV 70-92, -139, -140,

-143)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-004 (TABLE 3.11-7/3; TABLE 3.11-8/35)

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV 70-1) LICENSEE SUBMITTAL: SCEW(S): MEB 70-004 (TABLE 3.11-7/16)

EQUIPMENT ITEM NO. 3

MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST VALVE ROOMS

CHICAGO FLUID POWER MODEL TVA-01-0577

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 3

LICENSEE REFERENCE(S): 4277, 4278

FUNCTION (PLANT ID): ISOLATION VALVE (FSV1-4A, B, D, E, F, G, H, J; FSV1-29A,

B, D, E, F, G, H, J)

LICENSEE SUBMITTAL: SCEW(S): MEB 1-003 (TABLE 3.11-8/3)

EQUIPMENT ITEM NO. 4

MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST VALVE ROOM

CHICAGO FLUID POWER MODEL TVA-01-0577

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 4

LICENSEE REFERENCE(S): 4277, 4278

FUNCTION (PLANT ID): ISOLATION VALUE (FSV1-11A, B, D, E, F, G, H, J;

FSV1-22A, B, D, E, F, G, H, J)

LICENSEE SUBMITTAL: SCEW(S): MEB 1-003 (TABLE 3.11-8/4)

EQUIPMENT ITEM NO. 5

ELECTROHYDRAULIC VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (CORRIDOR, ELEV. 690')

MEA MODEL MEA119K2

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 5

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MODIFIER-AFW PUMP VALUE ACTUATORS (FM-3-122, -132)

LICENSEE SUBMITTAL: SCEW(S): EEB-1023 (TABLE 3.11-6/1; TABLE 3.11-8/16)

EQUIPMENT ITEM NO. 6

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING

LIMITORQUE MODEL SMB; SIZES 00, 000

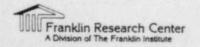
REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 6

LICENSEE REFERENCE(S): 662, 2876

FUNCTION (PLANT ID): REMOTE MANUAL ISOLATION VALVE (FCV70-183)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-012 (TABLE 3.11-6/6)



EQUIPMENT ITEM NO. 6 (CONTINUED)

FUNCTION (PLANT ID): RCP THERMAL BARRIER CONTAINMENT ISOLATION VALVE

(FCV 70-90)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-012 (TABLE 3.11-7/3; TABLE 3.11-8/35)

FUNCTION (PLANT ID): CONDENSATE DEMINERALIZER WASTE EVAPORATOR CONTROL VALVE

(FCV 70-206)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-012 (TABLE 3.11-6/7; TABLE 3.11-8/11)

FUNCTION (PLANT ID): CONDENSATE DEMINERALIZER WASTE EVAPORATOR CONTROL VALVE

(FCV 70-207, -208)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-012 (TABLE 3.11-6/7; TABLE 3.11-8/24)

FUNCTION (PLANT ID): RCP THERMAL BARRIER CONTAINMENT ISOLATION VALVE (FCV

70-133, -134)

LICENSEE SUBMITTAL: SCEW(S): MEB 70-012 (TABLE 3.11-7/3; TABLE 3.11-8/6)

EQUIPMENT ITEM NO. 7

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, PIPE CHASE

LIMITORQUE MODEL SMB; SIZE 000

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 7

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): CONTAINMENT SPRAY RECIRCULATION FLOW ISOLATION VALVE

(FCV 72-13, -34)

LICENSEE SUBMITTAL: SCEW(S): MEB 72-013 (TABLE 3.11-7/2; TABLE 3.11-8/34)

EQUIPMENT ITEM NO. 8

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (INDIVIDUALLY COOLED ROOMS)

LIMITORQUE MODEL SMB; SIZES 1, 2

REQUIRED OPERATING TIME: 1 DAY TO 1 YEAR

TER CHECKSHEET NO. 8

LICENSEE REFERENCE(S): 662, 663

FUNCTION (PLANT ID): CONTAINMENT SPRAY HEADER A AND B ISOLATION VALVES

(FCV 72-2, -39)

LICENSEE SUBMITTAL: SCEW(S): MEB 72-010 (TABLE 3.11-7/3; TABLE 3.11-8/27)

FUNCTION (PLANT ID): CONTAINMENT SPRAY HEADER A AND B ISOLATION VALVES

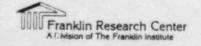
(FCV 72-20, -23, -21, -22)

LICENSEE SUBMITTAL: SCEW(S): MEB 72-010 (TABLE 3.11-7/3; TABLE 3.11-8/35)

FUNCTION (PLANT ID): CONTAINMENT SPRAY RECIRCULATION FLOW ISOLATION VALVES

(FCV 72-40, -41)

LICENSEE SUBMITTAL: SCEW(S): MEB 72-010 (TABLE 3.11-7/2; TABLE 3.11-8/34)



EQUIPMENT ITEM NO. 9

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (CORRIDOR 690, AFWP TURBINE ROOM)

LIMITORQUE MODEL SMB; SIZES 00, 000

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 9

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): ERCW HEADER ISOLATION VALVE (FCV 116A, B; -126A, B)
LICENSEE SUBMITTAL: SCEW(S): MEB 3-007 (TABLE 3.11-7/20; TABLE 3.11-8/16)
FUNCTION (PLANT ID): FRCW TO AFWP TURBINE ISOLATION VALVE (FCV 3-136A, B;

-179A, B)

LICENSEE SUBMITTAL: SCEW(S): MEB 3-007 (TABLE 3.11-6/7; TABLE 3.11-8/1)

EQUIPMENT ITEM NO. 10

MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST VALVE ROOM

LIMITORQUE MODEL SMB; SIZES 00

REQUIFED OPERATING TIME: 15 MINUTES

TER CHECKSHEET NO. 10

LICENSEE REFERENCE(S): 662, 2876

FUNCTION (PLANT ID): ARW PUMP TURBINE SUPPLY FROM STEAM GENERATOR (FCV-1-15,

-16)

LICENSEE SUBMITTAL: SCEW(S): MEB 1-006 (TABLE 3.11-8/3) FUNCTION (PLANT ID): ISOLATION VALVE (FCV-1-17, -18) LICENSEE SUBMITTAL: SCEW(S): MEB 1-006 (TABLE 3.11-8/3)

EQUIPMENT ITEM NO. 11

MOTORIZED VALVE ACTUATOR LOCATED IN THE EAST VALVE ROOM

LIMITORQUE MODEL SMB; SIZE 4

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 11

LICENSEE REFERENCE(S): 663, 2876

FUNCTION (PLANT ID): ISOLATION VALVE (FCV 3-47, -87) LICENSEE SUBMITTAL: SCEW(S): MEB 3-011 (TABLE 3.11-8/4)

EQUIPMENT ITEM NO. 12

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, INDIVIDUALLY

COOLED ROOMS

LIMITORQUE MODEL SMB; SIZE 00

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 12

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): MOB-RCP SPRAY ANNULUS STANDPIPE AND SPRINKLER SYSTEM

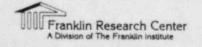
ISOLATION VALVE (FCV 26-240, -241, -242)

LICENSEE SUBMITTAL: SCEW(S): MEB 26-008 (TABLE 3.11-7/3; TABLE 3.11-8/31)

FUNCTION (PLANT ID): MOB-RCP SPRAY ANNULUS STANDPIPE AND SPRINKLER SYSTEM

ISOLATION VALVE (FCV 26-244, 245)

LICENSEE SUBMITTAL: SCEW(S): MEB 26-008 (TABLE 3.11-7/3)



EQUIPMENT ITEM NO. 12 (CONTINUED)

FUNCTION (PLANT ID): MOB-RCP SPRAY ANNULUS STANDPIPE AND SPRINKLER SYSTEM

ISOLATION VALVE (FCV 26-243)

LICENSEE SUBMITTAL: SCEW(S): MEB 26-008 (TABLE 3.11-7/3; TABLE 3.11-8/29)

EQUIPMENT ITEM NO. 13

MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT

LIMITORQUE MODEL SMB; SIZE 000

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 13

LICENSEE REFERENCE(S): 706, 2876

FUNCTION (PLANT ID): LOWER CONTAINMENT COOLER DISCHARGE VALVE (FCV 67-87,

-95, -103, -111)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-014 (TABLE 3.11-4/5)

FUNCTION (PLANT ID): UPPER CONTAINMENT VENT COOLER (FCV 67-295, -296, -297,

-298)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-014 (TABLE 3.11-4/5)

EQUIPMENT ITEM NO. 14

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (OPEN AREA, ELEV. 714')

LIMITORQUE MODEL SMB; SIZE 000

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 14

LICENSEE REFERENCE(S): 663

FUNCTION (PLANT ID): CONTROL VALVE (FCV 67-424)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-016 (TABLE 3.11-6/6; TABLE 3.11-8/21)

EQUIPMENT ITEM NO. 15

MOTORIZED VALVE ACTUATOR LOCATED IN THE ANNULUS

LIMITORQUE MODEL SMB; SIZE 000

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 15

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): UPPER AND LOWER CONTAINMENT COOLERS SUPPLY AND DISCHARGE

ISOLATION VALVES (FCV-67-130, -131, -133, -134, -138,

-139, -141, -142)

LICENSEE SUBMITTAL: SCEW(S): MEB 67-026 (TABLE 3.11-5/3)

EQUIPMENT ITEM NO. 16

MOTORIZED VALVE ACTUATOR LOCATED IN THE WEST VALVE ROOM

LIMITORQUE MODEL SMB; SIZE 4

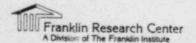
REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 16

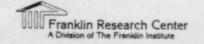
LICENSEE REFERENCE(S): 663, 2876

FUNCTION (PLANT ID): ISOLATION VALVE (FCV 3-33, -100)

LICENSEE SUBMITTAL: SCEW(S): MEB 3-009 (TABLE 3.11-8/3)



LIMITORQUE MODEL SMB: SIZE 000 REQUIRED OPERATING TIME: 5 DAYS TER CHECKSHEET NO. 17 LICENSEE REFERENCE(S): 706, 2876 FUNCTION (PLANT ID): RCP THERMAL BARRIER (FCV 70-87) LICENSEE SUBMITTAL: SCEW(S): MEB 70-015 (TABLE 3.11-4/6) FUNCTION (PLANT ID): RCP ALL COOLER (FCV 70-89) LICENSEE SUBMITTAL: SCEW(S): MEB 70-015 (TABLE 3.11-4/6) EQUIPMENT ITEM NO. 18 MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, INDIVIDUALLY COOLED LIMITORQUE MODEL SMB; SIZES 00, 0, 1, 2, 3 REQUIRED OPERATING TIME: 1 YEAR TER CHECKSHEET NO. 18 LICENSEE REFERENCE(S): 662 FUNCTION (PLANT ID): CHARGING PUMP FLOW TO RWST (LCV 62-135, -136) LICENSEE SUBMITTAL: SCEW(S): (TABLE 3.11-7/11) FUNCTION (PLANT ID): RHR PUMP (A-A, B-B) INLET FLOW CONTROL VALVE (FCV 74-3, -21)LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/11; TABLE 3.11-8/10; TABLE 3.11-7-2/3; TABLE 3.11-8-2/2 FUNCTION (PLANT ID): SIS PUMP (A-A, B-B TO RWST ISOLATION VALVE (FCV 63-4. -175)LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/11; TABLE 3.11-7-2/3; TABLE 3.11-8-2/2 FUNCTION (PLANT ID): SIS PUMP (A-A, B-B) INLET VALVE (FCV 63-47, -48) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/11 FUNCTION (PLANT ID): CONTAINMENT SUMP FLOW ISOLATION VALVE (FCV 63-72, -73) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/11 FUNCTION (PLANT ID): SEAL FLOW ISOLATION VALVE (FCV 62-63) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/6; TABLE 3.11-8/32 FUNCTION (PLANT ID): SIS PUMP (A-A, B-B) FLOW MOV (FCV 63-152) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/8; TABLE 3.11-8/32 FUNCTION (PLANT ID): TO RCS COLD LEGS MOV (FCV 63-153) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/8; TABLE 3.11-8/32 FUNCTION (PLANT ID): SIS PUMP (A-A, B-B) FLOW MOV (FCV 63-156) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/8; TABLE 3.11-8/35 FUNCTION (PLANT ID): TO RCS HOT LEGS MOV (FCV 63-157) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/8; TABLE 3.11-8/35; TABLE 3.11-7-2/3; TABLE 3.11-8-2/2 FUNCTION (PLANT ID): CHARGING PUMP MINI-FLOW (FCV 62-98, -99) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/8; TABLE 3.11-8/8 FUNCTION (PLANT ID): CHARGING FLOW ISOLATION VALVES (FCV 62-90, -91) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/9; TABLE 3.11-8/23 FUNCTION (PLANT ID): RHR PUMP (A-A, B-B) DISCHARGE TO COLD LEGS 1, 2, 3, 4 MOV (FCV 63-93, -94)



EQUIPMENT ITEM NO. 17

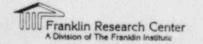
MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/9; TABLE 3.11-8/8

EQUIPMENT ITEM NO. 18 (CONTINUED) FUNCTION (PLANT ID): SIS PUMP COLD LEG INJECTION VALVE (FCV 63-22) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/9; TABLE 3.11-8/33 FUNCTION (PLANT ID): SIS BORON INJECTION TANK ISOLATION VALVE (FCV 63-25, -26) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/9; TABLE 3.11-8/33 FUNCTION (PLANT ID): SIS BORON INJECTION INLET ISOLATION VALVE (FCV 63-39. -40) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/9; TABLE 3.11-8/33 FUNCTION (PLANT ID): RWST TO BHP PUMP FLOW CONTROL VALVE (FCV 63-1) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9 FUNCTION (PLANT ID): SIS PUMP DISCHARGE TO RWST SHUTOFF VALVE (FCV 63-3) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9 FUNCTION (PLANT ID): RWST TO SIS PUMP FLOW CONTROL VALVE (FCV 63-5) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9 FUNCTION (PLANT ID): SIS PUMP INLET TO CVCS CHARGING PUMP (FCV 63-6, -7) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9 FUNCTION (PLANT ID): RHR HEAT EXCHANGER TO CVCS CHARGING PUMP (FCV 63-8) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9 FUNCTION (PLANT ID): RHR HEAT EXCHANGER TO SIS PUMP (FCV 63-11) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/9 FUNCTION (PLANT ID): RHR PUMP (A-A, B-B) MINI-FLOW VALVE (FCV 74-12, -24) LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/10; TABLE 3.11-8/34

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING
LIMOTORQUE MODEL SMB; SIZES 00, 1, 2
REQUIRED OPERATING TIME: 1 YEAR
TER CHECKSHEET NO. 19
LICENSEE REFERENCE(S): 662
FUNCTION (PLANT ID): VCT ISOLATION VLAVE (LCV 62-152, -153)
LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-8/11
FUNCTION (PLANT ID): RHR HEAT EXCHANGER (A, B) BYPASS MOV (FCV 74-33, -35)
LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-8/5; TABLE 3.11-6/15
FUNCTION (PLANT ID): VCT ISOLATION VALVES (LCV 62-132, -133)
LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-6/22

EQUIPMENT ITEM NO. 20
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (GENERAL SPACES)
LIMOTORQUE MODEL SMB; SIZE 00
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 20
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): ISOLATION VALVE FLOW CONTROL (FCV 87-21, -24)
LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-6/29



EQUIPMENT ITEM NO. 19

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (GENERAL SPACES)

LIMOTORQUE MODEL SMB; SIZE 00

REQUIRED OPERATING TIME: 2 MONTHS

TER CHECKSHEET NO. 21

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): ISOLATION VALVE FLOW CONTROL (FCV 87-22, -23)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-6/29

EQUIPMENT ITEM NO. 22

MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING, INDIVIDUALLY COOLED ROOMS

LIMOTORQUE MODEL SMB; SIZE 00

REQUIRED OPERATING TIME: 1 MONTH

TER CHECKSHEET NO. 22

LICENSEE REFERENCE(S): 662

FUNCTION (PLANT ID): EMERGENCY BORATION FLOW CONTROL VALVE (FCV 62-138)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-7/11; TABLE 3.11-8/7

EQUIPMENT ITEM NO. 23

MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT (LOWER)

LIMOTORQUE MODEL SMB; SIZES 00, 2, 3

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 23

LICENSEE REFERENCE(S): 637, 639, 721

FUNCTION (PLANT ID): SEAL FLOW ISOLATION VALVE (FCV 62-61)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-4/12

FUNCTION (PLANT ID): SIS ACCUMULATOR TANK FLOW ISOLATION VALVE (FCV 63-67,

-80, -98, -118)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-4/12

FUNCTION (PLANT ID): RHR INJECTION OR RECIRCULATION AFTER LOCA VALVE (FCV

63-172)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-4/12; TABLE 3.11-4-2/1

EQUIPMENT ITEM NO. 24

MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT

LIMOTORQUE MODEL SMB; SIZE 1

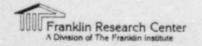
REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 24

LICENSEE REFERENCE(S): 637, 639, 721

FUNCTION (PLANT ID): RHR ISOLATION VALVE A AND B TRAIN (FCV 74-1, -2)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-4/18



EQUIPMENT ITEM NO. 25 MOTORIZED VALVE ACTUATOR LOCATED IN THE CONTAINMENT LIMOTORQUE MODEL SMB: SIZE 00 REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 25

LICENSEE REFERENCE(S): 637, 639, 721

FUNCTION (PLANT ID): RCS PRESSURIZER RELIEF VALVE (FCV 68-332, -333)

LICENSEE SUBMITTAL: SCEW(S): TABLE 3.11-4/18

EQUIPMENT ITEM NO. 26 ELECTRIC MOTOR, LOCATION NOT STATED RELIANCE MODEL 3Y362208 REQUIRED OPERATING TIME: 1 YEAR TER CHECKSHEET NO. 26 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): EMERGENCY GAS TREATMENT FAN MOTOR

SERVICE: EMERGENCY GAS TREATMENT

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-3 (3.11-7, PAGE 7)

EQUIPMENT ITEM NO. 27 ELECTRIC MOTOR LOCATED IN THE CONTAINMENT, LOWER COMPARTMENT RELIANCE MODEL X-328203 REQUIRED OPERATING TIME: 1 YEAR TER CHECKSHEET NO. 27 LICENSEE REFERENCE(S): 1559, 5884

FUNCTION (PLANT ID): CONTAINMENT AIR RETURN FAN MOTOR (30-1AAA, 30-1BBB)

SERVICE: CONTAINMENT AIR RETURN

LICENSEE SUBMITTAL: SCEW(S): (3.11-4 PAGE 8) NEB-ECS-1

EQUIPMENT ITEM NO. 28 ELECTRIC MOTOR, LOCATION NOT STATED LINCOLN MODEL T2557 REQUIRED OPERATING TIME: 1 MONTH TER CHECKSHEET NO. 28 LICENSEE REFERENCE(S): NOT CITED FUNCTION (PLANT ID): CONTAINMENT SPRAY PUMP AHU MOTOR SERVICE: CONTAINMENT SPRAY LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-2 (3.11-7 PAGE 7) EQUIPMENT ITEM NO. 29
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING
LINCOLN MODEL T2523

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 29

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PENETRATION ROOM COOLER MOTOR

SERVICE: PENETRATION ROOM COOLING

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-4 (3.11-7 PAGE 7)

EQUIPMENT ITEM NO. 30
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BLUDING
LINCOLN MODEL T2518
REQUIRED OPERATING TIME: 1 YEAR
TER CHECKSHEET NO. 30
LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): RHR PUMP COOLER FAN MOTOR

SERVICE: RHR PUMP COOLER

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-5 (3.11-7 PAGE 6)

EQUIPMENT ITEM NO. 31

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING
LINCOLN MODEL T2518

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 31

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): SIS PUMP COOLER FAN MOTOR

SERVICE: SIS PUMP COOLER

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-6 (3.11-7 PAGE 6)

EQUIPMENT ITEM NO. 32
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING
LINCOLN MODEL T2518
REQUIRED OPERATING TIME: 1 YEAR
TER CHECKSHEET NO. 32

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CENTRIFUGAL CHARGING PUMP COOLER FAN MOTOR

SERVICE: CENTRIFUGAL CHARGING PUMP COOLER FAN

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-7 (3.11-7 PAGE 6)

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL T2556

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 33

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CCS PUMP AND AFP PUMP AHU MOTOR

SERVICE: CCS PUMP AND AFP PUMP AHU

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-8 (3.11-6 PAGE 11)

EQUIPMENT ITEM NO. 34

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

RELIANCE MODEL 3Y362208

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 34

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GAS TREATMENT SYSTEM FAN MOTOR

SERVICE: AUXILIARY BUILDING GAS TREATMENT SYSTEM

LICENSEE SUBMITTAL: SCEW(S): NEB-FCS-9 (3.11-6 PAGE 11)

EQUIPMENT ITEM NO. 35

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE MODEL 76D55052

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 35

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): 480V BOARD ROOM AHU MOTOR

SERVICE: 480 V BOARD ROOM AHU

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-10 (3.11-6 PAGE 11)

EQUIPMENT ITEM NO. 36

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL T2518

REQUIRED OPERATING TIME: 1 YEAR

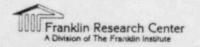
TER CHECKSHEET NO. 36

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): EMERGENCY GAS TREATMENT AHU MOTOR

SERVICE: EMERGENCY GAS TREATMENT AHU

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-11 (3.11-6 PAGE 10)



ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL T2523

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 37

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): SPENT FUEL PIT PUMP AHU MOTOR

SERVICE: SPENT FUEL PIT PUMP AHU

LICENSEE SUBMITTAL: SCEW(S): NEB-ECS-12 (3.11-6 PAGE 10)

EQUIPMENT ITEM NO. 38

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN MODEL TDUP

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 38

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): BORIC ACID TRANSFER PUMP A-A AND B-B MOTOR (MTRB-62-230A

AND 232B)

SERVICE: BORIC ACID TRANSFER PUMP

LICENSEE SUBMITTAL: SCEW(S): NEB-62-38 (3.11-7 PAGE 18, 3.11-8 PAGE 5)

EQUIPMENT ITEM NO. 39

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE MODEL 5809P24

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 39

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): RHR PUMP 1A-A, 1B-B, MOTOR (MTRA-74-10A,-74-20B)

SERVICE: RHR PUMP

LICENSEE SUBMITTAL: SCEW(S): NEB-74-39 (3.11-7 PAGE 28, 3.11-8 PAGE 41)

EQUIPMENT ITEM NO. 40

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, EL. 714'

WESTINGHOUSE MODEL TBDP

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 40

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): SPENT FUEL PIT PUMP MOTOR (MTRD-78-35T, 12A, 9B)

SERVICE: SPENT FUEL PIT PUMP

LICENSEE SUBMITTAL: SCEW(S): NEB-78-42 (3.11-8 PAGE 24, 3.11-7 PAGE 16)

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING, EL. 690'

ALLIS-CHALMERS MODEL 30R56

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 41

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY FEED PUMP MOTOR (1A-A, 1B-B, 2A-A, 2B-B)

SERVICE: AUXILIARY FEED PUMP

LICENSEE SUBMITTAL: SCEW(S): MEB-3-003

EQUIPMENT ITEM NO. 42

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

LINCOLN, MODEL NOT STATED

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 42

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): EL734 A/C PUMP MOTOR (A-A, B-B)

SERVICE: EL. 734 A/C PUMP

LICENSEE SUBMITTAL: SCEW(S): MEB-31-001

EQUIPMENT ITEM NO. 43

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

GENERAL ELECTRIC MODEL 5K256AN205

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 43

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY AIR COMPRESSOR MOTOR (A-A, B-B)

SERVICE: AUXILIARY AIR COMPRESSOR

LICENSEE SUBMITTAL: SCEW(S): MEB-32-002 (3.11-6 PAGE 14, 3.11-8 PAGE 25)

EQUIPMENT ITEM NO. 44

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

SIEMENS-ALLIS, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

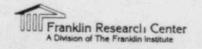
TER CHECKSHEET NO. 44

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): COMPONENT COOLING WATER PUMP MOTOR

SERVICE: COMPONENT COOLING WATER FROM P

LICENSEE SUBMITTAL: SCEW(S): MEB-70-024



ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE MOEL HSW1

REQUIRED OPERATING TIME: 1 MONTH

TER CHECKSHEET NO. 45

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT SPRAY PUMP MOTOR (1AA, 1BB)

SERVICE: CONTAINMENT SPRAY PUMPS

LICENSEE SUBMITTAL: SCEW(S): MEB-72-025 (3.11-7 PAGE 7)

EQUIPMENT ITEM NO. 46

ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE MODEL 052H4-SBDP-MKB

REQUIRED OPERATING TIME: 5 MINUTES

TER CHECKSHEET NO. 46

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CENTRIFUGAL CHARGING PUMP OIL PUMP MOTOR (MTRB-62-108A-A

-104A-B)

SERVICE: OIL PUMP MOTOR

LICENSEE SUBMITTAL: SCEW(S): NEB-62-40 (3.11-7 PAGE 28)

EQUIPMENT ITEM NO. 47

HANDSWITCH LOCATED IN THE AUXILIARY BUILDING

CUTLER-HAMMER MODEL 10250T

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 47

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): LOCAL CONTROL (VARIOUS)

SERVICE: VARIOUS

LICENSEE SUBMITTAL: SCEW(S): EEB-HS-1 (3.11-6 PAGE 1, 16a, 3.11-7 PAGE 12a,

3.11-8 PAGE 2b, c, d, 3c, 4c, 5, 5b, 5c, 5d,

53, 6, 6b, 6c, 7b, 9b, 9c)

EQUIPMENT ITEM NO. 48

HANDSWITCH LOCATED IN THE CONTAINMENT

CUTLER-HAMMER MODEL 10250T

REQUIRED OPERATING TIME: NOT REQUIRED

TER CHECKSHEET NO. 48

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): LOCAL CONTROL (VARIOUS)

SERVICE: VARIOUS

LICENSEE SUBMITTAL: SCEW(S): EEB-HS-1 (3.11-4 PAGE 9, 21a, 21b; 3.11-5 PAGE

5a, 5b)

TRANSFER SWITCH LOCATED IN THE AUXILIARY BUILDING

ELECTRO SWITCH MODEL SERIES 24

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 49

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): TRANSFER SWITCH (VARIOUS)

SERVICE: VARIOUS

LICENSEE SUBMITTAL: SCEW(S): FEB-XS-1 (3.11-6 PAGE 1, 12; 3.11-8 PAGE 2)

EQUIPMENT ITEM NO. 50

DIFFERENTIAL PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

BARTON MODEL 288

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 50

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): NOT STATED (FIS-70-81, PDIS-313-305, PDIS-313-340)

SERVICE: NOT STATED

LICENSEE SUBMITTAL: SCEW(S): EEB-1012 (3.11-7 PAGE 2, 3.11-6 PAGE 3, 3.11-8

PAGE 20, 27)

EQUIPMENT ITEM NO. 51

PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 3301

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 51

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING HIGH PRESSURE (PDIS-30-148, 149)

SERVICE: AUXILIARY BUILDING PRESSURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1007 (3.11-6 PAGE 3, 3.11-8 PAGE 25)

EQUIPMENT ITEM NO. 52

PRESSURE SWITCH LOCATED IN THE WEST VALVE VAULT

BARTON MODEL 288

REQUIRED OPERATING TIME: 1 YEAR

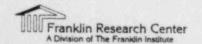
TER CHECKSHEET NO. 52

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY FEED PUMP ISOLATION (PDIS-1-17, 18)

SERVICE: FEED PUMP ISOLATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1030 (3.11-8 PAGE 3b)



FLOW SWITCH LOCATED IN THE AUXILIARY BUILDING ELEV. 653'

BARTON MODEL 288

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 53

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): RHR PUMP MINIMUM FLOW SWITCH (FIS-74-12, 24)

SERVICE: RHR PUMP FLOW

LICENSEE SUBMITTAL: SCEW(S): NEB-74-35 (3.11-6 PAGE 19, 3.11-8 PAGE 10)

EQUIPMENT ITEM NO. 54

PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

CUSTOM COMPONENT MODEL 604G

REQUIRED OPERATING TIME:

TER CHECKSHEET NO. 54

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY COMPRESSOR LOW AIR PRESSURE (PS-32-62, 82, 85, 88)

SERVICE: LOW AIR PRESSURE ISOLATION

LICENSEE SUBMITTAL: SCEW(S): EER-1016 (3.11-6 PAGE 1, 3.11-8 PAGE 26)

FUNCTION (PLANT ID): AUXILIARY FEEDWATER PIPE BREAK DETECTION (PS-3-140A,

150A)

SERVICE: PIPE BREAK DETECTION

LICENSEE SUBMITTAL: SCEW(S): EEB-1016 (311-7 PAGE 1, 3.11-8 PAGE 26)

FUNCTION (PLANT ID): CONDENSATE STORAGE TANK HEADER PRESSURE (PS-3-139A, B,

D; 144A, B, D)

SERVICE: STEAM GENERATOR LEVEL BYPASS

LICENSEE SUBMITTAL: SCEW(S): EEB-1016 (3.11-7 PAGE 18, 3.11-8 PAGE 16)

FUNCTION (PLANT ID): AUXILIARY FEEDWATER PIPE BREAK DETECTION (PS-3-140B)

SERVICE: PIPE BREAK DETECTION

LICENSEE SUBMITTAL: SCEW(S): EEB-1016 (3.11-7 PAGE 27, 3.11-8 PAGE 3b)

FUNCTION (PLANT ID): AUXILIARY FEEDWATER PIPE BREAK DETECTION (PS-3-150B)

SERVICE: PIPE BREAK DETECTION

LICENSEE SUBMITTAL: SCEW(S): EEB-1016 (3.11-7 PAGE 28, 3.11-8 PAGE 3b)

EQUIPMENT ITEM NO. 55

PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 1627

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 55

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): FAN MOTOR INTERLOCK (FS-30-184, 185, 190, 191, 192, 193)

SERVICE: FAN FLOW SWITCH

LICENSEE SUBMITTAL: SCEW(S): MEB-30-018RO (3.11-6 PAGE 1)

FLOW SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 1627

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 56

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PIPE AND PENETRATION ROOM FAN INTERLOCK (FS-30-201)

SERVICE: VENTILATION AIR FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1043 (3.11-7 PAGE 17, 3.11-8 PAGE 32)

EQUIPMENT ITEM NO. 57

FLOW SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 1627

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 57

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PIPE AND PENETRATION ROOM COOLERS FAN (FS-30-186, 187)

SERVICE: FAN FLOW SWITCH

LICENSEE SUBMITTAL: SCEW(S): EEB-1015 (3.11-7 PAGE 17, 3.11-8 PAGE 30)

EQUIPMENT ITEM NO. 58

PRESSURE SWITCH LOCATED IN THE ANNULUS

BARTON MODEL 288A

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 58

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT-ANNULUS PRESSURE (PS-30 -46A, B, 47A, B,

48A, B)

SERVICE: CONTAINMENT/ANNULUS DIFFERENTIAL PRESSURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1027 (3.11-5 PAGE 2)

EQUIPMENT ITEM NO. 59

PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 1627

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 59

LICENSEE REFERENCE(S): NOT CITED

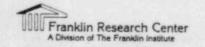
FUNCTION (PLANT ID): FLOW SWITCH - FAN INTERLOCK (FS-30-146, 157, 194, 195,

196, 197, 200, 202, 207)

SERVICE: FAN FLOW SWITCH

LICENSEE SUBMITTAL: SCEW(S): MEB-30-017RO (3.11-7 PAGE 1, 3.11-8 PAGE 6)

EEB-1020



PRESSURE SWITCH LOCATED IN THE AUXILIARY BUILDING

CUSTOM COMPONENTS MODEL 604G

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 60

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONDENSATE STORAGE TANK HEADER PRESSURE (PS-3-148, 156,

164, 171)

SERVICE: STEAM GENERATOR LEVEL BYPASS

LICENSEE SUBMITTAL: SCEW(S): EEB-1031 (3.11-7 PAGE 18, 3.11-8 PAGE 20)

FUNCTION (PLANT ID): AUXILIARY FEED PUMPS OUTLET PRESSURE (PS-3-138A, 138B)

SERVICE: PUMP OUTLET PRESSURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1031 (3.11-6 PAGE 4, 3.11-8 PAGE 1)

FUNCTION (PLANT ID): CONDENSATE DEMINERALIZED WASTE EVAPORATOR BUILDING

SUPPLY (PS-70-209, 210)

SERVICE: DEMINERALIZED WASTES SUPPLY

LICENSEE SUBMITTAL: SCEW(S): EEB-1031 (3.11-6 PAGE 1, 3.11-8 PAGE 22)

EQUIPMENT ITEM NO. 61

DIFFERENTIAL PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING, ELEV. 693'

BAILEY MODEL 555

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 61

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY FEEDWATER PUMPS FLOW TRANSMITTER (FT-3-142)

SERVICE: AUXILIARY FEEDWATER FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1032 (3.11-6 PAGE 5, 3.11-8 PAGE 1)

EQUIPMENT ITEM NO. 62

D/P TRANSMITTER LOCATED IN THE AUXILIARY BUILDING

FOXBORO MODEL E13DL

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 62

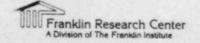
LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT/ANNULUS DIFFERENTIAL PRESSURE (PDT-65-80,

82, 90, 97)

SERVICE: CONTAINMENT/ANNULUS PRESSURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1008 (3.11-7 PAGE 18, 3.11-8 PAGE 6)



D/P TRANSMITTER LOCATED IN THE AUXILIARY BUILDING

BAILEY MODEL 555

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 63

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): THERMAL BARRIER HEADER FLOW (FT-70-81A, B, D)

SERVICE: THERMAL BARRIER FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1004 (3.11-7 PAGE 6, 3.11-8 PAGE 6, 31) FUNCTION (PLANT ID): THERMAL ROOM BARRIER SUPPLY HEADER FLOW (FT-70-81E)

SERVICE: SUPPLY HEADER FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1004 (3.11-7 PAGE 16, 3.11-8 PAGE 28)

EQUIPMENT ITEM NO. 64

FLOW TRANSMITTER LOCATED IN THE AUXILIARY BUILDING

BAILEY MODEL 555

REQUIRED OPERATING TIME: 1 MONTH

TER CHECKSHEET NO. 64

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT SPRAY HEADER A&B FLOW (FT-72-13, 34)

SERVICE: CONTAINMENT SPRAY FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1034 (3.11-7 PAGE 15)

EQUIPMENT ITEM NO. 65

D/P TRANSMITTER LOCATED IN THE LOWER CONTAINMENT

BARTON MODEL 764 LOT 2

REQUIRED OPERATING TIME: 4 MONTHS

TER CHECKSHEET NO. 65

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM FLOW TRANSMITTER (FT-1-3A, B, 10A, B, 21A, B, 28A,

B)

SERVICE: STEAM FLOW

LICENSEE SUBMITTAL: SCEW(S): NEB-1-8 (3.11-4 PAGE 15)

EQUIPMENT ITEM NO. 66

PRESSURE CONTROLLER LOCATED IN THE AUXILIARY BUILDING

JOHNSON CONTROLS MODEL PL-4000-2

REQUIRED OPERATING TIME: 1 YEAR

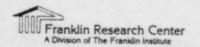
TER CHECKSHEET NO. 66

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUX BLDG GAS TREATMENT FAN A-A & B-B (FC-30-148, 149)

SERVICE: FLOW CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-1047 (3.11-6 PAGE 18, 3.11-8 PAGE 24)



SIGNAL CONVERTER LOCATED IN THE AUXILIARY BUILDING

TRANSMATION MODEL SW123-1T

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 67

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUX BLDG GAS TREATMENT FAN CONTROL (FM-30-148A, 149A)

SERVICE: FAN CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-1010 (3.11-6 PAGE 5, 3.11-8 PAGE 25)

EQUIPMENT ITEM NO. 68

AIR DRYERS LOCATED IN THE AUXILIARY BUILDING

PALL TRINITY MODEL 101HA1-6HD9810-331

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 68

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): ESSENTIAL CONTROL AIR DRYERS A & B

SERVICE: CONTROL AIR DRYER

LICENSEE SUBMITTAL: SCEW(S): EEB-1005 (3.11-6 PAGE 22, 3.11-8 PAGE 25)

EQUIPMENT ITEM NO. 69

DISTRIBUTION PANEL, LOCATION NOT STATED

POWER ELECTRIC MODEL CCB

REQUIRED OPERATING TIME: 1 WEEK

TER CHECKSHEET NO. 69

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PRESSURIZER HEATER DISTRIBUTION PANEL (B/U-1A-A, 1B-B,

1C, 1D)

SERVICE: PRESSURIZER HEATER CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-0003 (3.11-6 PAGE 13)

EQUIPMENT ITEM NO. 70

TURBINE CONTROL PANEL LOCATED IN THE AUXILIARY BUILDING

TERRY MODEL GS-2

REQUIRED OPERATING TIME: 1 YEAR

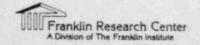
TER CHECKSHEET NO. 70

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUX FEED PUMP TURBINE CONTROL PANEL (PANEL-326, -381)

SERVICE: ELECTRO MECHANICAL TURBINE GOVERNOR CONTROL

LICENSEE SUBMITTAL: SCEW(S): MER-3-001RO (3.11-6 PAGE 12)



CONTROL PANEL LOCATED IN THE AUXILIARY BUILDING

INGERSOLL-RAND MODEL 7X4 ESV-1P-NL-2

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 71

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY CONTROL AIR CONTROL PANEL

SERVICE: COMPRESSOR CONTROL

LICENSEE SUBMITTAL: SCEW(S): MEB-32-001-RO (3.11-6 PAGE 4)

EQUIPMENT ITEM NO. 72

ELECTRIC HEATER LOCATED IN THE CONTAINMENT

E. L. WRIGAN MODEL 04265379001

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 72

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): BACK UP PRESSURIZER HEATER ELEMENTS (VARIOUS)

SERVICE: PRESSURIZER HEATER ELEMENTS

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-48 (3.11-4 PAGE 21)

EQUIPMENT ITEM NO. 73

TRANSDUCER LOCATED IN THE AUXILIARY BUILDING

ITT HAMMEL DAHL MODEL T-25

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 73

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GAS TREATMENT FAN (FM-30-148, -149)

SERVICE: FAN CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-1009 (3.11-6 PAGE 5, 3.11-3 PAGE 25)

EQUIPMENT ITEM NO. 74

I/P TRANSDUCER LOCATED IN THE AUXILIARY BUILDING

MASONETLAN MODEL 8005

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 74

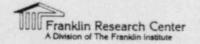
LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM GENERATOR LEVEL CONTROL (LM-3-148A, -156A, -164A,

-171A)

SERVICE: STEAM GENERATOR LEVEL

LICENSEE SUBMITTAL: SCEW(S): EEB-1038 (3.11-6 PAGE 21, 3.11-8 PAGE 20)



EQUIPMENT ITEM NO. 75

I/P TRANSDUCER LOCATED IN THE AUXILIARY BUILDING ROBERTSHAW MODEL 445-C3

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 75

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MODIFIER (PDM-65-80, -82)

SERVICE: NOT STATED

EQUIPMENT ITEM NO. 76
RELAY PANEL LOCATED IN THE AUXILIARY BUILDING
INTERNATIONAL SWITCHBOARD, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 76

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): REACTOR COOLANT PUMP UNDERVOLTAGE RTLAY BOARDS (1A, 1B, 2A, 2B)

SERVICE: REACTOR COOLANT PUMP UNDERVOLTAGE

LICENSEE SUBMITTAL: SCEW(S): EEB-0001 (3.11-6 PAGE 12)

LICENSEE SUBMITTAL: SCEW(S): EEB-1025 (3.11-6, PAGE 29)

EQUIPMENT ITEM NO. 77

ELECTRIC CABLE SPLICE LOCATED INSIDE AND OUTSIDE CONTAINMENT RAYCHEM MODEL WCSF (N)

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 77

LICENSEE REFERENCE(S): 815

FUNCTION (PLANT ID): CABLE CONNECTION AND TERMINATION LICENSEE SUBMITTAL: SCEW(S): EEB-SPL-1

EQUIPMENT ITM NO. 78

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT AMERICA INSULATED WIRE, MODEL NOT STATED REQUIRED OPERATING TIME: LONG TERM TER CHECKSHEET NO. 78

LICENSEE REFERENCE(S): 6451

FUNCTION (PLANT ID): SROAJ CABLE SERVICE: ELECTRICAL DISTRIBUTION LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-1

EQUIPMENT ITEM NO. 79

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT ROCKBESTOS, MODEL NOT STATED

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 79

LICENSEE REFERENCE(S): 4736, 1327

FUNCTION (PLANT ID): SROAJ AND SROAJ-H

SERVICE: ELECTRICAL DISTRIBUTION

LICENSEE SUBMITTAL: (SCEW(S): EEB-CBL-2 (3.11-4A PAGE 1))

EQUIPMENT ITEM NO. 80

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT
ANACONDA/CONTINENTAL, MODEL NOT STATED
REQUIRED OPERATING TIME: LONG TERM
TER CHECKSHEET NO. 80

LICENSEE REFERENCE(S): 2818, 4651
FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (SROAJ, SROAJ-H)
LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-3

EQUIPMENT ITEM NO. 81

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT ANACONDA/CONTINENTAL, MODEL NOT STATED REQUIRED OPERATING TIME: LONG TERM TER CHECKSHEET NO. 81

LICENJEE REFERENCE(S): 4405

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA & WVC) LICENSEE SUBMITTAL: EEB-CBL-4

EQUIPMENT ITEM NO. 82

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT ROCKBESTOS, MODEL NOT STATED

REQUIRED OPERATING TIME: LONG TERM

TER CHECKSHEET NO. 82

LICENSEE REFERENCE(S): 1155

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA)

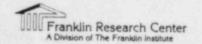
LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-5

EQUIPMENT ITEM NO. 83

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT
ITT SUPERNANT, MODEL NOT STATED
REQUIRED OPERATING TIME: LONG TERM
TER CHECKSHEET NO. 83

LICENSEE REFERENCE(S): 645

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION
LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-6



EQUIPMENT ITEM NO. 84

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT
BRAND REX, MODEL NOT STATED

REQUIRED OPERATING TIME: LONG TERM
TER CHECKSHEET NO. 84

LICENSEE REFERENCE(S): 936

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVC(XLPE))
LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-7

EQUIPMENT ITEM NO. 85

ELECTRICAL CABLE LOCATED OUTSIDE CONTAINMENT
ITT SUPERNANT MODEL TRIAXIAL
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 85

LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): INSTRUMENT CABLE
LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-8

EQUIPMENT ITEM NO. 86

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT
GENERAL ELECTRIC MODEL VULKENE
REQUIRED OPERATING TIME: LONG TERM
TER CHECKSHEET NO. 86

LICENSEE REFERENCE(S): 4764
FUNCTION (PLANT ID): CONTROL & INSTRUMENTATION (CPJ)
LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-9

EQUIPMENT ITEM NO. 87

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT INSTRUMENT CABLE, MODEL NOT STATED REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 87

LICENSEE REFERENCE(S): 4764

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-10

EQUIPMENT ITEM NO. 88

ELECTRICAL CABLE LOCATED INSIDE/OUTSIDE CONTAINMENT
MANUFACTURER AND MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 88

LICENSEE REFERENCE(S): 4764

FUNCTION (PLANT ID): INSTRUMENT CABLE (CPST)

LICENSEE SUBMITTAL: 3CEW(S): EEB-CBL-11

EQUIPMENT ITEM NO. 89

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT OKONITE, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 89

LICENSEE REFERENCE(S): 1858

FUNCTION (PLANT ID): NOT STATED (EPSJ)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-12

EQUIPMENT ITEM NO. 90

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT MANUFACTURER AND MODEL NOT CITED REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 90

LICENSEE REFERENCE(S): 936, 1110, 4767, 1731

FUNCTION (PLANT ID): VARIOUS (PXJ)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-13

EQUIPMENT ITEM NO. 91

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT VARIOUS MANUFACTURERS, MODEL NOT STATED REQUIRED OPERATING TIME: NOT STATED TER CHECKSHEET NO. 91

LICENSEE REFERENCE(S): 1858, 936, 1110, 1802

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (XLPE)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-16

EQUIPMENT ITEM NO. 92

ELECTRICAL CABLES LOCATED INSIDE AND OUTSIDE CONTAINMENT

VARIOUS MANUFACTURERS, MODEL TEFZEL

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 92

LICENSEE REFERENCE(S): 4770

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (SPECIAL CABLE)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-17

EQUIPMENT ITEM NO. 93

ELECTRICAL PENETRATION LOCATED IN THE CONTAINMENT
WESTINGHOUSE TYPES WX-32198 THROUGH -32212
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 93

LICENSEE REFERENCE(S): 4773, 3207, 719, 749
FUNCTION (PLANT ID): PRESSURE BOUNDARY AND ELECTRICAL CONTINUITY
LICENSEE SUBMITTAL: SCEW(S): EEB-PEN-1

EQUIPMENT ITEM NO. 94

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT
MANUFACTURER AND MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 94

LICENSEE REFERENCE(S): 936, 1110, 4767, 1731

FUNCTION (PLANT ID): VARIOUS (PXNJ)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-14

EQUIPMENT ITEM NO. 95

ELECTRICAL CABLE LOCATED IN THE ANNULUS

MANUFACTURER AND MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 95

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (PJJ)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-15

EQUIPMENT ITEM NO. 96

JUNCTION BOX LOCATED INSIDE AND OUTSIDE CONTAINMENT
TVA, MODEL NOT STATED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 96

LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PROTECT ELECTRICAL TERMINATION
LICENSEE SUBMITTAL: 3CEW(S): EEB-JB-1, 2

EQUIPMENT ITEM NO. 97
TERMINAL BLOCK LOCATED INSIDE AND OUTSIDE CONTAINMENT VARIOUS MANUFACTURERS AND MODELS
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NG. 97
LICENSEE REFERENCE(S): 22, 4028
FUNCTION (PLANT ID): ELECTRICAL TERMINATIONS
LICENSEE SUBMITTAL: SCEW(S): EEB-TB-1

EQUIPMENT ITEM NO. 98

TRANSFORMER LOCATED IN THE AUXILIARY BUILDING
WESTINGHOUSE MODEL LIQUID FILLED
REQUIRED OPERATING TIME: NOT STATED
TER CHECKSHEET NO. 98
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): BACKUP PRESSURIZER HEATER POWER SUPPLY
LICENSEE SUBMITTAL: SCEW(S): EEB-002

SOLENOID VALVE LOCATED IN THE CONTAINMENT

AVCO MODEL C5439

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 99

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT AND INSTRUMENT ROOM PURGE VALVES (FSV-30-8,

-10, -50, -52, -15, -17, -40, -56 -20, -58)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-003 (3.11-7 PAGE 4)

EQUIPMENT ITEM NO. 100

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ACVO MODEL C5439

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 100

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PURCE AIR SUPPLY ISOLATION VALVE (FSV-30-2, -5)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-003 (3.11-4 PAGE 1, 3.11-7 PAGE 4)

FUNCTION (PLANT ID): PURGE AIR EXHAUST SUCTION (FSV-30-60, -61)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-003

FUNCTION (PLANT ID): EGTS SUCTION AND DECAY COOLING (FSV-65-7, -8, -28A,

-28B, -47A, -47B, -50, -51)

LICENSEE SUBMITTAL: SCEW(S): MEB-65-002

EQUIPMENT ITEM NO. 101

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 8320A19

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 101

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): DAMPER ACTUATORS (FSV-30-86, -137, -138, -140, -141,

-160, -161, -166, -167, -271, -272, -275, -276)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-036 (3.11-6 PAGE 8)

EQUIPMENT ITEM NO. 102

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL HT8300

REQUIRED OPERATING TIME: 1 YEAR

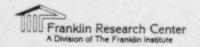
TER CHECKSHEET NO. 102

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): GLYCOL RETURN AND SUPPLY ISOLATION VALVE (FSV-61-192,

-194, -122, -97)

LICENSEE SUBMITTAL: SCEW(S): EEB-1063 (3.11-4 PAGE 19)



SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HT8302B25RF

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 103

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): NOT STATED (FSV-30-129, -130, -106, -107, -122, -123,

-102

LICENSEE SUBMITTAL: SCEW(S): MEB-30-028 (3.11-6 PAGES, 9, 17)

EQUIPMENT ITEM NO. 104

SOLENOID VALVE LOCATED OUTSIDE CONTAINMENT

ASCO MODEL HT8300

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 104

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM GENERATION HEADER PRESSURE CONTROL VALVE (PSVI-6A,

-6B, -31A, -31B)

LICENSEE SUBMITTAL: SCEW(S): MEB-1-037 (3.11-8 PAGES 3, 4)

EQUIPMENT ITEM NO. 105

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HV202300LRV

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 105

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): (FSV-18-12)

LICENSEE SUBMITTAL: SCEW(S): EEB-1060 (3.11-7 PAGE 1)

EQUIPMENT ITEM NO. 106

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HV-200-924-2F

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 106

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING ISOLATION (FSV-12-79)

LICENSEE SUBMITTAL: SCEW(S): EEB-1039 (3.11-6 PAGE 7)

EQUIPMENT ITEM NO. 107

SOLENOID VALVE LOCATED IN THE ANNULUS

ASCO MODEL HTX8320

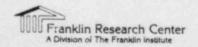
REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 107

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT ISOLATION (FSV-90-107, -111, -113, -117)

LICENSEE SUBMITTAL: SCEW(S): EEB-1037 (3.11-5 PAGE 3)



SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HT8300

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 108

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM GENERATOR LEVEL (LSV-3-148, -156, -164, -171,

-172, -173)

LICENSEE SUBMITTAL: SCEW(S): EEB-1036 (3.11-6 PAGE 7, 3.11-8 PAGES 3, 4.

20, 26)

EQUIPMENT ITEM NO. 109

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL WPX-HV-202-301-1F

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 109

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM GENERATOR LEVEL BYPASS (LSV-3-148A, -156A, -164A,

-171A)

LICENSEE SUBMITTAL: SCEW(S): EEB-1035 (3.11-6 PAGE 8, 3.11-8 PAGE 21)
FUNCTION (PLANT ID): REACTOR BUILDING SUMP DISCHARGE FLOW (FSV-77-128)

LICENSEE SUBMITTAL: SCEW(S): EEB-1035 (3.11-7 PAGE 3, 3.11-8 PAGE 34)

EQUIPMENT ITEM NO. 110

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HB8300

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 110

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PIPE CHASE AND PENETRATION ROOM COOLER CONTROL VALVES

(FSV-67-338, -344, -346, -348, -350, -352, -342;

FSV-70-85)

LICENSEE SUBMITTAL: SCEW(S): EEB-1029

EQUIPMENT ITEM NO. 111

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HB8300

REQUIRED OPERATING TIME: 1 YEAR

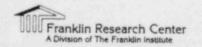
TER CHECKSHEET NO. 111

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PILOT VALVE (FSV-67-168, -170, -176, -182, -184, -186,

-188, -190, -213, -215, -354, -356)

LICENSEE SUBMITTAL: SCEW(S): EEB-1029



SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HV-200-921-1RF

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 112

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PILOT VALVE (2-FSV-67-184)

LICENSEE SUBMITTAL: SCEW(S): EEB-1029

EQUIPMENT ITEM NO. 113

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODELS 8300 AND 8302

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 113

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GAS TREATMENT FAN FLOW CONTROL

(FSV-30-279, 280)

LICENSEE SUBMITTAL: SCEW(S): 3.11-688

FUNCTION (PLANT ID): GLYCOL RETURN ISOLATION VALVE (FSV-61-191A, -193A, -96,

-110)

LICENSEE SUBMITTAL: SCEW(S): 3.11-6S17

EQUIPMENT ITEM NO. 114

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 831654 (SOME WITHOUT NAMEPLATE)

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 114

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): REACTOR COOLANT DRAIN TANK NITROGEN SUPPLY (FSV-77-20)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): BORIC ACID BLENDER (FSV-62-143)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): MAKEUP INJECTION VALVE (FSV-62-144)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): CVCS BYPASS FLOW (FSV-62-120); BORIC ACID TRANSFER PUMP

TO BORON INJECTION TANK (FSV-63-38)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

EQUIPMENT ITEM NO. 115

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 831654

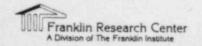
REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 115

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): TEST LINE ISOLATION VALUE (FSV-87-9, -10)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27



EQUIPMENT ITEM NO. 115 (CONTINUED)

FUNCTION (PLANT ID): LETDOWN LINE ISOLATION VALVE (FSV-62-77)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): RCS FLOW CONTROL VALVES (FSV-68-305)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): SIS ACCUMULATOR VALVE (FSV-63-23, -64)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): SIS CHECK VALVE (FSV-63-84)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

FUNCTION (PLANT ID): SIS BORON INJECTION TANK TO CVCS BORIC ACID TANK VALVES

(FSV-63-41, -42)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

EQUIPMENT ITEM NO. 116

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL LB8300B64RU

REQUIRED OPERATING TIME: CONTINUOUS

TER CHECKSHEET NO. 116

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): BORIC ACID TO BLENDER (FSV-62-140A, B)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

EQUIPMENT ITEM NO. 117

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HT831654 (NOT STATED UNIT 1)

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 117

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): TEST LINE ISOLATION VALVE (FSV-87-11)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-27

EQUIPMENT ITEM NO. 118

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL LB831654

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 118

LICENSEE REFERENCE(S): 1617

FUNCTION (PLANT ID): PRESSURIZER POWER RELIEF VALVE TRAIN A & B (PSV-68-334A,

B, -340AA, AB)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-47

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL LB831654

REQUIRED OPERATING TIME: 10 SECONDS

TER CHECKSHEET NO. 119

LICENSEE REFERENCE(S): 1617

FUNCTION (PLANT ID): LET DOWN ISOLATION (FSV-62-74)

LICFNSEE SUBMITTAL: SCEW(S): NEB-XX-47

FUNCTION (PLANT ID): BC LOOP 3 LTD FLOW (FSV-62-70)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-47

EQUIPMENT ITEM NO. 120

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL HB8300C58RU

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 120

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PIPECHASE & PENETRATION ROOM COOLER CONTROL VALVE

FSV-67-336, -338); NOT STATED (FSV-67-217, -219)

LICENSEE SUBMITTAL: SCEW(S): EEB-1048-2

EQUIPMENT ITEM NO. 121

SOLENOID VALVE LOCATED IN THE LOWER CONTAINMENT

ASCO MODEL HT8300 SERIES/WPXHV2023011

REQUIRED OPERATING TIME: 10 SECONDS

TER CHECKSHEET NO. 121

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): STEAM GENERATOR BLOWDOWN (FSV-1-181, -182, -183, -184)

LICENSEE SUBMITTAL: SCEW(S): EEB-1019

FUNCTION (PLANT ID): REACTOR BUILDING SUMP DISCHARGE (FSV-77-127)

LICENSEE SUBMITTAL: SCEW(S): EEB-1019

FUNCTION (PLANT ID): CONTAINMENT BUILDING LOWER COMPARTMENT (FSV-90-108,

-109, -110)

LICENSEE SUBMITTAL: SCEW(S): EEB-1019

FUNCTION (PLANT ID): CONTAINMENT BUILDING UPPER COMPARTMENT (FSV-90-114,

-115, -116)

LICENSEE SUBMITTAL: SCEW(S): EEB-1019

EQUIPMENT ITEM NO. 122

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 8320

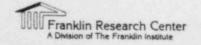
REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 122

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): DAMPER ACTUATOR (FSV-65-10)

LICENSEE SUBMITTAL: SCEW(S): MEB-65-023



EQUIPMENT ITEM NO. 122 (CONTINUED)

FUNCTION (PLANT ID): ISOLATION VALVE (FSV-30-3, -6, -60, -69)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-020

FUNCTION (PLANT ID): AUXILIARY BUILDING GAS TREATMENT FAN DAMPERS

(FSV-30-146A, 146B)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-019

EQUIPMENT ITEM NO. 123

SOLENOID VALVE LOCATED OUTSIDE CONTAINMENT

ASCO MODEL 8300

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 123

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PILOT VALVES (FSV1-7, -14, -25, -32, -147, -150, -148,

-149)

LICENSEE SUBMITTAL: SCEW(S): EEB-1036

EQUIPMENT ITEM NO. 124

SOLENGID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL 206-381-3RF

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 124

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): REACTOR COOLANT DRAIN TANK TO VENT HEADER (FSV-77-18);

REACTOR COOLANT DRAIN FLOW CONTROL (FSV-77-9)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-46

EQUIPMENT ITEM NO. 125

SOLENOID VALVE LOCATED IN THE ANNULUS

ASCO MODEL 206-381-3RF

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 125

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): RCS FLOW CONTROL VALVE (FSV-68-307)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-46

EQUIPMENT ITEM NO. 126

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL NP831654E

REQUIRED OPERATING TIME: 10 SECONDS

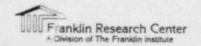
TER CHECKSHEET NO. 126

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): TEST LINE ISOLATION VALVE (FSV-87-7, -8); LET DOWN

ISOLATION VALVE (FSV-62-72, -73)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-43



SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL 206-381-3RF

REQUIRED OPERATING TIME: 10 SECONDS

TER CHECKSHEET NO. 127

LICENSEE REFERENCE(S): 648

FUNCTION (PLANT ID): REACTOR COOLANT DRAIN TANK TO GAS ANALYSIS (FSV-77-16)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-43

EQUIPMENT ITEM NO. 128

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 206-381-3RF

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 128

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): DAMPER ACTUATOR (FSV-65-52, -53, -30, -26, -27)

LICENSEE SUBMITTAL: SCEW(S): MEB-65-022

FUNCTION (PLANT ID): NOT STATED (FSV-30-157B)

LICENSEE SUBMITTAL: SCEW(S): MEB-30-021

EQUIPMENT ITEM NO. 129

SOLENOID VALVE LOCATED IN THE ANNULUS

ASCO MODEL HV-206-380-2RVU

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 129

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): NOT STATED (FSV-32-81A, B; -103A, -111A, B; -103B)

LICENSEE SUBMITTAL: SCEW(S): MEB-65-022 (3.11-7 PAGE 4)

EQUIPMENT ITEM NO. 130

SOLENOID VALVE LOCATED IN THE ANNULUS

ASCO MODELS 206-380 AND 206-381

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 130

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): NOT STATED (PSV-65-81, -83); REACTOR BUILDING ISOLATION

(FSV-32-80A, B; -102A, B; -110A, B); CONTAINMENT ISOLATION (FSV-43-77, -3, -12, -23, -35); RCS FLOW

CONTROL (FSV-68-308)

LICENSEE SUBMITTAL: SCEW(S): EEB-1020

SOLENOID VALVE LOCATED OUTSIDE CONTAINMENT

ASCO MODEL 206-381

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 131

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): NOT STATED (LSV-3-175), SG LEVEL SOV (LSV-3-174);

RC DRAIN TANK TO DRAIN HEADER (FSV-77-17, -19, -10)

LICENSEE SUBMITTAL: SCEW(S): EEB-1020

EQUIPMENT ITEM NO. 132

SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING

ASCO MODEL 206-381-3RF

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 132

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): DAMPER ACTUATOR (FSV-65-52, -53, -30, -26, -27)

LICENSEE SUBMITTAL: SCEW(S): EEE-1020

EQUIPMENT ITEM NO. 133

SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL 206-381

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 133

LICENSEE REFERENCE(S): 649

FUNCTION (PLANT ID): CONTAINMENT HYDROGEN MONITORING (FSV-43-201, -202);

PRESSURIZER GAS/LIQUID (FSV-43-2, -11); RCS HOT LEGS (FSV-43-22); ACCUMULATOR TANK HEADER (FSV-43-34); EXCESS

LETDOWN HEAT EXCHANGER (FSV-43-74); NOT STATED

(FSV-68-308)

LICENSEE SUBMITTAL: SCEW(S): EEB-1020

EQUIPMENT ITEM NO. 134

SOLENOID VALVE LOCATED IN THE CONTAINMENT

TARGET ROCK MODEL 775001

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 134

LICENSEE REFERENCE(S): 1564

FUNCTION (PLANT ID): DP ISOLATION VALVE (FSV-30-134, 135)

LICENSEE SUBMITTAL: SCEW(S): EEB-1001

LIMIT SWITCH LOCATED IN THE ANNULUS

NAMCO MODEL EA170

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 135

LICENSEE REFERENCE(S): 1530, 4752

FUNCTION (PLANT ID): POSITION INDICATION (FLV-90-107, -111, -113, -117;

FCV-12-79)

LICENSEE SUBMITTAL: SCEW(S): EEB-1058 (3.11-5 PAGES 8, 9; 3.11-6 PAGE 24;

3.11-8 PAGE 36)

EQUIPMENT ITEM NO. 136

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA-170-302

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 136

LICENSEE REFERENCE(S): 4752, 1530

FUNCTION (PLANT ID): POSITION INDICATION (FCV-87-9, -10, -11)

LICENSEE SUBMITTAL: SCEW(S): NEB-87-45 (TABLE 3.11-6, PAGES 27, 28)

EQUIPMENT ITEM NO. 137

LIMIT SWITCH LOCATED IN THE CONTAINMENT

NAMCO MODEL EA-180

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 137

LICENSEE REFERENCE(S): 3293

FUNCTION (PLANT 1D): POSITION INDICATION (VARIOUS)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): MEB-313-045, EEB-1051 (3.11-4 PAGE 23, 24, 26,

27, 28)

EQUIPMENT ITEM NO. 138

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA180

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 138

LICENSEE REFERENCE(S): 3293

FUNCTION (PLANT ID): CONTAINMENT SUMP ISOLATION VALVE (FCV-63-72, -73)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-50 (3.11-7 PAGE 11)

LIMIT SWITCH LOCATED IN THE CONTAINMENT

NAMCO MODEL EA180

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 139

LICENSEE REFERENCE(S): 3293

FUNCTION (PLANT ID): CONTAINMENT ISOLATION VALVES (FCV-62-72, -73, -74,

FCV-77-16, FCV-87-7, -8)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1062 (3.11-4 PAGES 26, 27)

EQUIPMENT ITEM NO. 140

LIMIT SWITCH LOCATED IN THE ANNULUS

MICRO SWITCH MODEL OPDAR7905

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 140

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): ANNULUS ISOLATION VALVES (NOT DEFINED)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): MEB-313-039 (3.11-5 PAGE 8)

EQUIPMENT ITEM NO. 141

LIMIT SWITCH LOCATED IN THE ANNULUS

NAMCO MODEL EA700

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 141

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): REACTOR BUILDING ISOLATION (NOT DEFINED)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1057 (3.11-5 PAGE 7)

EQUIPMENT ITEM NO. 142

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA700

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 142

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): UNIT 1 SHIELD BUILDING EXHAUST (NOT DEFINED)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): MEB-65-032R1 (3.11-7 PAGES 22, 23)

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA700

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 143

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): VALVE POSITION INDICATION (FCV-1-149, -148, -147, -150,

-14, -32, -7, -25)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1056 (3.11-8 PAGES 39, 40)

EQUIPMENT ITEM NO. 144

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA170

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 144

LICENSEE REFERENCE(S): 1530, 4750

FUNCTION (PLANT ID): POSITION INDICATION (FCV-65-47A, B, 28A, B, 8, 51,

FCO-65-10, 30, 52, 53)

LICENSEE SUBMITTAL: SCEW(S): MEB-65-041 (3.11-7 PAGES 22, 23)

EQUIPMENT ITEM NO. 145

LIMIT SWITCH LOCATED IN VARIOUS LOCATIONS

NAMCO MODEL EA-170

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 145

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POSITION INDICATION (FCV-61-96, 110, 191-193;

FCV-62-128, -140, -143, -144, -69, -70, -77; FCV-63-3,

-4, -8, -11, -23, -38, -41, -42, -64, -84, -175;

FCV-68-305, -307; FCV-74-3, -21; FCV-77-10, -17, -19, -20; FCV-87-21, -22, -23, -24; ZS-63-1, -67, -80, -98.

-118, -5)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-44

EQUIPMENT ITEM NO. 146

LIMIT SWITCH LOCATED IN THE CONTAINMENT

NAMCO MODEL EA740

REQUIRED OPERATING TIME: 1 YEAR

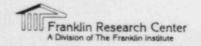
TER CHECKSHEET NO. 146

LICENSEE REFERENCE(S): 4755, 5401

FUNCTION (PLANT ID): VALVE POSITION INDICATION (FCV-77-127)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1018 (3.11-4 PAGE 25)



LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA740

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 147

LICENSEE REFERENCE(S): 4755, 5401

FUNCTION (PLANT ID): VALVE POSITION INDICATION (FCV-77-128)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1018 (3.11-7 PAGE 25, 3.11-8 PAGE 38)

EQUIPMENT TIEM NO. 148

RADIATION MONITOR LOCATED IN THE AUXILIARY BUILDING

GENERAL ATOMIC, MODEL NOT STATED

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 148

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): EXHAUST MONITOR (RE-90-130, -131)

SERVICE: CONTAINMENT PURGE

LICENSEE SUBMITTAL: SCEW(S): EEB-1003 (TABLES 3.11-8/7 & 3.11-7/17)

FUNCTION (PLANT ID): RADIATION MONITOR (RE-90-102, -103)

SERVICE: FUEL POOL

LICENSEE SUBMITTAL: SCEW(S): EEB-1003 (TABLES 3.11-6/10 & 3.11-8/26)

FUNCTION (PLANT ID): RADIATION MONITOR (RE-90-106, -112)

SERVICE: SCEW(S): NOT STATED

LICENSEE SUBMITTAL: SCEW(S): EEB-1003 (TABLES 3.11-6/10 & 3.11-8/24)

FUNCTION (PLANT ID): LIQUID MONITOR (RE-90-140, -141)

SERVICE: ERCW

FUNCTION (PLANT ID): LIQUID MONITOR (RE-90-133, 134)

SERVICE: ERCW

LICENSEE SUBMITTAL: SCEW(S): EEB-1003 (TABLES 3.11-6/18 & 3.11-8/29)

EQUIPMENT ITEM NO. 149

PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING CORRIDOR, EL. 690'0" BAILEY MODEL 556

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 149

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY FW PUMP OUTLET PRESSURE (PT-3-132A) LICENSEE SUBMITTAL: SCEW(S): EEB-1024 (TABLES 3.11-7/18 & 3.11-8/16)

LEVEL SWITCH LOCATED IN THE AUXILIARY BUILDING OPEN AREA, EL. 714'0"

MERCOID MODEL 203G7810C1160

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 150

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): A&B COMPRESSOR TANK B-B LOW LEVEL (LS-313-305)

LICENSEE SUBMITTAL: SCEW(S): MEB 313-042 (TABLES 3.11-6/20 AND 3.11-8/19)

FUNCTION (PLANT ID): A & B DW SUPPLY SHUTOFF (LS-313-340)

LICENSEE SUBMITTAL: SCEW(S): MEB 313-042 (TABLES 3.11-6/20 AND 3.11-8/19)

EQUIPMENT ITEM NO. 151

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

PENN MODEL A19BAC

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 151

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): FAN INTERLOCK (TS-30-190, 191, 192, 193)

LICENSEE SUBMITTAL: SCEW(S): EEB-1014 (TABLE 3.11-6/2)

FUNCTION (PLANT ID): FAN INTERLOCK (TS-30-175, 176, 177, 178, 179, 180, 182,

183, 186, 187, 196, 197, 201, 202)

LICENSEE SUBMITTAL: SCEW(S): EEB-1014 (TABLE 3.11-7/1)

FUNCTION (PLANT ID): PENETRATION ROOM COOLER A&B (TS-30-194, 195)

LICENSEE SUBMITTAL: SCEW(S): EEB-1014 (TABLE 3.11-8/6)

EQUIPMENT ITEM NO. 152

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

HONEYWELL MODEL T675A1540

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 152

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): SUPPLY FAN INTAKE TEMPERATURE (TS-30-103A)

SERVICE: AUXILIARY BUILDING VENTILATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1006 (TABLE 3.11-6/2)

EQUIPMENT ITEM NO. 153

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

FENWAL MODEL 27120-50

REQUIRED OPERATING TIME: 10 MINUTES

TER CHECKSHEET NO. 153

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING STEAM LINE RUPTURE (TS-12-91A, -91B,

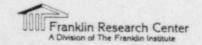
-92A, -92B, -99A, -99B)

LICENSEE SUBMITTAL: SCEW(8): EEB-1022 (TABLE 3.11-6/2)

FUNCTION (PLANT ID): AUXILIARY BUILDING STEAM LINE DETECTION (TS-12-96B,

-97A, -97B, -98A, -98B)

LICENSEE SUBMITTAL: SCEW(S): EEB-1022 (TABLES 3.11-6/2 AND 3.11-8/10)



EQUIPMENT ITEM NO. 153 (CONTINUED)

FUNCTION (PLANT ID): AUXILIARY BUILDING STEAM LINE DETECTION (TS-12-94A,

-94B, -95A, -95B, -96A)

FUNCTION (PLANT ID): AUXILIARY BUILDING STEAM LINE RUPTURE DETECTION

(TS-12-93A, -93B)

LICENSEE SUBMITTAL: SCEW(S): EEB-1022 (TABLES 3.11-6/2 AND 3.11-8/16)

EQUIPMENT ITEM NO. 154

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

FENWAL MODEL 18003-7

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 154

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING INTAKE TEMPERATURE (TS-30-103)

LICENSEE SUBMITTAL: SCEW(S): EEB-1017 (TABLE 3.11-6/2)

FUNCTION (PLANT ID): AUXILIARY FW PUMP ROOM TEMPERATURE (TS-30-214)

LICENSEE SUBMITTAL: SCEW(S): EEB-1017 (TABLES 3.11-6/17 AND 3.11-8/14)

EQUIPMENT ITEM NO. 155

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING FW PUMP TURBINE ROOM, EL. 669'

FENWAL MODEL 17323-0

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 155

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): HIGH TEMP LINE BREAK DETECTION (TS-1-17A, -17B, -18A,

-18B)

SERVICE: STEAM FLOW TO AFPT ISOLATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1011 (TABLES 3.11-6/17 AND 3.11-8/1)

EQUIPMENT ITEM NO. 156

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING INDIVIDUAL COOLER ROOMS, EL. 714'0"

FENWAL MODEL T675A1540

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 156

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): PIPE BREAK DETECTION (TS-74-43, -44, -45, -46)

SERVICE: RHR RETURN LINE

LICENSEE SUBMITTAL: SCEW(S): EEB-1013 (TABLES 3.11-7/20 AND 3.11-8/8)

TEMPERATURE ELEMENTS LOCATED IN THE CONTAINMENT

ROSEMOUNT MODEL 176KS

REQUIRED OPERATING TIME: 100 DAYS

TER CHECKSHEET NO. 157

LICENSEE REFERENCE(S): 687

FUNCTION (PLANT ID): WIDE RANGE TEMPERATURE (TE-68-1, -18, -24, -41, -43,

-60, -65, -83

LICENSEE SUBMITTAL: SCEW(S): NEB-68-12 (TABLE 3,11-4/13

EQUIPMENT ITEM NO. 158

HYDROGEN ANALYZER LOCATED IN THE ANNULUS

COMSIP MODEL K-111M

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 158

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): HYDROGEN MONITOR (NOT STATEL)

LICENSEE SUBMITTAL: SCEW(S): EEB-1026 (TABLE 3.11-5/2)

EQUIPMENT ITEM NO. 159

PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING PIPE GALLERY, EL. 690'0"

FOXBORO MODEL E11GM

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 159

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): MAIN STEAM HEADER PRESSURE (PT-1-2A, -27A, -5, -30)

SERVICE: STEAM GENERATOR 1 AND 4

LICENSEE SUBMITTAL: SCEW(S): NEB-1-31 (TABLES 3.11-8/27 AND 3.11-7/17)

EQUIPMENT TEM NO. 160

LEVEL TRANSMITTER LOCATED IN THE CONTAINMENT

FOXBORO MODEL E-13DM (MCA)

REQUIRED CPERATING TIME: 1 HOUR

TER CHECKSHEET NO. 160

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): NARROW RANGE STEAM GENERATOR LEVEL (LT-3-148, -156,

-164, -171, -172, -174, -175, -173)

LICENSEE SUBMITTAL: SCEW(S): EEB-1002 (TABLE 3.11-4/7)

TEMPERATURE ELEMENT LOCATED IN THE CONTAINMENT

ROSEMOUNT MODEL 176KF

REQUIRED OPERATING TIME: 30 SECONDS

TER CHECKSHEET NO. 161

LICENSEE REFERENCE(S): 687

FUNCTION (PLANT ID): NARROW RANGE TEMPERATURE (TE-68-2A, -2B, -14, -25, -37,

-44, -56, -67, -79)

LICENSEE SUBMITTAL: SCEW(S): NEB-68-15 (TABLE 3.11-4/13)

EQUIPMENT ITEM NO. 162

SOLENOID VALUE LOCATED IN THE ANNULUS

VALCOR MODEL V70900-301

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 162

LICENSEE REFERENCE(S): 4760

FUNCTION (PLANT ID): CONTAINMENT VACUUM RELIEF ISOLATION VALVE (FSV-30-46A,

-47A, -48A)

LICENSEE SUBMITTAL: SCEW(S): EEB-1042

EQUIPMENT ITEM NO. 163

POWER SUPPLY LOCATED IN THE AUXILIARY BUILDING

WESTINGHOUSE, MODEL NOT STATED

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 163

LICENSEE REFERENCE(S): 1572, 1573, 1574, 1575, 1576, 1577, 1578

FUNCTION (PLANT ID): HYDROGEN RECOMBINER POWER SUPPLY (NOT STATED)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-36 (TABLE 3.11-6/20)

EQUIPMENT ITEM NO. 164

PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING PIPE GALLERY, EL. 690'

FOXBORO MODEL Eligm (MCA)

REQUIRED OPERATING TIME: 10 MINUTES

TER CHECKSHEET NO. 164

LICENSEE REFERENCE(S): 919

FUNCTION (PLANT ID): STEAM HEADER PRESSURE (PT-1-2B, -27B)

SERVICE: STEAM GENERATOR 1 AND 4

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-33 (TABLES 3.11-8/3 AND 3.11-7-17)

EQUIPMENT ITEM NO. 165

PRESSURE TRANSMITTER LOCATED IN THE EAST VALVE ROOM

FOXBORO MODEL E11GM (MCA)

REQUIRED OPERATING TIME: 10 MINUTES

TER CHECKSHEET NO. 165

LICENSEE REFERENCE(S): 919

FUNCTION (PLANT ID): MAIN STEAM HEADER PRESSURE (PT-1-9A, -9B, -20A, -20B,

-12, -23)

SERVICE: STEAM GENERATOR 1 AND 4

LICENSEE SUBMITTAL: SCEW(S): NEB-1-32 (TABLES 3.11-8/4 AND 3.11-6/19)

EQUIPMENT ITEM NO. 166

PRESSURE CONTROLLER LOCATED IN THE AUXILIARY BUILDING

JOHNSON CONTROLS MODEL PC-4000-2

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 166

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GAS TREATMENT FAN FLOW CONTROL

(FC-30-148, -149)

LICENSEE SUBMITTAL: SCEW(S): EEB-1047 (TABLES 3.11-6/18 AND 3.11-8/24)

EQUIPMENT ITEM NO. 167

LEVEL TRANSMITTER LOCATED IN THE CONTAINMENT LOWER COMPARTMENT

BARTON MODEL 764 (LOT 2)

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 167

LICENSEE REFERENCE(S): 1570

FUNCTION (PLANT ID): STEAM GENERATOR WIDE RANGE LEVEL (LT-3-43, -49)

LICENSEE SUBMITTAL: SCEW(S): NEB-3-7 (TABLE 3.11-4/15)

FUNCTION (PLANT ID): STEAM GENERATOR WIDE RANGE LEVEL (LT-3-56, -111)

LICENSEE SUBMITTAL: SCEW(S): NEB-3-6 (TABLE 3.11-4/15)

EQUIPMENT ITEM NO. 168

PRESSURE TRANSMITTERS LOCATED IN THE CONTAINMENT

BARTON MODEL 763 (LOT 2)

REQUIRED OPERATING TIME: 5 MINUTES

TER CHECKSHEET NO. 168

LICENSEE REFERENCE(S): 1570

FUNCTION (PLANT ID): PRESSURIZER PRESSURE (PT-68-322, -323, -334, -340)

LICENSEE SUBMITTAL: SCEW(S): NEB-68-11 (TABLE 3.11-4/14)

EQUIPMENT ITEM NO. 169

LEVEL TRANSMITTER LOCATED IN THE CONTAINMENT

BARTON MODEL 764 (LOT 2)

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 169

LICENSEE REFERENCE(S): 1570

FUNCTION (PLANT ID): STEAM GENERATOR LEVEL (2-LT-3-38, -39, -42, -51, -52,

-97, -106, -107)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-52 (TABLE 3.11-4-2/2)

FUNCTION (PLANT ID): CONTAINMENT LEVEL (2-LT-63-176, -177, -178, -179)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-52 (TABLE 3.11-4-2/2)

FUNCTION (PLANT ID): PRESSURIZER LEVEL (2-PT-68-320, -335, -339)

LICENSEE SUBMITTAL: SCEW(S): NEB-XX-52 (TABLE 3.11-4A-2/1)

EQUIPMENT ITEM NO. 170

CONTROL SWITCH LOCATED IN THE AUXILIARY BUILDING

CUTLER-HAMMER MODEL 10250T

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 170

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): LOCAL CONTROL (VARIOUS)

SERVICE: LOCAL CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-HS-2-2 (3.11-8-2 PAGES 6, 7, 8, AND 9)

EQUIPMENT ITEM NO. 171

CONTROL SWITCH LOCATED IN THE AUXILIARY BUILDING

CUTLER-HAMMER MODEL 10250T

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 171

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): LOCAL CONTROL (VARIOUS)

SERVICE: LOCAL CONTROL

LICENSEE SUBMITTAL: SCEW(S): EEB-HS-2-2 (3.11-8-2 PAGES 4, 5, AND 9)

EQUIPMENT ITEM NO. 172

FLOW SWITCH LOCATED IN THE AUXILIARY BUILDING

DWYER MODEL 1627

REQUIRED OPERATING TIME: 1 YEAR

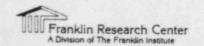
TER CHECKSHEET NO. 172

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): FAN INTERLOCK (FS-30-157, -184, -185, -200, -207)

SERVICE: FAN FLOW

LICENSEE SUBMITTAL: SCEW(S): EEB-1049-2 (3.11-6-2/1 AND 3.11-8-2/1)



EQUIPMENT ITEM NO. 173

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

HONEYWELL MODEL T675A 1540

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 173

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GENERAL SUPPLY FANS (TS-30-140A)

SERVICE: FAN 2A AND 2B INTAKE TEMPERATURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1050-2 (3.11-6-2 PAGE 2)

EQUIPMENT ITEM NO. 174

TEMPERATURE SWITCH LOCATED IN THE AUXILIARY BUILDING

FENWAL MODEL 18003-7

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 174

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): AUXILIARY BUILDING GENERAL SUPPLY FANS (TS-30-140)

SERVICE: FAN 2A AND 2B INTAKE TEMPERATURE

LICENSEE SUBMITTAL: SCEW(S): EEB-1046-2 (3.11-6-2 PAGE 2)

EQUIPMENT ITEM NO. 175

ELECTRICAL CABLE LOCATED IN THE CONTAINMENT

EATON CORP, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 175

LICENSEE REFERENCE(S): 1802, 4421

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-4-2

EQUIPMENT ITEM NO. 176

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

SAMUEL MOORE, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 176

LICENSEE REFERENCE(S): 1802, 4421

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-5-2

EQUIPMENT ITEM NO. 177

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT

SAMUEL MOORE, MODEL NOT STATED

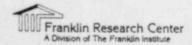
REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 177

LICENSEE REFERENCE(S): 1802, 4421

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA)

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-6-2



EQUIPMENT ITEM NO. 178

ELECTRICAL CABLE LOCATED INSIDE AND OUTSIDE CONTAINMENT ANACONDA, MODEL NOT STATED

REQUIRED OPERATING TIME: NOT STATED

TER CHECKSHEET NO. 178

LICENSEE REFERENCE(S): 6449

FUNCTION (PLANT ID): ELECTRICAL DISTRIBUTION (WVA (FREP))

LICENSEE SUBMITTAL: SCEW(S): EEB-CBL-7-2

EQUIPMENT ITEM NO. 179
LIMIT SWITCH LOCATED IN THE ANNULUS
NAMCO MODEL EA170
REQUIRED OPERATING TIME: 1 YEAR
TER CHECKSHEET NO. 179
LICENSEE REFERENCE(S): 1530, 4752
FUNCTION (PLANT ID): POSITION INDICATION (

FUNCTION (PLANT ID): POSITION INDICATION (2-ZS-30-46, -47, -48; FCV-81-12) LICENSEE SUBMITTAL: SCEW(S): EEB-1058 (3.11-5 PAGE 6, 3.11-8-2 PAGE 3)

EQUIPMENT ITEM NO. 180

LIMIT SWITCH LOCATED IN VARIOUS LOCATIONS

NAMCO MODEL EA-170

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 180

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POSITION INDICATION (2-FCV-63-72, -73; 2-FCV-81-12; 2-PCV-68-334, -340A)

LICENSEE SUBMITTAL: SCRW(S): NEB-XX-44

EQUIPMENT ITEM NO. 181

LIMIT SWITCH LOCATED IN ANNULUS

NAMCO MODEL EA700

REQUIRED OPERATING TIME: 1 YEAR

TER CHECKSHEET NO. 181

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POSITION INDICATION (FCV-32-81, -103, -111)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1053-2 (3.11-5-2 PAGE 1)

EQUIPMENT ITEM NO. 182

LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING

NAMCO MODEL EA700

REQUIRED OPERATING TIME: 1 YEAR

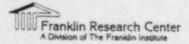
TER CHECKSHEET NO. 182

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): POSITION INDICATION (ZS-67-217, -219, -336, -338)

SERVICE: POSITION INDICATION

LICENSEE SUBMITTAL: SCEW(S): EEB-1059-2 (3.11-7-2 PAGES 1, 2; 3.11-8-2 PAGE 1)



EQUIPMENT ITEM NO. 183
SOLENOID VALVE LOCATED IN THE CONTAINMENT

ASCO MODEL 206-381

REQUIRED OPERATING TIME: 30 DAYS

TER CHECKSHEET NO. 183

LICENSEE REFERENCE(S): NOT CITED

FUNCTION (PLANT ID): CONTAINMENT HYDROGEN MONITORING (2-FSV-43-207, -208)

LICENSEE SUBMITTAL: SCEW(S): EEB-1020

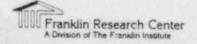
APPENDIX C - PLANT SAFETY-RELATED SYSTEMS AND DISPLAY INSTRUMENTATION

C.1 LIST OF SAFETY-RELATED SYSTEMS

In accordance with IE Bulletin 79-01B or NUREG-0588, the Licensee was required to (1) establish a list of systems and equipment required to mitigate the consequences of a loss-of-coolant accident (LOCA) and a high energy line break (HELB) and (2) identify components needed to perform the functions of safety-related display information, post-accident sampling and monitoring, and radiation monitoring.

The list of safety-related systems provided by the Licensee was reviewed by the NRC staff against a staff-developed master list. The NRC staff had developed a generic master list based upon a review of plant safety analyses and emergency procedures. The systems list was established on the basis of the functions that must be performed for accident mitigation (without regard to location of equipment relative to hostile environments). The instrumentation selected included that needed to monitor overall plant performance as well as to monitor the performance of systems on the list.

Based upon information in the Licensee's submittal, the equipment location references, and in some cases conversations with the Licensee, the NRC staff verified that the systems included in the Licensee's submittal were those required to achieve or support: (1) emergency reactor shutdown, (2) containment isolation, (3) reactor core cooling, (4) containment heat removal, (5) core residual heat removal, and (6) prevention of significant release of radioactive material to the surrounding environment. With the exception of items deferred for later review (cold-shutdown equipment and TMI Lessons-Learned modifications), the staff concluded that the systems identified by the Licensee were acceptable. The list of systems identified by the Licensee and accepted by the NRC staff is as follows:



Function

Emergency Reactor Shutdown

Containment Isolation

Reactor Core Cooling

Containment Heat Removal

System1

Reactor Protection System

Chemical and Volume Control System

Reactor Coolant System

Containment Isolation

Main Steam

Main Feedwater

Auxiliary Feedwater

Chemical and Volume Control

Safety Injection

Residual Heat Removal

Containment Spray

Component Cooling

Safety Injection

Upper Head Injection

Residual Heat Removai

Ice Condenser

Containment Spray

Primary Containment Cooling

Residual Heat Removal

^{1.} The NRC staff recognized that there are differences in nomenclature of systems because of plant vintage and engineering design; consequently, some systems performing identical or similar functions may have different names. In those instances it was necessary to verify the system(s) function with the responsible IE regional reviewer and/or the licensee.

Function

Core Residual Heat Removal

Prevention of Significant Release of Radioactive Material to Environment

Supporting Systems

System

Residual Heat Removal

Main Feedwater

Auxiliary Feedwater

Component Cooling

Essential Raw Water Cooling

Steam Dump

Emergency Gas Treatment

Hydrogen Recombiners

Radiation Monitoring

Neutron Monitoring

Ice Condenser

Fuel Oil, Diesel Starting Air, Standby Diesel Generator System

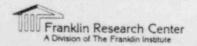
Diesel Generator Backed AC Power, Vital 125V DC Power, Emergency Lighting

Ventilation, Air Conditioning, Central Air

High Pressure Fire Protection CO₂ Storage, Fire Protection, Furging

Spent Fuel Pit Cooling

Flood Mode Boration



C.2 SAFETY-RELATED INSTRUMENTATION

In Section 3.1 of the NRC SER [11], 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 menitoring equipment is closely related to the review of the TMI Lessons-Learned modifications and will be performed in conjunction with that review."

In Reference 12, the Licensee provided the following response:

"Display Instrumentation Lists, according to the quidelines of this section of the SER, are given in Tables A and B [Tables C-1 and C-2, respectively, of this TER]. Table A lists the plant parameters and associated instrument numbers required for accident monitoring as delineated by the plant technical specifications. Table B lists any additional display instruments specifically mentioned in the LOCA and HELB emergency operating procedures. Also included is the number of the Equipment Qualification Sheet (EQS) associated with each device."

Evaluation

The Licensee has satisfactorily responded to the NRC's concern in the SER. This item is considered resolved.

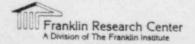


Table C-1. Licensee Table A [12]

DISPLAY INSTRUMENTATION

Table A

	Service and Device	EOS Number
1.	Reactor Coolant T Hot TE-68-1 TE-68-24	NEB-68-12
2.	Reactor Coolant T Cold TE-68-60 TE-68-83	NEB-68-12
3.	Containment Pressure PDT-30-44 PDT-30-45	NED-30-26
4.	RWST Level LT-63-50 LT-63-51	See Note 1
5.	Reactor Coolant Pressure PT-68-66 PT-68-68 PT-68-69 (unit 2 only; unit 1 later)	NEB-68-9
6.	Pressurizer Level LT-68-320 LT-68-335	NEE-68-10

BY THE LICENSEE

Table C-1 (Cont.)

	Service and Device	POG 15-1-
		EOS Number
7.	Steam Line Pressure	
	PT-1-2A	NEB-1-31
	PT-1-2B	NEB-1-33
	PT-1-9A	NEB-1-32
	PT-1-9B	
	PT-1-20A	
	PT-1-20B	
	PT-1-27A	NEB-1-31
	PT-1-27B	NEB-1-33
8.	Steam Generator Level - Wide Range	
	LT-3-43	NEB-3-7
	LT-3-56	NEB-3-6
	LT-3-98	NEB-3-7
	LT-3-111	NEB-3-6
		NED-3-0
9.	Steam Generator Level - Narrow Range	
	LT-3-39	NEB-3-4
	LT-3-52	•
	LT-3-94	
	LT-3-107	
10.	Auxiliary Feedwater Flow Rate	
	PT-3-147	See Note 2
	FT-3-155	See Note 2
	FT-3-163	
	PT-3-170	
11.	Reactor Coolant System Subcooling Margin	
	Monitor (Computer Program)	
	PT-68-68	See Note 2
	PT-68-322, -323, -334, 340	NEB-68-11
	TE-68-1, -24, -43, -65	NEB-68-12
	Incore thermocouples (TE-1E through -65E)	See Note 2
12.	Pressurizer PORV Position indicator	
	Status lights on ES-68-334A and -340AA	See Note 1
	TE-68-33T	See Note 2
	XE-68-334 and -340A	See Note 2
13.	Pressurizer PORV Block Valve Position Indicator	
	Status lights on HS-68-332A and -333A	Con Note 1
	TE-68-331	See Note 1
	XE-68-334 and -340A	See Note 2
	AL 00 334 drd -3408	

FIGURE SUPPLIED BY THE LICENSEE

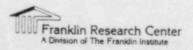


Table C-1 (Cont.)

	Service and Device	POS	Numb	er
14.	Safety Valve Position Indicator TE-68-328, -329, -330 TE-68-309 (Pressurizer relief tank temperature PT-68-301 (Pressurizer rilief tank pressure) LT-68-300 (Pressurizer relief tank level) XE-68-363, -364, -365		Note	2
15.	Contairment Water Level LT-63-176 LT-63-177 LT-63-178 LT-63-179	See	Note	2
16.	Incore Thermocouples TE-1E through -65E	See	Note	2

NOTE:

- 1. Pevice is located in a mild environment area.
- Evaluation is not complete at this time. EQS will be submitted with the next revision of the EEEQR.

FIGURE SUPPLIED BY THE LICENSEE

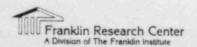


Table C-2. Licensee Table B [12]

DISPLAY INSTRUMENTATION

Table B

	Service and Device	EOS Number
1.	Condensate Storage Tank Level LT-2-230 LT-2-233	See Note 1
2.	Containment Spray Pump Flow FT-72-13 FT-72-34	EEB-1034
3.	Residual Heat Removal Pump Flow FT-63-91A FT-63-92A FT-63-173	See Note 2
4.	Safety Injection Pump Flow FT-63-20 FT-63-151	
5.	Centrifugal Charging Pump Flow FT-63-170	
		FIGURE SUPPLIED BY THE LICENSEE

BY THE LICENSEE

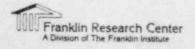


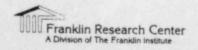
Table C-2 (Cont.)

	Service and Device	EOS	Numbe	er.
6.	Pressurizer Surge Line Temperature TE-68-318 TE-68-319 TE-68-324	See .	Note	2
7.	Containment Temperature TE-30-210A through -210P (Computer inputs) TE-30-210Q through -210Z (Morgan Temperature monitoring) TE-30-210AA through -210AH (Morgan Temperature monitoring)			
8.	Condenser Vacuum Pump Exhaust Radiation RE-90-99 RE-90-119	See	Note	1
9.	Steam Generator Blowdown Radiation RE-90-120 RE-90-121 RE-90-124		Note Note	
10.	Containment Radiation RE-90-2 RE-90-100A, -100B, -100C RE-90-06A, -106B, -106C RE-90-112A, -112B, -112C RE-90-260	See	Note	2

NOTES:

- 1. Device is located in a mild environment area.
- Evaluation is not complete at this time. BQS will be submitted with the next revision of the EEEQR.

FIGURE SUPPLIED BY THE LICENSEE



APPENDIX D - REVIEW OF LICENSEE'S RESPONSE TO NRC EEQ SER CONCERNING JUSTIFICATION FOR INTERIM OPERATION

1. BACKGROUND

The NRC Safety Evaluation Report (SER) concerning equipment environmental qualification (EEQ) states [10]:

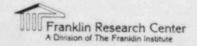
"Subsection 4.2 identified deficiencies that must be resolved to establish the qualification of the equipment; the staff requires that the information lacking in this category be provided within 90 days of receipt of this SER. Within this period, the licensee should either provide documentation of the missing qualification information which demonstrates that such equipment meets the DOR guidelines or NUREG-0588 or commit to a corrective action (requalification, replacement, relocation, and so forth) consistent with the requirements to establish qualification by June 30, 1982. If the latter option is chosen, the licensee must provide justification for operation until such corrective action is complete."

On January 19, 1982, FRC representatives met with NRC Division of Licensing personnel at NRC offices to discuss the potential for FRC to assist the staff in the technical review of licensees' statements regarding justification for interim plant operation submitted in response to outstanding qualification deficiencies in the NRC FEQ 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.



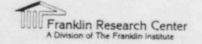
o On January 27, 1982, FRC shall provide a list of those power reactors that have provided technically sound justification for continued operation. FRC shall also provide a list of those power reactors which have not provided technically sound justification for continued operation. In addition to the 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, license-e-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

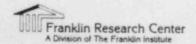
^{**} C. J. Crane
Letter to R. A. Clark, NRC. Subject: Transmittal of Actual Examples of
Licensees' Responses to NRC EEQ SER Which Provide Adequate Rationale as a
Basis for Justification of Interim Operation
FRC, 5-Feb-82

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.



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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:

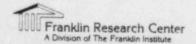
"EQUIPMENT ENVIRONMENTAL QUALIFICATION (EEQ)
Review of Licensees' Resolution of Outstanding Issues
From NRC Equipment Environmental Qualification
Safety Evaluation Reports

SUMMARY OF REVIEW
OF LICENSEE 90-DAY RESPONSE

Utility: Tennessee Valley Authority Plant Name: Sequoyah Unit 2 NRC Docket No. 50-328 NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. 526

References:

- a. L. M. Mills
 Letter to E. Adensam (NRC)
 Subject: Sequoyah Nuclear Plant
 Response to NRC Safety Evaluation for the Environmental
 Qualification of Safety-Related Electrical Equipment
 Tennessee Valley Authority, 25-Sep-81
- b. Office of Nuclear Reactor Regulation Safety Evaluation Report for Sequoyah Units 1 and 2 Environmental Qualification of Safety-Related Electrical Equipment NRC, 1981



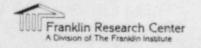
The Licensee has submitted technical information in Reference a in response to the NRC SER [b] on environmental qualification. FRC has reviewed these documents [a, b]. As a result of this review, FRC concludes that the Licensee has stated that the equipment items are environmentally qualified; or has provided a technically sound rationale as a basis for justification for continued plant operation; or has provided a technically sound rationale or other additional information which in FRC's judgment provides a basis for justification for continued operation; with the following exceptions:

Equipment Equipment Description/ SCEW Sheet

Item Function No. Status Code Deficiency

None

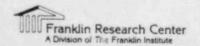
The Licensee's response to the SER addressed and provided resolution of deficiencies identified in the SER and provided adequate rationale as a basis for justification for interim operation."



APPENDIX E - REQUEST FOR ADDITIONAL INFORMATION

This appendix contains the Request for Additional Information (RAI) that was developed during the course of the review and issued to the NRC for forwarding to the Licensee. The RAI was revised throughout the review to reflect the Licensee's response(s) to the initial RAI.

The reader is cautioned that the numbers in brackets refer to citations found in the list of references at the end of this appendix and not to the citations listed in Section 6, References, of the TER.



TER-C5257-526 RAI Rev. 3, August 10, 1982

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

Tennessee Valley Authority Sequoyah Unit 2

NRC Docket No. 50-328

NRC TAC No. 42535

December 21, 1981 Rev. 1, February 23, 1982 Rev. 2, May 20, 1982 Rev. 3, August 10, 1982

BACKGROUND

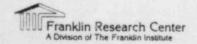
Franklin Research Center (FRC) of Philadelphia, Pa. is providing assistance to the U.S. Nuclear Regulatory Commission (NRC) for the equipment environmental qualification (EEQ) review of operating reactors. FRC will perform an EEQ review of the Licensee's 90-day response to outstanding issues from the 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 (FAI) is the result of an evaluation of the information provided by letters dated November 1981 [1] and September 25, 1981 [2].* FRC previously requested TMI Action Plan information by a telephone memorandum dated October 7, 1981.

On February 19, 1982, FRC received from the Tennessee Valley Authority (TVA) a partial revision to Reference 1 dated January 19, 1982 [6]. This revision includes: (1) changes to the Licensee's electrical equipment qualification status code for some equipment items and (2) additional pages to the Licensee's table ii, "Summary of Electrical Equipment Qualification Status." (1)**

By letters dated March 15, 1982 [7] and April 7, 1982 [8], the Licensee updated the list of post-accident monitoring instruments and forwarded qualification documents as noted below. (2)

On July 16, 1982 [9] TVA transmitted NAMCO Controls Test Report QTR-107 in response to Section A.1.F. (3)



^{*}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.

A. FRC REVIEW OF THE LICENSEE'S 90-DAY RESPONSE TO THE NRC EEQ SER

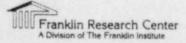
INFORMATION REQUESTED

DATE RECEIVED BY FRC***

1.	In reference to the Licensee's 90-day response [2] to the NRC SER [4], a legible
	single copy of each of the following qualification documents is requested in order
	that the FRC evaluation may proceed:

a.	Westinghouse Test Report NS-TMA-1950	Received 3/4/82 for Task 497/498(2)
b.	Westinghouse Test Report NS-TMA-2120	
c.	Foxboro Test Report T2-1075	4/19/82 [8](2)
d.	Estimation of Service Life of EA-170-XX302 Limit Switches, November 9, 1979	4/19/82 [8](2)
e.	Letter R. M. Kantner (Namco Controls), to L. Stefanek (TVA), "Switches for Use in Nuclear Power Plants," Feb. 23, 1981	4/19/82 [8](2)
f.	Nameo Controls Test Report QTR-107	7/21/82 [9](3)
g.	Test Plan for No. LP10767-2, Rev. 3, for Namco Controls EA-170-XX-302, November 2, 1979	4/19/82 [8](2)
h.	Acme-Cleveland Test Report QTR-105, "Qualification of EA180 Series Limit Switches for Use in Nuclear Power Plants," August 28, 1980	4/19/82 [8](2)
i.	Namco Report, "Estimation of Qualified Life of EA-740 Series Nuclear Switch," Feb. 27, 1980 Rev.	4/19/82 [8](2)
j.	Letter ITT Barton to F. W. Chandler (EEB 801204034)	4/19/82 [8](2)
k.	Valcor Qualification Report No. MR70900-301-1	4/19/82 [8](2)
1.	A & M's Report No. 201-39500	4/19/82 [8](2)

^{***}This column will be completed by FRC as the requested information is received.



		DATE RECEIVED BY FRC***
m.	Rockbestos Report, "Qualification of Firewall SR, Class IE Cables," June 7, 1978	4/19/82 [8](2)
n.	Anaconda Continental Report No. 79117	4/19/82 [8](2)
0.	Wyle Laboratory Test Report 43854-3, April 26, 1978	4/19/82 [8](2)
р.	ESSEX Project Report No. PE-53, May 7, 1980 and Report, June 1979	4/19/82 [8](2)
q.	Isomedix Test Report 375-02 dated March 1975 for ITT Suprenant	4/19/82 [8](2)
r.	Okonite Test Report, "Qualification of OKOZEL Insulated Wire and Cable for Nuclear Plant Service," No. K-0-1, September 1, 1979	4/19/82 [8](2)
s.	Okonite "Engineering Report No. 344, Rev. 1, Main Steam Line Break Qualification Test on OKOZEL Insulation," April 16, 1981	4/19/82 [8](2)
t.	Westinghouse Test Report PEN-RLK-3-26-73	4/19/82 [8](2)
u.	Triax Test Report of Incident Testing of Triax Penetration	4/19/82 [8](2)
v.	Brand-Rex Long Term Thermal Aging - Arrhenius Plot, May 30, 1978	4/19/82 [8](2)
w.	Isomedix Qualification Test for Eaton Corporation, Samuel Moore Operations, January 1980 (MSLB)	Received 4/1/82 for Task 452(2)
х.	Letter - General Electric Company to H. J. Green of TVA dated January 31, 1978, "Test Data for Terminal Blocks, Catalog No. CR-151B"	4/19/82 [8](2)
у.	Letter - Westinghouse Company to F. W. Chandler of TVA dated March 9, 1978, "Data for Terminal Block - Westinghouse Style No. 80530"	4/19/82 [8](2)

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DATE RECEIVED BY FRC***

4/19/82 [8](2)

- z. Report BWR Owner's Group Report 081-A-01 dated September 23, 1980, supplied test data for terminal block, General Electric Company Type No. EB-25
- The normal and accident environment profiles for inside containment (temperature and pressure vs. time and humidity) were missing from References 1 and 2. FRC requests this information.
- B. FRC REVIEW OF INSTALLED TMI ACTION PLAN ITEMS

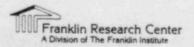
INFORMATION REQUESTED

DATE RECEIVED BY FRC***

- 1. Reference 1 does not provide adequate detail with respect to identification of TMI Action Plan equipment installed as of 1/1/81. (FRC has not received any response to the previous request for information concerning TMI Action Plan items [3].)
 - a. Identification of all TMI Action Plan equipment installed as of 1/1/81 is requested.
 - b. Identification of TMI Action Plan equipment installed with implementation dates after 1/1/81 is requested.
 - c. The correlation of these equipment items with the specific sections of NUREG-0737 [5] presented below (as applicable) is requested.

IIE1.2, IIE4.2, IIE3.1, IIG1, IIF2,
IID3, IIK3.12(Wx), IIK3.9(Wx), IIB3,
IIE4.1.

[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?]



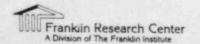
TER-C5257-526 RAI Rev. 3, August 10, 1982

DATE RECEIVED BY FRC***

- d. For all installed TMI Action Plan equipment identified, a System Component Evaluation Worksheet (SCEW) (in accordance with 79-01B format) is requested.
- e. The approximate installation date for the TMI Action Plan equipment items is requested so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation.
- 2. The qualification documents, e.g., the actual test reports and associated correspondence cited as evidence of qualification listed on the SCEW sheets, for all identified TMI Action Plan equipment are requested. [The identification of those reports considered to be proprietary is requested so that proper control of documents can be maintained.]
- 3. Where the Licensee has a standard Owners' Group position with respect to a NUREG-0737 technical area or has requested extensions of implementation dates, this information is requested in order to incorporate it into the review.
- C. INSTRUCTIONS FOR TRANSMITTING INFORMATION REQUESTED
- 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

- Electrical Equipment Environmental Qualification Report for Sequoyah Nuclear Plant - Unit 1 Tennessee Valley Authority, 00-Nov-80 Proprietary
- 2. L. M. Mills Letter to E. Adensam (NRC) Subject: Sequoyah Nuclear Plant Response to NRC Safety Evaluation for the Environmental Qualification of Safety-Related Electrical Equipment Tennessee Valley Authority, 25-Sep-81
- 3. Telephone Memorandum
 C. J. Crane, R. Garrison, and D. Schmitz (FRC). Conversation with
 H. Walker (NRR/EQB), R. Reeves, J. Willis, R. Rogers, J. Edwards,
 and S. Stout (TVA)
 Subject: Request for Information, EEQ Review of TMI Action Plan
 Items, Sequoyah Units 1 and 2 and Browns Ferry Units 1, 2 and 3
 07-Oct-81
- 4. Office of Nuclear Reactor Regulation Safety Evaluation Report for Sequoyah Units 1 and 2 Environmental Qualification of Safety-Related Electrical Equipment NRC, 1981
- 5. NUREG-0737 "Clarification of TMI Action Plan Requirements" NRC, November 1980
- 6. L. M. Mills

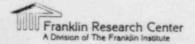
 Letter to E. Adensam, NRC. Subject: Sequoyah

 Nuclear Plant; Revised Pages to September 25, 1981

 Submittal on Environmental Qualification of

 Electrical Equipment

 Tennessee Valley Authority, 19-Jan-82(1)
- 7. L. M. Mills
 Letter to E. Adensam, NRC. Subject: Post-Accident Monitoring (PAM)
 Instrumentation
 Tennessee Valley Authority, 07-Apr-82(2)



TER-C5257-526 RAI Rev. 3, August 10, 1982

- 8. M. R. Wisenberg
 Letter to E. Adensam, NRC. Subject: Response to Request for
 Additional Information on Equipment Environmental Qualification
 Tennessee Valley Authority, 07-Apr-82(2)
- 9. L. M. Mills
 Letter to C. J. Crane, FRC. Subject: Transmittal of Requested Test
 Report, Sequoyah 1 and 2
 Tennessee Valley Authority, 16-Jul-82 (3)