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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)

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNIT 2

VOL. 1 OF 2

NRC DOCKET NO. 50-281

NRC TAC NO. 42469

NRC CONTRACT NO. NRC-03-79-118

FRC PROJECT C5257

FRC ASSIGNMENT 13

FRC TASK 483

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

December 22, 1982

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Franklin Research Center
A Division of The Franklin Institute
The Benjamin Franklin Parkway, Phila., Pa. 19103 (215) 448-1000

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Reviewed by: _____
Group Leader

Approved by: _____
Project Manager

_____
Department Director

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FOREWORD

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

IDENTIFICATION OF PROPRIETARY INFORMATION

Some of the information in this technical evaluation report was obtained from manufacturers' proprietary test reports. All proprietary test reports are identified as such in Section 6, References, of this report. Checksheets in Section 4 containing proprietary information 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) [9],* 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 [13] applicable to equipment having an installation implementation date of January 1, 1981. Where applicable, a review is to be performed on installed equipment with implementation dates after January 1, 1981 if adequately identified by the Licensee.

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

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

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

1.3 GENERIC ISSUE BACKGROUND

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

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

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

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

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

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

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

Qualification requirements are also embodied in (1) 10CFR50 Appendix A, General Design Criteria 1, 2, and 23 and (2) 10CFR50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessin 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" [5]. (The document is hereafter

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

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

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

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

On February 21, 1980, the NRC and representatives of the SEP Plant Owners Group held an open meeting at NRC headquarters to discuss an accelerated review program in accordance with the DOR Guidelines. Representatives of the Indian Point Units and Zion Station also attended this meeting. The NRC formally issued to all licensees represented at the meeting the DOR Guidelines document which included a second document, "Guidelines for Identification of That Safety Equipment of SEP Operating Reactors for Which Environmental Qualification Is To Be Addressed" [5], 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 [10], specifying that licensees and applicants must meet the requirements set forth in the DOR Guidelines and NUREG-0588 regarding environmental qualification of safety-related electrical equipment in order to satisfy 10CFR50, Appendix A, General Design Criteria, Section I, Criterion 4. This Order also established that the SERs on this subject, to be prepared by the NRC staff, must be issued on February 1, 1981 and that all subsequent actions to be taken by licensees to achieve full compliance with the DOR Guidelines or NUREG-0588 must be completed no later than June 30, 1982. The Memorandum and Order established the DOR Guidelines and NUREG-0588 as acceptable interpretations of the General

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

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

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

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

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

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

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

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

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

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

On April 20, 1982, the NRC staff issued Generic Letter No. 82-09 [11] to all licensees, presenting the NRC's position and clarification of certain aspects of the environmental qualification requirements.

1.4 SPECIFIC ISSUE BACKGROUND

On May 31, 1978, the NRC Office of Inspection and Enforcement issued IE Circular 78-08, "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 documen ation 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, nighlighting the staff positions affecting the licensees' responses, were issued on September 29 and October 24, 1980, respectively.

The NRC SER [17] stated the following:

> "The NRC Office of Inspection and Enforcement performed (1) a preliminary evaluation of the licensee's response, documented in technical evaluation reports (TERs) and (2) onsite verification inspections (reports dated May 2, 1980) of selected safety-related electrical equipment. Some components of the inside recirculation spray and the feedwater systems were inspected at both Units 1 and 2. The inspections at both units verified proper installation of equipment, overall interface integrity, and manufacturers' nameplate data. The manufacturer's name and model number from the nameplate data were compared to information given in the Component Evaluation Work Sheets (CES) of the licensee's report. The site inspections are documented for Units 1 and 2 in reports IE 50-280/80-14 and 281/80-15, respectively. Prior to the inspection, the licensee had not determined the model numbers of several components listed on the CES. Consequently, licensee and inspector model numbers could not be compared. The licensee agreed to provide the model numbers during the present outage of the Surry steam generator."

On October 1, 1980 [1], Virginia Electric and Power Company (VEPCO) provided the NRC with an equipment environmental qualification submittal in response to IE Bulletin 79-01B for Surry Power Station Unit 2.

On December . 1980 [2], VEPCO submitted to the NRC further equipment environmental qualification information [3, 4] in response to IE Bulletin 79-01B.

On January 30, 1981 [14], VEPCO submitted to the NRC Revision 3 to the previous response to IE Bulletin 79-01B.

The NRC issued a Safety Evaluation Report (SER) to VEPCO on May 21, 1981 [17].

By letter dated August 24, 1981 [18], VEPCO transmitted to the NRC a response to the SER.

Requests for information [102, 103, 104] 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 [13].

In References 23, 26, and 27, VEPCO responded 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:

- DOR Guidelines, "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," November 1979 [5]
- NUREG-0588, Revision 1, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," July 1981 [12].

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

- IE Bulletin 79-01B, "Environmental Qualification of Class 1E Equipment," January 14, 1980; Supplement No. 1, February 29, 1980; Supplement No. 2, September 29, 1980; and Supplement No. 3, October 24, 1980 [6, 7, 8, 9]
- NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980 [13]. 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 [8] describe the application of the DOR Guidelines and NUREG-0588 to operating reactors (ORs),

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

[Question 3]

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

[NRC Answer to Question 3]

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

TABLE 1

REQUIREMENTS

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

REPLACEMENT COMPONENTS
USE NUREG-0588 (CAT. I)

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

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

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

[Question 17]

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

[NRC Answer to Question 17]

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

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

The NRC requested an evaluation of the environmental qualification of safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation in accordance with criteria established by the NRC in a manner identical to the evaluation of all other safety-related electrical equipment. Additionally, Item 21 of Supplement 2 to IE Bulletin 79-01B [8] 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 [9] 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 [8] 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 [9] permits deferment of the review of environmental qualification for all equipment required to achieve and maintain the plant in a cold shutdown condition. Supplements 2 and 3 of 79-01B originally permitted deferment until after February 1, 1981 of the qualification review of equipment located in a mild environment or required to achieve and maintain the plant in a cold shutdown condition. Since the issuance of Supplements 2 and 3, the NRC has determined that the review of environmental qualification for this equipment is not within the scope of the present review program.

2.2.4 Clarification of Qualification Requirements

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

For pressurized water reactors (PWRs), the DOR Guidelines state that the containment temperature and pressure conditions as a function of time should be based on the most recent NRC-approved service conditions specified in the Final Safety Analysis Report (FSAR) or other licensee documentation. In the specific case of pressure-suppression type containments, the following minimum high temperature conditions may be used: (1) boiling water reactor (BWR) drywells -- 340°F for 6 hours and (2) PWR ice condenser lower compartments -- 340°F for 3 hours. As stated in Supplement 2 to IE Bulletin 79-01B [8], "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 [8] 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 [8] 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 [8] 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 [8] 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 [11] presenting staff positions on certain aspects of the qualification requirements. Generic Letter No. 82-09 states:

"1. Operator Display Instrumentation

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

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

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

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

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

2. Safety-Related Equipment

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

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

3. Replacement Parts

Q. Please clarify the NRC requirements on replacement parts.

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

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

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

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

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

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

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

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

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

5. Submergence Outside Containment

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

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

6. Radiation

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

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

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

7. Containment Service Conditions

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

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

8. One Hour Minimum Operating Time

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

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

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

9. Aging

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

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

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

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

3. METHODOLOGY USED FOR THE EVALUATION

3.1 INTRODUCTION

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

The SERs identified various equipment qualification deficiencies as indicated below:

LEGEND: DESIGNATION FOR DEFICIENCY

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

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

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

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

3.2 METHODOLOGY

The Licensee, Virginia Electric and Power Company, provided a response to the SER and additional qualification information in its submittals [18, 21, 23-26] to the NRC for Surry Power Station Unit 2.

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

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

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

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

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

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

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

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

Topics not within the scope of the evaluation are:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The checksheets contain the following information:

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

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

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

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

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. ___

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

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

Figure 3-1. Sample Checksheet Page 1a

"Equipment Item"

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

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

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

3.3 NRC QUALIFICATION CATEGORIES AND DEFINITIONS

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

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

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

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

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. ___

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

Figure 3-2. Sample Checksheet Page 2

"Equipment Environmental Qualification Summary Form"

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

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

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

- NRC Category II.b
  EQUIPMENT THAT IS UNQUALIFIED

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

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

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

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

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

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

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

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

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

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

3.4 IMPLEMENTATION GUIDE FOR FULFILLING NRC CRITERIA

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

4. TECHNICAL EVALUATION

4.1 INTRODUCTION

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

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

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

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

4.2 SUMMARY OF THE EVALUATION

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

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

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

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

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

TABLE 4-1

NUMBER OF EQUIPMENT ITEMS IN EACH QUALIFICATION CATEGORY

NRC CATEGORY	CATEGORY DESCRIPTION	NUMBER OF EQUIPMENT ITEMS
I.A	EQUIPMENT QUALIFIED [EQUIPMENT ITEM NO(S).: 27, 33, 36, 37, 38, 40, 43, 64, 67, 68, 71, 74, 75, 77,109,110,111,114, 115,124,125,126]	22
I.B	EQUIPMENT QUALIFICATION PENDING MODIFICATION [EQUIPMENT ITEM NO(S).: 3, 4, 5, 6, 15, 18, 19, 20, 21, 22, 23, 24, 28, 47, 60, 61, 66, 69, 76, 78, 79, 80, 81, 82, 83, 84, 85, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99,100,102, 104,106,108,112,113,121,122,123,131]	51
II.A	EQUIPMENT QUALIFICATION NOT ESTABLISHED [EQUIPMENT ITEM NO(S).: 1, 7, 8, 9, 10, 12, 13, 17, 26, 30, 34, 35, 39, 41, 44, 46, 50, 51, 62, 63, 72, 73,116,118,119,127,128,129]	28
II.B	EQUIPMENT NOT QUALIFIED [EQUIPMENT ITEM NO(S).: 2, 16]	2
II.C	EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED [EQUIPMENT ITEM NO(S).: 11, 56,101,103,117,120]	6
III.A	EQUIPMENT EXEMPT FROM QUALIFICATION [EQUIPMENT ITEM NO(S).: 14, 25, 31, 32, 42, 52, 53, 54, 55, 57, 58, 59, 65, 70, 87,105,107]	17
III.B	EQUIPMENT NOT IN THE SCOPE OF THE REVIEW [EQUIPMENT ITEM NO(S).: 29, 48, 49]	3
IV	DOCUMENTATION NOT MADE AVAILABLE [EQUIPMENT ITEM NO(S).: 45,130]	2
	TOTAL	131

TABLE 4-2

QUALIFICATION DEFICIENCY SUMMARY

NRC REQUIREMENT	NUMBER OF DEFICIENT EQUIPMENT ITEMS
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	61
[EQUIPMENT ITEM NO(S).: 1, 3, 4, 5, 6, 12, 13, 15, 17, 18, 20, 21, 22, 23, 24, 26, 28, 30, 34, 39, 41, 44, 46, 51, 63, 73, 78, 79, 80, 81, 82, 83, 84, 85, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99,100,102,104,106,108,112,113, 116,118,119,127,128,129,131]	
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED	13
[EQUIPMENT ITEM NO(S).: 7, 8, 9, 10, 30, 34, 39, 41, 44, 46, 50, 62, 73]	
3. AGING DEGRADATION EVALUATED ADEQUATELY	10
[EQUIPMENT ITEM NO(S).: 7, 8, 9, 10, 11, 24, 35, 50, 56, 62]	
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)	13
[EQUIPMENT ITEM NO(S).: 7, 8, 9, 10, 11, 24, 50, 56, 62,101,103,117,120]	
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION	1
[EQUIPMENT ITEM NO(S).: 50]	
6. CRITERIA REGARDING AGING SIMULATION (IF REQUIRED)	1
[EQUIPMENT ITEM NO(S).: 50]	
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:	
A. - PEAK TEMPERATURE ADEQUATE	1
[EQUIPMENT ITEM NO(S).: 72]	
B. - PEAK PRESSURE ADEQUATE	0
C. - DURATION ADEQUATE	5
[EQUIPMENT ITEM NO(S).: 7, 8, 9, 10, 62, 62]	

Table 4-2 (Cont.)

QUALIFICATION DEFICIENCY SUMMARY

NRC REQUIREMENT	NUMBER OF DEFICIENT EQUIPMENT ITEMS
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY---------- [EQUIPMENT ITEM NO(S).: 7, 8, 9, 10]	4
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE----------	0
8. CRITERIA REGARDING SPRAY SATISFIED---------- [EQUIPMENT ITEM NO(S).: 7, 8, 9, 10, 24, 35]	6
9. CRITERIA REGARDING SUBMERGENCE SATISFIED----------	0
10. CRITERIA REGARDING RADIATION SATISFIED---------- [EQUIPMENT ITEM NO(S).: 7, 8, 9, 10, 35, 66, 69, 76]	8
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED----------	0
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED---------- [EQUIPMENT ITEM NO(S).: 2, 16]	2
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED---------- [EQUIPMENT ITEM NO(S).: 24]	1
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED---------- [EQUIPMENT ITEM NO(S).: 24]	1
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED---	0
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)-	0

TABLE 4-3

LICENSEE CORRECTIVE ACTION SUMMARY

CORRECTIVE ACTION DESCRIPTION	NUMBER OF EQUIPMENT ITEMS
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT [EQUIPMENT ITEM NO(S).: 3, 4, 5, 6, 15, 18, 19, 24, 28, 60, 61, 78, 79, 80, 81, 82, 83, 84, 85, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99,100,102,104,106,131]	37
2. EQUIPMENT MODIFICATION [EQUIPMENT ITEM NO(S).: 112,113]	2
3. EQUIPMENT RELOCATION ABOVE SUBMERGENCE LEVEL	0
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE	0
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS	0
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT	0
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS [EQUIPMENT ITEM NO(S).: 121,122,123]	3
8. OTHER (FOR DETAILED DESCRIPTION SEE SPECIFIC EQUIPMENT ITEMS) [EQUIPMENT ITEM NO(S).: 20, 21, 22, 23, 56, 66, 69, 76,108]	9
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED (SEE SPECIFIC EQUIPMENT ITEM FOR COMPLETION DATE) [EQUIPMENT ITEM NO(S).: 3, 4, 5, 6, 15, 18, 19, 28, 66, 69, 76, 78, 79, 80, 81, 82, 83, 84, 85, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99,100,102,104,106,112,113,131]	39

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																			
	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015					
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	X		X	X	X															
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED						X	X					X	X		X					
3. AGING DEGRADATION EVALUATED ADEQUATELY								X	X	X	X									
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)								X	X	X	X	X								
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION								X	X	X	X	X								
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)																				
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:																				
A. - PEAK TEMPERATURE ADEQUATE																				
B. - PEAK PRESSURE ADEQUATE																				
C. - DURATION ADEQUATE																				
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY								X	X	X	X	X								
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE								X	X	X	X	X								
8. CRITERIA REGARDING SPRAY SATISFIED								X	X	X	X									
9. CRITERIA REGARDING SUBMERGENCE SATISFIED																				
10. CRITERIA REGARDING RADIATION SATISFIED								X	X	X	X	X								
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED																				
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED		X																		
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED																				
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED																				
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED																				
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)																				
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																				
I.A EQUIPMENT QUALIFIED																				
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION			X	X	X	X	X								X					
II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED	X							X	X	X	X	X	X	X						
II.B EQUIPMENT NOT QUALIFIED		X																		
II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED												X								
III.A EQUIPMENT EXEMPT FROM QUALIFICATION														X						
III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW																				
IV DOCUMENTATION NOT MADE AVAILABLE																				
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																				
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT			X	X	X	X	X								X					
2. EQUIPMENT MODIFICATION																				
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL																				
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE																				
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS																				
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT																				
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS																				
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)																				
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED			X	X	X	X	X								X					

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

| NRC REQUIREMENTS | (DESIGNATION: X = DEFICIENCY) | FRC EQUIPMENT ITEM NUMBERS | | |

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																			
	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045					
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE				X					X		X			X						
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED				X					X		X			X						
3. AGING DEGRADATION EVALUATED ADEQUATELY					X															
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)																				
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION																				
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)																				
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:																				
A. - PEAK TEMPERATURE ADEQUATE																				
B. - PEAK PRESSURE ADEQUATE																				
C. - DURATION ADEQUATE																				
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY																				
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE																				
8. CRITERIA REGARDING SPRAY SATISFIED					X															
9. CRITERIA REGARDING SUBMERGENCE SATISFIED																				
10. CRITERIA REGARDING RADIATION SATISFIED					X															
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED																				
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED																				
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED																				
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED																				
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED																				
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)																				
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																				
I.A EQUIPMENT QUALIFIED			X			X	X	X		X			X							
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION																				
II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED				X	X				X		X			X						
II.B EQUIPMENT NOT QUALIFIED																				
II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED																				
III.A EQUIPMENT EXEMPT FROM QUALIFICATION	X	X										X								
III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW															X					
IV DOCUMENTATION NOT MADE AVAILABLE																				
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																				
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT																				
2. EQUIPMENT MODIFICATION																				
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL																				
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE																				
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS																				
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT																				
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS																				
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)																				
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED																				

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																							
	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090									
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE			X	X	X	X	X	X	X	X	X		X	X	X									
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED																								
3. AGING DEGRADATION EVALUATED ADEQUATELY																								
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)																								
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION																								
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)																								
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:																								
A. - PEAK TEMPERATURE ADEQUATE																								
B. - PEAK PRESSURE ADEQUATE																								
C. - DURATION ADEQUATE																								
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY																								
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE																								
8. CRITERIA REGARDING SPRAY SATISFIED																								
9. CRITERIA REGARDING SUBMERGENCE SATISFIED																								
10. CRITERIA REGARDING RADIATION SATISFIED	X																							
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED																								
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED																								
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED																								
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED																								
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED																								
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)																								
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																								
I.A EQUIPMENT QUALIFIED		X																						
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION	X		X	X	X	X	X	X	X	X	X		X	X	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												X												
III.A EQUIPMENT EXEMPT FROM QUALIFICATION																								
III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW																								
IV DOCUMENTATION NOT MADE AVAILABLE																								
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																								
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT			X	X	X	X	X	X	X	X	X		X	X	X									
2. EQUIPMENT MODIFICATION																								
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL																								
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE																								
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS																								
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT																								
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS																								
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)	X																							
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED	X		X	X	X	X	X	X	X	X	X		X	X	X									

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																			
	091	092	093	094	095	096	097	098	099	100	101	102	103	104	105					
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	X	X	X	X	X	X	X	X	X	X		X		X						
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED																				
3. AGING DEGRADATION EVALUATED ADEQUATELY																				
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)											X		X							
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION																				
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)																				
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:																				
A. - PEAK TEMPERATURE ADEQUATE																				
B. - PEAK PRESSURE ADEQUATE																				
C. - DURATION ADEQUATE																				
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY																				
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE																				
8. CRITERIA REGARDING SPRAY SATISFIED																				
9. CRITERIA REGARDING SUBMERGENCE SATISFIED																				
10. CRITERIA REGARDING RADIATION SATISFIED																				
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED																				
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED																				
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED																				
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED																				
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED																				
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)																				
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																				
I.A EQUIPMENT QUALIFIED	X	X	X	X	X	X	X	X	X	X		X		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											X		X							
III.A EQUIPMENT EXEMPT FROM QUALIFICATION															X					
III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW																				
IV DOCUMENTATION NOT MADE AVAILABLE																				
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																				
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT	X	X	X	X	X	X	X	X	X	X		X		X						
2. EQUIPMENT MODIFICATION																				
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL																				
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE																				
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS																				
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT																				
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS																				
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)																				
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED	X	X	X	X	X	X	X	X	X	X		X		X						

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EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS																			
	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120					
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE	X		X				X	X			X			X	X					
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED																				
3. AGING DEGRADATION EVALUATED ADEQUATELY																				
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)												X			X					
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION																				
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)																				
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:																				
A. - PEAK TEMPERATURE ADEQUATE																				
B. - PEAK PRESSURE ADEQUATE																				
C. - DURATION ADEQUATE																				
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY																				
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE																				
8. CRITERIA REGARDING SPRAY SATISFIED																				
9. CRITERIA REGARDING SUBMERGENCE SATISFIED																				
10. CRITERIA REGARDING RADIATION SATISFIED																				
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED																				
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED																				
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED																				
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED																				
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED																				
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)																				
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																				
I.A EQUIPMENT QUALIFIED				X		X		X				X		X						
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION	X			X					X		X									
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												X			X					
III.A EQUIPMENT EXEMPT FROM QUALIFICATION		X																		
III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW																				
IV DOCUMENTATION NOT MADE AVAILABLE																				
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																				
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT	X						X	X												
2. EQUIPMENT MODIFICATION																				
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL																				
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE																				
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS																				
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT																				
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS																				
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)			X																	
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED	X						X	X												

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)	FRC EQUIPMENT ITEM NUMBERS												
	121	122	123	124	125	126	127	128	129	130	131		
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE							X	X	X		X		
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED													
3. AGING DEGRADATION EVALUATED ADEQUATELY													
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)													
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION													
6. CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)													
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:													
A. - PEAK TEMPERATURE ADEQUATE													
B. - PEAK PRESSURE ADEQUATE													
C. - DURATION ADEQUATE													
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY													
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE													
8. CRITERIA REGARDING SPRAY SATISFIED													
9. CRITERIA REGARDING SUBMERGENCE SATISFIED													
10. CRITERIA REGARDING RADIATION SATISFIED													
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED													
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED													
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED													
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED													
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED													
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)													
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)													
I.A EQUIPMENT QUALIFIED				X	X	X							
I.B EQUIPMENT QUALIFICATION PENDING MODIFICATION	X	X	X								X		
II.A EQUIPMENT QUALIFICATION NOT ESTABLISHED							X	X	X				
II.B EQUIPMENT NOT QUALIFIED													
II.C EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED													
III.A EQUIPMENT EXEMPT FROM QUALIFICATION													
III.B EQUIPMENT NOT IN THE SCOPE OF THE REVIEW													
IV DOCUMENTATION NOT MADE AVAILABLE										X			
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)													
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT											X		
2. EQUIPMENT MODIFICATION													
3. EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL													
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE													
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS													
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT											.		
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS	X	X	X										
8. OTHER (___SEE SPECIFIC EQUIPMENT ITEM IF CHECKED___)													
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED											X		

4.3 METHODOLOGY USED BY THE LICENSEE

This section includes observations concerning the Licensee's qualification methodology presented in the response [18] to the NRC SER.

4.3.1 Completeness of Safety-Related Equipment List

Section 3.1 of the NRC SER [17] identified the following concern:

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

The licensee identified 553 items of equipment which were addressed 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 [18]:

"A list of display instrumentation referenced in the Emergency Procedures is provided in Table 1 [see Appendix C of this TER]. The equipment in Table 1 has been divided into three categories.

Category A - Display instrumentation which has been previously included on the master list of the I.E. Bulletin 79-01B 90 Day Review, Revision 3. The appropriate worksheet page number for each item in this category can be found in Table 1.

Category B - Display instrumentation which is in a harsh environment but not previously listed on the master list of I.E. Bulletin 79-01B 90 Day Review, Revision 3. Equipment in this category has been added to the master list of I.E. Bulletin 90 Day Review, Revision 4, as a result of our review of the Emergency Procedures. The appropriate worksheet page number for the equipment in this category can be found in Table 1.

The qualification status and proposed corrective action of equipment in Category B is as follows:

LT-RS251A, B — Containment Sump Level

This equipment is being replaced as part of the TMI Lessons-Learned modifications. The transmitters were included on the master list for the TMI Review Supplement 3 response submitted February 1, 1981.

PT-2402 — RCS Wide Range Pressure

PT-RC2401-1 — RCS Wide Range Pressure

LT-2477, 87, 97 — Steam Generator Wide Range Pressure

PT-RS256A, B — Outside Recirculation Spray Pump Discharge Pressure

FT-2961, 62, 63 — Cold Leg. SI Flow

FT-2945, 46 — Low Head Injection Header Flow

The sensor, cable and terminations of the indication listed above will be reviewed for qualification. Those portions of the instrumentation loop that are exposed to a harsh environment will be upgraded with qualified equipment. This will ensure that the operator will not be provided with erroneous indication due to the effects of a harsh environment on this equipment in the event of a LOCA or MSLB.

The majority of the display instrumentation in the Surry control room is supplied directly from protection channels. However, to ensure the integrity of the trip function, an isolation device is provided to supply the indicator so that faults at the indicator will not be reflected into the safety trip portion of the circuit. Therefore, the cables that run from the safety trip circuit to the indicator are not treated as Class 1E cables with respect to cable separation. This approach allows for redundant indicators to be positioned side-by-side for comparison of readings.

Qualification of Post Accident Monitoring equipment referenced in the Emergency Procedures is a new requirement. Vepco will review the qualification status of this equipment and advise the NRC of the schedule for implementation of any required corrective action by June 30, 1982.

Category C - Display instrumentation which is not exposed to a harsh environment. These components will be included on the master list for equipment which is in a mild environment and will be reviewed as such. At present there is no requirement to provide Component Evaluation sheets for equipment in a mild environment."

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

4.3.2 Containment Spray System

Section 3.2 of the NRC SER [17] identified the following concern:

"During this review, the staff assumed that for plants designed and equipped with an automatic containment spray system which satisfies the single-failure criterion, the main-steam-line-break (MSLB) environmental conditions are enveloped by the large-break-LOCA environmental conditions. The staff assumed, and requires the licensee to verify, that the containment spray system is not subjected to a disabling single-component failure and therefore satisfies the requirements of Section 4.2.1 of the DOR guidelines.

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

In response to this concern, the Licensee stated [18]:

"A description of the containment spray systems at Surry is provided in Section 6.3.1.4 of the Surry FSAR. This system contains redundant 100% capacity trains which are not subjected to a disabling single-component failure."

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 [17] identified the following concern:

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

	Max Temp (°F)	Max Press (psig)	Humidity (%)
LOCA	278	45	100
MSLB	not provided	not provided	not provided

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

The licensee's specified temperature (service condition) of 278°F does not satisfy the above requirement. A saturation temperature corresponding to the pressure profile (292°F peak temperature at 45 psig) should be used instead. The licensee should update his equipment summary tables to reflect this change. If there is any equipment that does not meet the staff position, the licensee must provide either justification that the equipment will perform its intended function under the specified conditions or propose corrective action."

The Licensee responded to the NRC concern as follows [18]:

"Stratification would only be present for a short time period (since the containment spray system becomes effective within 100 seconds) following a LOCA or MSLB. The spray delivery to the upper regions of the containment would quickly cool the stratified region.

No safety-related electrical equipment is located in the upper third of the containment volume. This precludes any equipment from being exposed to a higher-than-average temperature due to stratification in the upper regions of the containment following a LOCA or MSLB.

Even if safety related electrical equipment were located in the upper third of the containment volume, the computer codes and models used to calculate the maximum containment average temperature of 278°F for LOCA contain significant conservatisms such that the calculated temperature is an overprediction of the expected average temperature. These conservatisms include:

(1) the blowdown model, which maximizes release rates to the containment

(2) overprediction of the energy available for release to the containment

(3) underprediction of the containment heat sinks and containment volume

(4) assuming the most severe containment initial conditions

(5) minimizing containment spray heat removal

(6) the modeling of the behavior of the break effluent to maximize the containment pressure and temperature.

The combination of all these factors results in calculated containment pressure and temperature transients which are substantially greater than expected values. Therefore, there is sufficient margin in the calculated temperature to account for stratified regions of higher-than-average temperatures for an MSLB.

Stratification of steam in the upper regions of the containment is not expected to occur after a LOCA. The location of the break is below the operating floor in the lower portion of the containment. The high, subcooled liquid blowdown rates will result in a high degree of mixing which will prevent the accumulation of stratified steam.

A sample of the methodology used to determine the inside containment LOCA profiles can be found in the Environmental Zone Descriptions for Surry Power Station behind Reference Tab #2.[1]

[1]A copy of the Environmental Zone Descriptions (EZD) Surry Power Stations Units 1 and 2 are provided with the SER response."

~~It appears that~~ the Licensee has ~~not~~ resolved the NRC concern. Since the Licensee is responsible for identifying the environments, the parameters identified by the Licensee have been used in the evaluations contained in this Technical Evaluation Report. These parameters are reproduced in Appendix A.

4.3.3.2 Temperature, Pressure, and Humidity Conditions Outside Containment

Section 3.4 of the NRC SER [17] stated the following:

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

(1) Auxiliary building
(2) Auxiliary building charging pump cubicle

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

4.3.3.3 Nuclear Radiation Dose (Inside and Outside Containment)

Section 3.8 of the NRC SER [17] identified the following concern:

"The licensee has provided values for the radiation levels postulated to exist following a LOCA. The application and methodology employed to determine these values were presented to the licensee as part of the NRC staff criteria contained in the DOR guidelines, in NUREG-0588, and in the

guidance provided in IEB-79-01B, Supplement 2. Therefore, for this review, the staff has assumed that, unless otherwise noted, the values provided have been determined in accordance with the prescribed criteria. The staff review determined that the values to which equipment was qualified enveloped the requirements identified by the licensee.

The radiation values provided by the licensee for inside containment for total integrated dose range from 7.44×10^6 to 3.41×10^9. The radiation service condition provided by the licensee is lower than provided in the DOR guidelines (4×10^7 rads) for gamma and beta radiation. The licensee is requested to either provide justification for using the lower service condition or use the service condition provided in the DOR guidelines for both gamma and beta radiation. If the former option is chosen, the analysis--including the basis, assumptions, and a sample calculation--should be provided.

A required value outside containment of 8×10^6 rads has been used by the licensee to specify limiting radiation levels within the charging pump cubicle. This value appears to consider the radiation levels influenced by the source term methodology associated with post-LOCA recirculation fluid lines and is therefore acceptable."

In response to this concern, the Licensee stated [18]:

"The calculated total integrated gamma radiation doses inside containment range from 7.4×10^6 to 3.8×10^7 rads, depending on the location of the dose points. They are shown in Table 2. The radiation doses were calculated based on power level of 2546 MW thermal and containment free volume of 1.8×10^6 ft^3. The shielding credit of crane wall and operating floor was taken into consideration. A sample calculation is provided in the Environmental Zone Descriptions for Surry Power Station behind Reference Tab #3.

TABLE 2

40-year normal plus LOCA gamma dose inside containment

Location		Dose (rads)
el. 47'4"	- Inside crane wall	3.7×10^7
el. 47'4"	- Outside crane wall	7.4×10^6
el. 18'4"	- Outside crane wall	7.4×10^6
el. (-) 3'6"	- Inside crane wall	3.7×10^7
el. (-) 3'6"	- Outside crane wall	7.4×10^6
el. (-)27'7"	- Above sump water	3.5×10^7
el. (-)27'7"	- Submerged in sump water	3.8×10^7"

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

4.3.4 Chemical Spray

Section 3.6 of the NRC SER [17] identified the following concern:

"The licensee's submittal and reference are not clear on the subject of chemical spray solution and concentration. Moreover, there seem to be inconsistencies between the pH of 8.5-11 specified in the reference and the qualification values on the CES in the submittal. 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 [18]:

"The component evaluation sheets have been revised to show consistent units for chemical spray concentration. Each component on the master list which is subjected to chemical sprays has been reviewed to ensure that the chemical spray environment in the test report envelops the specified chemical spray environment. The results of the review are indicated on the worksheets included in Revision 4 of the IE Bulletin 79-01B 90 Day Review. Specific chemical spray deficiencies which were identified in Appendix B have also been reviewed and resolutions to these deficiencies are indicated on the Revision 4 component evaluation worksheets.

Details of the qualification review for chemical spray can be found in the qualification review packages contained in the central file."

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 [17] 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 at the 21 ft 11 in. elevation. The licensee identified three safety-related electrical components for Unit 1 and three for Unit 2 as having the potential for becoming submerged after a postulated event.

The licensee stated that these components--6 motor-operated valves--will have completed their function before becoming submerged. In this regard, the licensee should provide an assessment of the failure modes associated with the submergence of the valves. The licensee should also provide assurance that the subsequent failure of these components will not adversely affect any other safety functions or mislead an operator. Additionally, the licensee should discuss operating time, across the spectrum of events, in relation to the time of submergence. If the results of the licensee's assessment are acceptable, then the valves may be exempt from the submergence parameter of qualification.

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

In response to this concern, the Licensee stated [18]:

"1. Inside Reactor Containment Building

The methodology used to determine the submergence level inside containment is provided for your review in the Environmental Zone Descriptions for Surry Power Station behind Reference Tab #6. This methodology is in accordance with the requirements of I.E. Bulletin 79-01B.

The maximum fluid level in the calculation is elevation -21'11" to which all components were reviewed. The 6 motor operated valves (MOV 1865 A, B, C and MOV 2865 A, B, C) are below the submergence level.

These motor operated valves have been removed from the master list. The valves serve to isolate the safety injection accumulator tanks during refueling. They are administratively locked open whenever the reactor is critical by locking out the breakers that supply power to the valves. The valves will then remain in their locked open position and available to mitigate the consequences of a LOCA or MSLB. No power is supplied to these motor operated valves during critical operation; therefore, there can be no adverse effects to the electrical bus which normally supplies power to the valves. There is no position indication on these valves, thus the operator cannot be misled due to the submergence of the valves. Since the valves are locked open, the question of operating time across the spectrum of events in relation to submergence need not be addressed.

2. Outside Reactor Containment Building

Submergence outside of containment was not specifically addressed during the I.E. Bulletin 79-01B 90 Day Review. The effects of

piping system breaks outside of containment was analyzed in Appendix D of the Surry FSAR. This review takes into account the effects of discharging fluids that may result in failure of equipment important to safety.

A detailed review of the effects of flooding on equipment important to safety is provided in the North Anna FSAR Appendix C, Effects of Piping System Breaks Outside Containment. The Auxiliary Building was the only area affected by the postulated high-energy line breaks with regard to submergence. The maximum water level in the Auxiliary Building is 1 inch above the floor. All equipment important to safety was found to be at least 15 inches above the floor.

A similar review of the effects of flooding was not done for Surry. We can determine for Surry, however, that no equipment outside of containment important to safety will become submerged due to the postulated pipe breaks because of the similarity in design of the piping systems, the Auxiliary Building layout, and equipment location for North Anna and Surry.

Since we have determined that there is no equipment outside containment that would be subjected to submergence due to a LOCA or HELB, the submergence column on the Component Evaluation Sheet has been marked Not Required (NR)."

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

4.3.6 Aging and Qualified Life

Section 3.7 of the NRC SER [17] identified the following concern:

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

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

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

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

The licensee stated that all Class 1E electrical equipment is assessed for operability at specified time intervals by systematic application of the plant periodic test program. The licensee also stated (1) that a preliminary program was developed by December 1, 1980 to determine whether equipment inoperability was caused by aging, and (2) that the use of the periodic test program, together with a detailed analysis of all Class 1E inoperable equipment and other sources of information, should satisfy the aging requirement and provide assurance that Class 1E equipment and components will perform when needed.

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 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 [18]:

"Vepco has not fully developed an aging evaluation program to meet the current requirements for addressing aging as outlined in the Safety Evaluation Report and as discussed in the meetings held in Bethesda on July 7-10, 1981. As indicated previously in I.E. Bulletin 79-01B 90 Day Review, Revision 3, a program to assess the failure mechanisms of all class IE electrical equipment has been developed and implemented at Surry.

The Atomic Industrial Forum is currently drafting a position paper which Vepco feels has merit with regard to addressing the aging concerns. Implementation of this program is contingent, however, on review of the existing preventive maintenance program at the station. Vepco is currently reviewing the draft AIF position paper on aging evaluation methods in conjunction with the existing preventive maintenance program at Surry. an aging evaluation program which meets the requirements of the SER will be implemented by June 1982.

Below is the program being proposed by the AIF:

3.7.1 Discussion

The purpose of qualifying safety-related equipment in a harsh environment is to assure that when the equipment is subjected to severe environmental stresses from a design-basis event, common mode failures will not occur in redundant safety systems. The purpose of including aging as part of the qualification process is to assure that such equipment will perform its safety functions in its 'end-of-useful-life' as well as in its 'as-new' condition. Such a demonstration must consider the design, manufacture, testing, installation, operation, maintenance, and replacement of the equipment.

However, the evaluation of aging, as practiced in the nuclear power industry, embodies the concept of preconditioning a piece of equipment by putting it in a simulated advanced stage of life. This practice is extended to determine an expected (i.e., qualified) life for that piece of equipment if, following the preconditioning, the equipment can be demonstrated to perform its intended function successfully when exposed to a harsh environment.

The aging and qualified-life concept is sound and logical in principle. In practice, however, industry research and experience has demonstrated that aging is still at the leading edge of technology; this statement is based on the following:

(1) The most common method to achieve a preconditioning of equipment is to use some form of accelerated stressing. This requires the identification of the various environmental parameters (i.e., temperature, pressure, humidity, radiation, vibration, and chemical environment) that cause stress. An appropriate acceleration technique must be established for each type of stress that is identified. The simultaneous simulated acceleration of some or all of these parameters (e.g., radiation, temperature, humidity), as would occur in the plant, is not always practical or feasible. In addition, some of these parameters (e.g., humidity and chemical environment) do not lend themselves to acceleration.

(2) When accleration is practical, the methods used (such as the Arrhenius technique and the 10 degree C rule for thermal aging, and an increased dose rate for radiation) are approximate and subject to arbitrary assumptions. Electric Power Research Institute Report NP-1558, 'A Review of Equipment Aging Theory and Technology,' demonstrates this fact.

The DOR Guidelines recognize this state-of-the-art limitation, as demonstrated by the staff position in Section 7, 'Aging,' which states:

> Implicit in the staff position in Regulatory Guide 1.89 with regard to backfitting IEEE Std. 323-1974 is the staff's conclusion that the incremental improvement in safety from arbitrarily requiring that a specific qualified life be demonstrated for all Class 1E equipment is not sufficient to justify the expense for plants already constructed and operating.

Section 7 continues that:

> This position does not, however, exclude equipment using materials that have been identified as being susceptible to significant degradation due to thermal and radiation aging. Component maintenance or replacement schedules should include considerations of the specific aging characteristics of the component materials. Ongoing programs should exist at the plant to review surveillance

and maintenance records to assure that equipment which is exhibiting age related degradation will be identified and replaced as necessary.

Section 3.7.2 outlines the proposed program. When implemented this program wll satisfy the aging requirements in the DOR Guidelines and the Safety Evaluation Report.

3.7.2 Aging Evaluation Program

To address the aging evaluation program in a disciplined manner, each safety related Class 1E equipment located in potentially harsh environment areas and identified in the component evaluation worksheet will be reviewed individually and classified into three categories as follows, based on their qualification methods:

Category A - Equipment tested under LOCA/HELB conditions with preaging included in the test program

Category B - Equipment tested under LOCA/HELB conditions without preaging in the test program

Category C - Equipment not tested under LOCA/HELB conditions

3.7.2.1 Category A

Category A includes the equipment which was qualified by type tests. These type tests include (1) simulated aging test including thermal, radiation aging, and mechanical and electrical cycling where applicable, and (2) design-basis-event tests to verify the equipment's functional capability following simulated aging. In these cases a qualified-life estimate, based on most limiting of the thermal and radiation aging tests, was established. For this equipment, an Ongoing Aging evaluation and replacement schedule will be factored into an existing surveillance program, which includes:

3.7.2.1.1 The performance of routine preventive maintenance in accordance with established procedures based on manufacturer's recommendations and plant operating experience.

3.7.2.1.2 Parts replacements on which the expected qualified-life is contingent. Based on the review of the qualification tests and the results thereof Vepco has identified the parts replacements such as gaskets and lubricants that are required. The existing preventive maintenance programs for each piece of equipment will be revised to include these.

3.7.2.1.3 The evaluation of equipment failures to identify any trends that indicate a potential for common mode failure so corrective actions can be initiated. The failure evaluation program will specifically address the following.

A record will be maintained of all failures of safety related Class 1E equipment. Periodically failure records will be reviewed to determine:

(a) Repetitive nature

(1) Is the same type failure occurring on the same equipment and at some definite intervals?

(2) Is the same type failure occurring at a definite interval on similar equipment?

(b) Timing of the failures with respect to any environmental condition changes

(c) Other causes indicative of equipment in-service aging degradation.

Vepco currently has an administrative procedure that addresses this requirement. This procedure when fully developed and implemented will provide the additional information required to detect impending age related failure and initiate corrective action.

3.7.2.1.4 Review of periodic operational test and calibration records to spot any clues for developing age related failure mechanism.

3.7.2.2 Category B

Category B includes the equipment for which the qualification has been based on LOCA/HELB tests that are coupled with engineering analyses to address aging. The engineering analyses might include (1) a material evaluation to identify weak links and (2) a comparison of test data on generic materials, or an extrapolation of conservatisms contained in the LOCA/HELB testing. In these cases, the establishment of an estimated qualified life or replacement schedule has been based on engineering analyses. For this equipment, Ongoing Aging evaluation will consist of:

3.7.2.2.1 The performance of routine preventive maintenance in accordance with established procedures based on manufacturers' recommendations and plant operating experience.

3.7.2.2.2 Parts replacements on which the expected qualified-life is contingent. Based on the review of the qualification tests and the results thereof Vepco has identified the parts replacements such as gaskets and lubricants that are required. The existing preventive maintenance programs for each piece of equipment will be revised to include these.

3.7.2.2.3 The evaluation of equipment failures to identify any trends that indicate a potential for common mode failure so corrective actions can be initiated. The failure evaluation program will specifically address the following.

(a) Repetitive nature

(1) Is the same type failure occurring on the same equipment and at some definite intervals?

(2) Is the same type failure occurring at a definite interval on similar equipment?

(b) Timing of the failures with respect to any environmental condition changes

(c) Other causes indicative of equipment in-service aging degradation.

Vepco currently has an administrative procedure that addresses this requirement. This procedure when fully developed and implemented will provide the additional information required to detect impending age related failure and initiate corrective action.

3.7.2.2.4 Review of periodic operational test and calibration records to spot any clues for developing age related failure mechanism.

3.7.2.2.5 An equipment monitoring program to augment engineering analyses for aging.

An example of this monitoring program could be the periodic review of motor-winding temperatures, starting current or running currents to identify any trends that indicate performance degradation. The results of this review would form the basis for initiating corrective action.

3.7.2.3 Category C

Category C includes the few pieces of equipment for which qualification has been demonstrated by analysis only. This equipment is exposed to a limited number of harsh environment parameters, which are substantially lower than they would be for Category A or B. An example would be the equipment in the pump rooms, where the only harsh parameter is the radiation that results from recirculating fluid lines or a transient temperature spike from a HELB accident.

3.7.2.3.1 The performance of routine preventive maintenance in accordance with established procedures based on manufacturers' recommendations and plant operating experience.

3.7.2.3.2 Parts replacements on which the expected qualified-life is contingent. Based on the review of the qualification tests and the results thereof Vepco has identified the parts replacements such as gaskets and lubricants that are required. The existing preventive maintenance programs for each piece of equipment will be revised to include these.

3.7.2.3.3 The evaluation of equipment failures to identify any trends that indicate a potential for common mode failure so corrective actions can be initiated. The failure evaluation program will specifically address the following.

(a) Repetitive nature

(1) Is the same type failure occurring on the same equipment and at some definite intervals?

(2) Is the same type failure occurring at a definite interval on similar equipment?

(b) Timing of the failures with respect to any environmental condition changes

(c) Other causes indicative of equipment in-service aging degradation.

Vepco currently has an administrative procedure that addresses this requirement. This procedure when fully developed and implemented will provide the additional information required to detect impending age related failure and initiate corrective action.

3.7.2.3.4 Review of periodic operational test and calibration records to spot any clues for developing age related failure mechanism.

3.7.2.3.5 A specific maintenance test program designed to augment the engineering analysis for the specific area of concerns (e.g., replacement of gaskets, O-rings, etc.)

3.7.3 Conclusion

The program outlined above reflects a practical approach to aging evaluation, consistent with the requirments of the DOR Guidelines and the requirements as outlined in the Safety Evaluation Report. Vepco believes that the implementation of this program will provide an extra measure of confidence in safety-related equipment capabilities on a continuing basis."

It is concluded that the Licensee has provided a satisfactory response to the NRC concern, subject to implementation of the described program.

4.4 EQUIPMENT ENVIRONMENTAL QUALIFICATION EVALUATION

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION
EQUIPMENT ITEM CHECKSHEET INDEX
SURRY 2

FRC ITEM NO.	COMPONENT	MANUFACTURER	MODEL NUMBER	LOCATION
1	PRESSURE TRANSMITTER	FISCHER AND PORTER	50EP1031BCXA	SFGD-1 SAFEGUARDS AREA
2	PRESSURE TRANSMITTER	ROSEMOUNT	1153AGD9	RC-3B INSIDE CONTAINMENT OUTSIDE CR
3	PRESSURE TRANSMITTER	FISCHER AND PORTER	50EP1041BCXANS	RC-3B INSIDE CONTAINMENT OUTSIDE CR
4	PRESSURE TRANSMITTER	FISCHER AND PORTER	50EP1041BCXANS	TB-35 TURBINE BUILDING
5	PRESSURE TRANSMITTER	FISCHER AND PORTER	50EP1041BCXANS	MSVH-27 MAIN STEAM VALVE HOUSE
6	PRESSURE TRANSMITTER	FISCHER AND PORTER	50EN1071BCXA	AUXILIARY BUILDING
7	ELECTRICAL PENETRATION	AMPHENOL	TYPE III	RC-18B INSIDE AND OUTSIDE CONTAINME
8	ELECTRICAL PENETRATION	AMPHENOL	TYPE 1C	RC-18B INSIDE AND OUTSIDE CONTAINME
9	ELECTRICAL PENETRATION	AMPHENOL	TYPE 1B	RC-18B INSIDE AND OUTSIDE CONTAINME
10	ELECTRICAL PENETRATION	AMPHENOL	TYPE IA	RC-18B INSIDE AND OUTSIDE CONTAINME
11	ELECTRICAL PENETRATION	CONAX	ND	RC-18B INSIDE AND OUTSIDE CONTAINME
12	FLOW TRANSMITTER	BARTON	386	RC-27B INSIDE CONTAINMENT OUTSIDE C
13	FLOW TRANSMITTER	ROSEMOUNT	1152DP5	SFGD-1 SAFEGUARDS AREA
14	FLOW TRANSMITTER	FISCHER AND PORTER	10B2496QBNS	RC-18B INSIDE CONTAINMENT OUTSIDE C
15	FLOW TRANSMITTER	FISCHER AND PORTER	10B2496PB	RC-47B INSIDE CONTAINMENT OUTSIDE C
16	LEVEL TRANSMITTER	ROSEMOUNT	1153ADP5	RC-3B INSIDE CONTAINMENT OUTSIDE CR
17	LEVEL TRANSMITTER	GEMS	XM54853/XM54854	INSIDE CONTAINMENT OUTSIDE CRANEWAL
18	LEVEL TRANSMITTER	BARTON	386	RC-18B INSIDE CONTAINMENT OUTSIDE C
19	LEVEL TRANSMITTER	ROSEMOUNT	1153DA4	RC-3B INSIDE CONTAINMENT OUTSIDE CR
20	TERMINAL BLOCK	GENERAL ELECTRIC	ND	RC-3A INSIDE CONTAINMENT
21	TERMINAL BLOCK	BUCHANAN	ND	RC-3A INSIDE CONTAINMENT
22	TERMINAL BLOCK	BURNDY	ND	RC-3A INSIDE CONTAINMENT
23	LIMIT SWITCH	ND	ND	RC-3A INSIDE CONTAINMENT
24	TEMPERATURE ELEMENT	ROSEMOUNT	176KS	INSIDE CONTAINMENT, INSIDE CRANEWAL
25	ELECTRIC MOTOR	WESTINGHOUSE	PC090#0L	SB-9B MECHANICAL EQUIPMENT ROOM NO.
26	MOTORIZED VALVE ACTUATOR	RCS, INC.	TYPE BL	AB-45 AUXILIARY BUILDING VENTILATIO
27	HYDROGEN RECOMBINER	WESTINGHOUSE	A	RC-47B INSIDE CONTAINMENT OUTSIDE C
28	HYDROGEN ANALYZER	BENDIX	THERMATRON T3	AB-13A (N) AUXILIARY BUILDING 13'0"
29	PANEL, I AND C	WESTINGHOUSE	A	AB-13B AUXILIARY BUILDING CABLE VAU
30	ELECTRICAL CABLE, THERMOCOUPLE	AMPHENOL	TYPE IV	RC-18B INSIDE AND OUTSIDE CONTAINME
31	FLOW CONTROLLER	FISCHER AND PORTER	546	AB-2B AUXILIARY BUILDING
32	ELECTRICAL CABLE	KAISER	XLPE/NEOPRENE	AB-27 OUTSIDE CONTAINMENT
33	ELECTRICAL CABLE	OKONITE	XLPE/NEOPRENE	AB-27 OUTSIDE CONTAINMENT
34	ELECTRICAL CABLE	COLLYER INSULATED WIRE	XLPE/NEOPRENE	OUTSIDE CONTAINMENT
35	ELECTRICAL CABLE	CONTINENTAL WIRE	SILICON RUBBER	INSIDE CONTAINMENT INSIDE CRANEWALL
36	ELECTRICAL CABLE, INSTRUMENT	CONTINENTAL WIRE	XLPE/HYPALON	RC-3A INSIDE CONTAINMENT, INSIDE CR
37	ELECTRICAL CABLE	OKONITE	OKONITE OKOPRENE	RC-3A INSIDE CONTAINMENT, INSIDE CR
38	ELECTRICAL CABLE	ANACONDA WIRE AND CABLE	XLPE/NEOPRENE	RC-3A INSIDE CONTAINMENT, INSIDE CR
39	ELECTRICAL CABLE, POWER	COLLYER INSULATED WIRE	XLPE/NEOPRENE	RC-3A INSIDE CONTAINMENT, INSIDE CR
40	ELECTRICAL CABLE, CONTROL	OKONITE	EP/NEOPRENE	RC-3A INSIDE CONTAINMENT, INSIDE CR
41	ELECTRICAL CABLE, CONTROL	CONTINENTAL WIRE	XLPE/NEOPRENE	RC-3A INSIDE CONTAINMENT, INSIDE CR
42	ELECTRICAL CABLE, CONTROL	GENERAL ELECTRIC	XLPE/NEOPRENE	RC-3A INSIDE CONTAINMENT, INSIDE CR
43	ELECTRICAL CABLE, INSTRUMENT	RAYCHEM	FLAMTROL	RC-3A INSIDE CONTAINMENT, INSIDE CR
44	ELECTRICAL CABLE, INSTRUMENT	CERRO WIRE AND CABLE	XLPE/NEOPRENE	RC-3A INSIDE CONTAINMENT, INSIDE CR
45	ELECTRICAL CABLE, INSTRUMENT	BOSTON INSULATED WIRE	XLPE/NEOPRENE	RC-3A INSIDE CONTAINMENT, INSIDE CR
46	ELECTRICAL CABLE, CONTROL	CERRO WIRE AND CABLE	FIREWALL III	RC-3A INSIDE CONTAINMENT, INSIDE CR
47	ELECTRIC MOTOR	GENERAL ELECTRIC	5KC37JG770X	MSVH-11 MAIN STEAM VALVE HOUSE
48	ELECTRIC MOTOR	GENERAL ELECTRIC	5K145DL190KF	SB-9B SERVICE BUILDING MECHANICAL E
49	ELECTRIC MOTOR	U.S. ELECTRIC MOTORS	AV9	SB-9B SERVICE BUILDING MECHANICAL E

EQUIPMENT ENVIRONMENTAL QUALIFICATION
EQUIPMENT ITEM CHECKSHEET INDEX
SURRY 2

FRC ITEM NO.	COMPONENT	MANUFACTURER	MODEL NUMBER	LOCATION
50	ELECTRIC MOTOR	WESTINGHOUSE	ABDP	SFGD-1 SAFEGUARD AREA
51	ELECTRIC MOTOR	GENERAL ELECTRIC	5K6287XH41A	SFGD-1 SAFEGUARDS AREA
52	ELECTRIC MOTOR	GENERAL ELECTRIC	5K6227XH206A	SB-9B MECHANICAL EQUIP. ROOM NO. 3
53	ELECTRIC MOTOR	ALLIS CHALMERS	20783FM28	SB-9B MECHANICAL EQUIP. ROOM NO.3
54	ELECTRIC MOTOR	ALLIS CHALMERS	20783FM19	SB-9B MECHANICAL EQUIP. ROOM NO.3
55	ELECTRIC MOTOR	ALLIS CHALMERS	20783FM	SB-9B MECHANICAL EQUIP. ROOM NO.3
56	ELECTRIC MOTOR	GENERAL ELECTRIC	5K6319XJ1D	RC-27A INSIDE CONTAINMENT, INSIDE C
57	ELECTRIC MOTOR	SIEMENS-ALLIS	444TS	AB-45 AUXILIARY BUILDING VENTILATIO
58	ELECTRIC MOTOR	ND	ND	MSVH-27 MAIN STEAM VALVE HOUSE
59	ELECTRIC MOTOR	ND	ND	AUXILIARY BUILDING
60	ELECTRIC MOTOR	GENERAL ELECTRIC	5K182DL1342A	AB-2B AUXILIARY BUILDING PENETRATIO
61	ELECTRIC MOTOR	GENERAL ELECTRIC	5K182DL126	AB-2B AUXILIARY BUILDING PENETRATIO
62	ELECTRIC MOTOR	WESTINGHOUSE	68F13318	AB-2C AUXILIARY BUILDING CHARGING P
63	ELECTRIC MOTOR	CUTLER HAMMER	UNITROL	AB-13B AUXILIARY BUILDING CABLE VAU
64	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB000	MSVH-11 MAIN STEAM VALVE HOUSE
65	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	SERVICE BUILDING
66	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB SIZE 000,1,2	SFGD-1 SAFEGUARDS
67	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	AB-2B AUXILIARY BUILDING PENETRATIO
68	MOTORIZED VALVE ACTUATOR	LIMITORQUE	PEERLESS CLASS B INSULATION	SFGD-1 SAFEGUARD AREA
69	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	AB-13A (S) AUXILIARY BUILDING
70	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB3	INSIDE CONTAINMENT, INSIDE CRANEWAL
71	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMC04	SFGD-1 SAFEGUARDS
72	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB000	SB-9B MECHANICAL EQUIPMENT ROOM NO.
73	ELECTRICAL CABLE, CONTROL	CERRO WIRE AND CABLE	PYRO TROL III	RC-3A INSIDE CONTAINMENT INSIDE CRA
74	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB000	CSPH-11 CONTAINMENT SPRAY PUMP HOUS
75	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMC04	CSPH-27 CONTAINMENT SPRAY PUMP HOUS
76	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB, CLASS B INSULATION, SIZES	AB-2C AUXILIARY BUILDING CHARGING P
77	MOTORIZED VALVE ACTUATOR	LIMITORQUE	CLASS B INSULATION	AB-2B AUXILIARY BUILDING PENETRATIO
78	SOLENOID VALVE	ASCO	NP8320179E	INSIDE CONTAINMENT OUTSIDE CRANEWAL
79	SOLENOID VALVE	ASCO	ND	AB-2B AUXILIARY BUILDING PENETRATIO
80	SOLENOID VALVE	ASCO	8320A102	AB-2B AUXILIARY BUILDING PENETRATIO
81	SOLENOID VALVE	ASCO	NP8320A179V	INSIDE CONTAINMENT OUTSIDE CRANEWAL
82	SOLENOID VALVE	ASCO	2068323RF	RC-3B INSIDE CONTAINMENT OUTSIDE CR
83	SOLENOID VALVE	ASCO	830281RF	AB-2B AUXILIARY BUILDING PENETRATIO
84	SOLENOID VALVE	ASCO	2068323RF	AB-2B AUXILIARY BUILDING PENETRATIO
85	SOLENOID VALVE	ASCO	8320A102	AB-2B AUXILIARY BUILDING PENETRATIO
86	SOLENOID VALVE	ASCO	ND	RC-3B INSIDE CONTAINMENT OUTSIDE CR
87	SOLENOID VALVE	ASCO	8302C4U	AB-2C AUXILIARY BUILDING CHARGING P
88	SOLENOID VALVE	ASCO	LB8316S	AB-2B AUXILIARY BUILDING PENETRATIO
89	SOLENOID VALVE	ASCO	ND	RC-47A INSIDE CONTAINMENT INSIDE CR
90	SOLENOID VALVE	LAWRENCE	3300WA742DC	RC-47A INSIDE CONTAINMENT INSIDE CR
91	SOLENOID VALVE	ASCO	HBX8320A12	RC-3B INSIDE CONTAINMENT OUTSIDE CR
92	SOLENOID VALVE	ASCO	HBX8320A12	AB-2B AUXILIARY BUILDING PENETRATIO
93	SOLENOID VALVE	ASCO	HT8316C47E	AB-2B AUXILIARY BUILDING PENETRATIO
94	SOLENOID VALVE	ASCO	NP8316A76E	AB-2B AUXILIARY BUILDING PENETRATIO
95	SOLENOID VALVE	ASCO	HT8316CE7E	AB-2B AUXILIARY BUILDING PENETRATIO
96	SOLENOID VALVE	ASCO	NP8320A174E	AB-2B AUXILIARY BUILDING PENETRATIO
97	SOLENOID VALVE	ASCO	80174	AB-2B AUXILIARY BUILDING PENETRATIO
98	SOLENOID VALVE	ASCO	80147	MSVH-27 MAIN STEAM VALVE HOUSE

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SURRY 2

FRC ITEM NO.	COMPONENT	MANUFACTURER	MODEL NUMBER	LOCATION
99	SOLENOID VALVE	ASCO	8320A102	AB-13A(N) AUXILIARY BUILDING
100	SOLENOID VALVE	ASCO	HBX8320A26	AB-2B AUXILIARY BUILDING PENETRATIO
101	SOLENOID VALVE	ASCO	NP8320A179E	RC-3B INSIDE CONTAINMENT OUTSIDE CR
102	SOLENOID VALVE	ASCO	NP8320A173V	AB-2B AUXILIARY BUILDING PENETRATIO
103	SOLENOID VALVE	ASCO	NP831654V	RC-3A INSIDE CONTAINMENT INSIDE CRA
104	SOLENOID VALVE	ASCO	831654	AB-2B AUXILIARY BUILDING PENETRATIO
105	SOLENOID VALVE	ASCO	LP831654	INSIDE CONTAINMENT INSIDE CRANEWALL
106	SOLENOID VALVE	ASCO	HBX8320A26	MSVH-27 MAIN STEAM VALVE HOUSE
107	ELECTRICAL CABLE	KAISER	XLPE/NEOPRENE	RC-3A INSIDE CONTAINMENT INSIDE CRA
108	ELECTRICAL CABLE SPLICE	ND	ND	RC-3A INSIDE CONTAINMENT
109	MOTORIZED VALVE ACTUATOR	LIMITORQUE	H28C, CLASS B INSULATION	SFGD-1 SAFEGUARDS
110	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB, CLASS B INSULATION, SIZES	SFGD-1 SAFEGUARD
111	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00 CLASS B INSULATION	AB-2B AUXILIARY BUILDING PENETRATI
112	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB000	RC-47A INSIDE CONTAINMENT INSIDE CR
113	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00 CLASS B INSULATION	RC-47B INSIDE CONTAINMENT OUTSIDE C
114	MOTORIZED VALVE ACTUATOR	LIMITORQUE	PEERLESS CLASS B INSULATION	AB-2C AUXILIARY BUILDING CHARGING P
115	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SMB00	AB-2C AUXILIARY BUILDING CHARGING P
116	PRESSURE TRANSMITTER	ROSEMOUNT	1152AP7A22PB	AUXILIARY BUILDING
117	SOLENOID VALVE	ASCO	NP831654E	SAFEGUARDS AREA
118	LEVEL TRANSMITTER	GEMS	XM54854/XM54853	INSIDE CONTAINMENT, INSIDE CRANEWAL
119	LEVEL TRANSMITTER	GEMS	XM54854	INSIDE CONTAINMENT, INSIDE CRANEWAL
120	LIMIT SWITCH	NAMCO	EA18031302	SAFEGUARDS AREA
121	ACCELEROMETER	ENDEVCO	2273AM20	INSIDE CONTAINMENT, INSIDE CRANEWAL
122	ELECTRICAL CABLE, COAXIAL	ENDEVCO	3075M6	INSIDE CONTAINMENT, INSIDE CRANEWAL
123	AMPLIFIER	UNHOLTZ-DICKIE	22CA2TR	INSIDE CONTAINMENT, INSIDE CRANEWAL
124	SOLENOID VALVE	VALCOR	V526568319	INSIDE CONTAINMENT, INSIDE CRANEWAL
125	SOLENOID VALVE	VALCOR	V526568319	INSIDE CONTAINMENT, OUTSIDE CRANEWA
126	SOLENOID VALVE	VALCOR	V526529531	AUXILIARY BUILDING
127	LIMIT SWITCH	GORDOS	MR8901	INSIDE CONTAINMENT, INSIDE CRANEWAL
128	LIMIT SWITCH	GORDOS	MR8901	INSIDE CONTAINMENT, OUTSIDE CRANEWA
129	LIMIT SWITCH	GORDOS	MR8901	AUXILIARY BUILDING
130	HYDROGEN ANALYZER	COMSIP DELPHI	KIII	AUXILIARY BUILDING
131	FLOW TRANSMITTER	FISCHER AND PORTER	10B2496QB	RC-18A INSIDE CONTAINMENT OUTSIDE C

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

EQUIPMENT ITEM NO. 1
PRESSURE TRANSMITTER LOCATED IN THE SAFEGUARD AREA (SFGD-1)
FISCHER AND PORTER MODEL 50EP1031BCXA
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 1
LICENSEE REFERENCE(S): NOT CITED
FUNCTION PLANT (ID): OUTSIDE REACTOR SUMP PUMP DISCHARGE (PT-RS-256A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-278, -279

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

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

Not stated, (Not applicable) New Equipment Item

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

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

Not Applicable — New Equipment Item

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

*New Equipment Item — Review is in progress

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

LICENSEE RESPONSE TO NRC SER

Qualification of Post Accident Monitoring equipment referenced in the Emergency Procedures is a new requirement. Vepco will review the qualification status of this equipment and advise the NRC of the schedule for implementation of any required corrective action by June 30, 1982.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

EQUIPMENT ITEM NO. 2
PRESSURE TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ROSEMOUNT MODEL 1153AGD9 XM54854
REQUIRED OPERATING TIME: NOT SPECIFIED
TER CHECKSHEET NO. 2
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): REACTOR COOLANT SYSTEM WIDE RANGE PRESSURE (PT-2402; PT-RC-2402-1)
LICENSEE SUBMITTAL: SCEW(S): 6-273, -274

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

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

Not stated, (Not applicable) New Equipment Item

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

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

Not Applicable — New Equipment Item

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

* See Note 1, page 5f.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

LICENSEE RESPONSE TO NRC SER

Qualification of Post Accident Monitoring equipment referenced in the Emergency Procedures is a new requirement. Vepco will review the qualification status of this equipment and advise the NRC of the schedule for implementation of any required corrective action by June 30, 1982.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

NOTES:

1. The following is a quote from the H.R. Robinson Unit 2 SER response:

"Qualification testing of Rosemount Model 1153, Series A, per Rosemount Report No. 3788 states that the transmitter is qualified per the requirements of IEEE 323-1971. Missing from this report is the aging parameter not required for IEEE 323-1971 but necessary for complete LOCA qualification. Recent Rosemount testing to qualify a transmitter to meet IEEE 323-1974 requirements has resulted in failure. A combination of thermal aging, irradiation and chemical spray test specification parameters has resulted in failed components. The initial failed element was an O-ring comprised of sulphur cured polyethylene rubber. This allowed steam/chemical spray to affect electronic components. The O-ring mode of failure is attributed to high temperature vs. time necessary for the Arrhenius curve time compression to satisfy aging test requirements."

Due to the fact that the Rosemount 1153 Series A transmitters failed a reasonable test, this equipment item must be considered not qualified. and is assigned to NRC category II.b.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

EQUIPMENT ITEM NO. 3
PRESSURE TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
FISCHER AND PORTER MODEL 50EP1041BCXANS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 3
LICENSEE REFERENCE(S): 1584
FUNCTION (PLANT ID): PRESSURIZER PRESSURE INDICATION AND HIGH/LOW PROTECTION (PT-2455 TO -2457)
LICENSEE SUBMITTAL: SCEW(S): 6-185 TO -187

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

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

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

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

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

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

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action : 12/31/82.)

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4 Fischer Porter (Transmitters)

PLANT ID NO.	MODEL NO.	WORKSHEET PAGE NO.
FT-2474	10B2496OB	6-142
FT-2475	10B2496OB	6-142
FT-2484	10B2496OB	6-144
FT-2485	10B2496OB	6-145
FT-2494	10B2496OB	6-146
FT-2495	10B2496OB	6-147
FT-FW-200A	10B2496PB-NS	6-87
FT-FW-200B	10B2496PB-NS	6-88
FT-FW-200C	10B2496PB-NS	6-89
PT-2464	50EP1041BCXA-NS	6-148
PT-2466	50EP1041BCXA-NS	6-149
PT-2468	50EP1041BCXA-NS	6-150
PT-2474	50EP1041BCXA-NS	6-151
PT-2475	50EP1041BCXA-NS	6-152
PT-2476	50EP1041BCXA-NS	6-153
PT-2484	50EP1041BCXA-NS	6-154
PT-2484	50EP1041BCXA-NS	6-155
PT-2486	50EP1041BCXA-NS	6-156
PT-2494	50EP1041BCXA-NS	6-157
PT-2495	50EP1041BCXA-NS	6-158
PT-2496	50EP1041BCXA-NS	6-159
PT-LM-200A	50EN1071BCXA	6-128
PT-LM-200B	50EN1071BCXA	6-129
PT-LM-200C	50EN1071BCXA	6-130
PT-LM-200D	50EN0171BCXA	6-131
PT-2455	10B2496OBXA-NS	6-185
PT-2456	10B2496OBXA-NS	6-186
PT-2457	10B2496OBXA-NS	6-187

7.2.4.1 Modification/Replacement Status

We are presently participating in a transmitter qualification program which is scheduled to be completed by June 1982. We have ordered replacement transmitters of the type being tested (Rosemount Series No. 1153D) to ensure that we will have transmitters available to replace existing types.

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4.2 Modification/Replacement Schedule

Replacement transmitters have been placed on order. Based on current projections for material delivery and our current outage schedule, replacement is scheduled to begin during the last quarter of 1981.

7.2.4.3 Justification For Continued Operation

These transmitters have been environmentally tested and have demonstrated their ability to provide an accident mitigation trip signal when subject to a harsh environment. Therefore, it is concluded that continued operation of the Surry Units in the interim with this equipment will have no effect on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

EQUIPMENT ITEM NO. 4
PRESSURE TRANSMITTER LOCATED IN THE TURBINE BUILDING (TB-35)
FISCHER AND PORTER MODEL 50EP1041BCXANS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 4
LICENSEE REFERENCE(S): 1584
FUNCTION (PLANT ID): STEAM HEADER PRESSURE (PT-2464, -2466, -2468)
LICENSEE SUBMITTAL: SCEW(S): 6-148 TO -150

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

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

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

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

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

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

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action: 12/31/81.)

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO RE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4 Fischer Porter (Transmitters)

PLANT ID NO.	MODEL NO.	WORKSHEET PAGE NO.
FT-2474	10B2496OB	6-142
FT-2475	10B2496OB	6-142
FT-2484	10B2496OB	6-144
FT-2485	10B2496OB	6-145
FT-2494	10B2496OB	6-146
FT-2495	10B2496OB	6-147
FT-FW-200A	10B2496PB-NS	6-87
FT-FW-200B	10B2496PB-NS	6-88
FT-FW-200C	10B2496PB-NS	6-89
PT-2464	50EP1041BCXA-NS	6-148
PT-2466	50EP1041BCXA-NS	6-149
PT-2468	50EP1041BCXA-NS	6-150
PT-2474	50EP1041BCXA-NS	6-151
PT-2475	50EP1041BCXA-NS	6-152
PT-2476	50EP1041BCXA-NS	6-153
PT-2484	50EP1041BCXA-NS	6-154
PT-2484	50EP1041BCXA-NS	6-155
PT-2486	50EP1041BCXA-NS	6-156
PT-2494	50EP1041BCXA-NS	6-157
PT-2495	50EP1041BCXA-NS	6-158
PT-2496	50EP1041BCXA-NS	6-159
PT-LM-200A	50EN1071BCXA	6-128
PT-LM-200B	50EN1071BCXA	6-129
PT-LM-200C	50EN1071BCXA	6-130
PT-LM-200D	50EN0171BCXA	6-131
PT-2455	10B2496OBXA-NS	6-185
PT-2456	10B2496OBXA-NS	6-186
PT-2457	10B2496OBXA-NS	6-187

7.2.4.1 Modification/Replacement Status

We are presently participating in a transmitter qualification program which is scheduled to be completed by June 1982. We have ordered replacement transmitters of the type being tested (Rosemount Series No. 1153D) to ensure that we will have transmitters available to replace existing types.

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4.2 Modification/Replacement Schedule

Replacement transmitters have been placed on order. Based on current projections for material delivery and our current outage schedule, replacement is scheduled to begin during the last quarter of 1981.

7.2.4.3 Justification For Continued Operation

These transmitters have been environmentally tested and have demonstrated their ability to provide an accident mitigation trip signal when subject to a harsh environment. Therefore, it is concluded that continued operation of the Surry Units in the interim with this equipment will have no effect on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

EQUIPMENT ITEM NO. 5
PRESSURE TRANSMITTER LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-27)
FISCHER AND PORTER MODEL 50EP1041BCXANS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 5
LICENSEE REFERENCE(S): 1584
FUNCTION (PLANT ID): STEAM GENERATOR STEAM PRESSURE (PT-2474 TO -2476, -2484 TO 2486, -2494 TO 2496)
LICENSEE SUBMITTAL: SCEW(S): 6-151 TO -159

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

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

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

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

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

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

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

X Corrective action specified by the Licensee:

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

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

X The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action: 12/31/81.)

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4 Fischer Porter (Transmitters)

PLANT ID NO.	MODEL NO.	WORKSHEET PAGE NO.
FT-2474	10B24960B	6-142
FT-2475	10B24960B	6-142
FT-2484	10B24960B	6-144
FT-2485	10B24960B	6-145
FT-2494	10B24960B	6-146
FT-2495	10B24960B	6-147
FT-FW-200A	10B2496PB-NS	6-87
FT-FW-200B	10B2496PB-NS	6-88
FT-FW-200C	10B2496PB-NS	6-89
PT-2464	50EP1041BCXA-NS	6-148
PT-2466	50EP1041BCXA-NS	6-149
PT-2468	50EP1041BCXA-NS	6-150
PT-2474	50EP1041BCXA-NS	6-151
PT-2475	50EP1041BCXA-NS	6-152
PT-2476	50EP1041BCXA-NS	6-153
PT-2484	50EP1041BCXA-NS	6-154
PT-2484	50EP1041BCXA-NS	6-155
PT-2486	50EP1041BCXA-NS	6-156
PT-2494	50EP1041BCXA-NS	6-157
PT-2495	50EP1041BCXA-NS	6-158
PT-2496	50EP1041BCXA-NS	6-159
PT-LM-200A	50EN1071BCXA	6-128
PT-LM-200B	50EN1071BCXA	6-129
PT-LM-200C	50EN1071BCXA	6-130
PT-LM-200D	50EN0171BCXA	6-131
PT-2455	10B24960BXA-NS	6-185
PT-2456	10B24960BXA-NS	6-186
PT-2457	10B24960BXA-NS	6-187

7.2.4.1 Modification/Replacement Status

We are presently participating in a transmitter qualification program which is scheduled to be completed by June 1982. We have ordered replacement transmitters of the type being tested (Rosemount Series No. 1153D) to ensure that we will have transmitters available to replace existing types.

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4.2 Modification/Replacement Schedule

Replacement transmitters have been placed on order. Based on current projections for material delivery and our current outage schedule, replacement is scheduled to begin during the last quarter of 1981.

7.2.4.3 Justification For Continued Operation

These transmitters have been environmentally tested and have demonstrated their ability to provide an accident mitigation trip signal when subject to a harsh environment. Therefore, it is concluded that continued operation of the Surry Units in the interim with this equipment will have no effect on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

EQUIPMENT ITEM NO. 6
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING (AB-13A (N))
FISCHER AND PORTER MODEL 50EN1071BCXA
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 6
LICENSEE REFERENCE(S): 1584
FUNCTION (PLANT ID): REACTOR CONTAINMENT PRESSURE (PT-LM-200A, B, C, D)
LICENSEE SUBMITTAL: SCEW(S): 6-128 TO -131

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

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

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

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

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

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

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action: 12/31/81.)

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4 Fischer Porter (Transmitters)

PLANT ID NO.	MODEL NO.	WORKSHEET PAGE NO.
FT-2474	10B2496OB	6-142
FT-2475	10B2496OB	6-142
FT-2484	10B2496OB	6-144
FT-2485	10B2496OB	6-145
FT-2494	10B2496OB	6-146
FT-2495	10B2496OB	6-147
FT-FW-200A	10B2496PB-NS	6-87
FT-FW-200B	10B2496PB-NS	6-88
FT-FW-200C	10B2496PB-NS	6-89
PT-2464	50EP1041BCXA-NS	6-148
PT-2466	50EP1041BCXA-NS	6-149
PT-2468	50EP1041BCXA-NS	6-150
PT-2474	50EP1041BCXA-NS	6-151
PT-2475	50EP1041BCXA-NS	6-152
PT-2476	50EP1041BCXA-NS	6-153
PT-2484	50EP1041BCXA-NS	6-154
PT-2484	50EP1041BCXA-NS	6-155
PT-2486	50EP1041BCXA-NS	6-156
PT-2494	50EP1041BCXA-NS	6-157
PT-2495	50EP1041BCXA-NS	6-158
PT-2496	50EP1041BCXA-NS	6-159
PT-LM-200A	50EN1071BCXA	6-128
PT-LM-200B	50EN1071BCXA	6-129
PT-LM-200C	50EN1071BCXA	6-130
PT-LM-200D	50EN0171BCXA	6-131
PT-2455	10B2496OBXA-NS	6-185
PT-2456	10B2496OBXA-NS	6-186
PT-2457	10B2496OBXA-NS	6-187

7.2.4.1 Modification/Replacement Status

We are presently participating in a transmitter qualification program which is scheduled to be completed by June 1982. We have ordered replacement transmitters of the type being tested (Rosemount Series No. 1153D) to ensure that we will have transmitters available to replace existing types.

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4.2 Modification/Replacement Schedule

Replacement transmitters have been placed on order. Based on current projections for material delivery and our current outage schedule, replacement is scheduled to begin during the last quarter of 1981.

7.2.4.3 Justification For Continued Operation

These transmitters have been environmentally tested and have demonstrated their ability to provide an accident mitigation trip signal when subject to a harsh environment. Therefore, it is concluded that continued operation of the Surry Units in the interim with this equipment will have no effect on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

EQUIPMENT ITEM NO. 7
ELECTRICAL PENETRATION LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
AMPHENOL MODEL TYPE III
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 7
LICENSEE REFERENCE(S): 5329, 1167, 5238, 4005, 3190, 74
FUNCTION (PLANT ID): SUPPLIES SERVICE TO SAFETY SYSTEM (NUS-41 S.N. 65/1065)
LICENSEE SUBMITTAL: SCEW(S): 6-46

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

For evaluation, Refer to Item 8

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 7

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

X (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.4 Amphenol (Electrical Containment Penetrations)

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ITEM NO. 8
ELECTRICAL PENETRATION LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
AMPHENOL MODEL TYPE 1C
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 8
LICENSEE REFERENCE(S): 5329, 1167, 5288, 4005, 3190, 74
FUNCTION (PLANT ID): SUPPLIES POWER TO SAFETY SYSTEM (NUS-41 S.N. 65/1065)
LICENSEE SUBMITTAL: SCEW(S): 6-45

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

X (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.4 Amphenol (Electrical Containment Penetrations)

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X ; NUREG-0588, Cat. I___; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	Electrical Penetration	Electrical Pemetration	
Manufacturer's Name (5.2.2/-/-)	Amphenol	Amphenol	
Model Number (5.2.2/-/-)	See pg. 1a	See Page 5F	
Serial Number	Not Stated	Not Applicable	
Features/Mounting (5.2.6/-/-)	Shell of Containment	In autoclave	
Connections/Interfaces (5.2.6/-/-)	Not Stated	Not Applicable	
Location/Elevation	Containment	Not Applicable	
Equipment ID No.	N/A	Not Applicable	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	Various See pg. 1a	Various, See Pg. 1a	
Report Date	Various	Various	
Issued by	Amphenol	Amphenol	
Prepared for	N/A	Davis Besse, Trojan, ANO	
Referenced Reports	N/A	Not Applicable	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	N/A	Test	
QUALIFICATION TEST PROGRAM			
Functional Test Description (5.2.5/2.2.9/2.2.9)	N/A	Maintain Current and Pressure Integity	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.	Vaious	Various	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	N/A	Maintain Electrical and Pressure Integrity	
Accuracy (5.2.5/-/-)	N/A	Not Applicable	
Number of Specimens	N/A	2 to 6	
Test Instruments Calibrated	N/A	Yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Not Stated	Not Stated	
Test Duration (5.2.1/-/-)	N/A	~ 24hrs	X Note 1
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	more than 24 hours	Not Applicable	
Required Function Time	120 days	Not Applicable	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	N/A	See note 2	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)	N/A	Not Applicable	
1. Representative Sample 2. Baseline Data 3. Performance Extremes 4. Thermal Aging 5. Radiation Aging 6. Wear Aging 7. Vibration/Seismic 8. DBE Exposure 9. Post-DBE Exposure 10. Inspection			
Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	Not Stated	Not Stated	X Note 3
Material Aging Evaluation (7.0/-/-)	Not Done	Not Performed	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	Not Stated	Not Stated	
Radiation Aging, Type	Gamma	Gamma	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	3.5×10^4	See Accident Dose	
Radiation Aging, Dose Rate	Not Stated	See Accident Dose	
Radiation Aging, Method	N/A	Test	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	N/A	Stated to be none	
Operational Aging (-/4.2/-)	N/A	Not Stated	
Other Age Conditioning (-/4.2/-)	N/A	Not Stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	< 40 yrs	Not Stated	Y see note 3
Normal Ambient Temperature	Not Stated	Not Applicable	
Normal Ambient Radiation	Not Stated	Not Applicable	
Normal Ambient Humidity	Not Stated	Not Applicable	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	VEPCO Program	Not Applicable	
On-Going Analysis of Failures and Degradation (7.0/-/-)	VEPCO Program	Not Applicable	
Margin (General) (6.0/3.0/3.0)	N/A	Not Applicable	
Margin (NUREG-0588, Cat. I) (-/3.2/-)	N/A	Not Applicable	
1. Temperature (+15°F)			
2. Pressure (+10%, 10 psig max)			
3. Radiation (not required)			
4. Time (+10%, +1 hour + function time minimum)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	LOCA	LOCA	-
Radiation Type	Gamma	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	7.4×10^6	0.122 to 1.03×10^8 Roentgens	X Note 4
Radiation Dose Rate (rd/hr)	Not Stated	Not Stated	
Radiation Qual. Metnod (5.3.1/-/-)	N/A	Test	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	N/A	Not Applicable	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)	Not Stated	Not Applicable	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	7.4×10^6	Not Applicable	
Plateout Dose Considered (-/1.48/1.48)	N/A	Not Applicable	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	N/A	Not Applicable	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase			
Peak: °F/psig/RH/Time	See Pg. 5n	See Pages 5k, 5l and 5m	
Decrease To: °F/psig/RH/Time			
Decrease To: °F/psig/RH/Time			X Note 5
Decrease To: °F/psig/RH/Time			
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)			
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	N/A		
Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8)	Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr; Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	None	X Note 6
Spray Density (gpm/ft^2)			
Spray Duration			
Submergence Duration (4.1.3/2.2.5/2.2.5)			
In-Leakage Considered (5.2.6, 5.3.2/-/-)			
Time to Submergence			
Dust Environment (-/2.2.11/2.2.11)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

Form QDR-1/01/80 Sheet 1
Client ID: Virginia Electric & Power Company QDR-5437-59-01
Plant: Surry Unit 1

Qualification Document Review Checklist

Review for: DOR Guidelines ☒ NUREG-0588 ☐

1. Name of the Reviewer: J. Solano Date: 6/26/81
2. Equipment Covered: Amphenol Electrical Penetration Assemblies
3. Equipment Tag No(s).: Type IA, IB IC, III, IV

		YES	NO	NA	Page Ref.
4.	Does the report address all of the Class 1E equipment in this category listed in the master 1E equipment list?		X		See Attachment #1
*5.	Is the report traceable to the plant equipment?		X		See Attachment #1

ATTACHMENT #1

(1) Question No. 4

NUS evaluated the various materials of the test specimen, listed in Amphenol Report No. 123-1275 and attachment no. 2 to 6, against those types of materials which are used in Amphenol penetrations for Surry Unit 1 & 2 (Amphenol proposal and applicable catalogue) and determined these reports to be adequate in establishing qualification of the following penetrations used in the Surry plant.

Amphenol Instrument	Penetration Type
Control	IA
Power	IB
Triaxial	IC
Thermocouple	III
	IV

Note: Test reports, prepared for Arkansas Power & Light and Davis Besse of Toledo Edison Company, had been used to establish the qualification for Amphenol Electrical Penetrations, used for Surry Power Station, because Amphenol Company supplied Electrical Penetration Assemblies to Arkansas Power & Light and Toledo Edison Company about the same time and the design, construction and materials used could not be any different.

(2) Question No. 5

NUS compared the material configuration of electrical penetrations used in Surry Unit No. 1 (listed in Amphenol proposal and S&W correspondence in Sec. 2) with the various materials of test specimen in the test reports (Report #123-2003, Rev. 1, April 15, 1975, Sec. 5.2.3, pages 17 & 18) and concluded that these reports are adequate in establishing the traceability of the plant penetrations.

It is not clear why the manufacturer was not contacted to determine the applicability of the test reports. It is noted that Amphenol has provided test documentation to other plants i.e. Calvert Cliffs, Trojan, San Onofre Davis Besse and ANO.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

1. The test duration does not envelope the accident duration and the evaluation of the discrepancy, but was provided (arrhenius analysis) has not been technically justified
2. The test report indicates the following sequence.

123-1257
123-1[illegible]
Rev. [illegible]

TABLE VI

TEST SEQUENCE

TEST	MODULE M NO. II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Individual Modules											
Weight & Dimensions	X	X	X	X	X	X	X	X	X	X	X
He Leak Test	X	X	X	X	X	X	X	X	X	X	X
Dielectric	X	X	X	X	X	X	X	X	X	X	X
IR	X	X	X	X	X	X	X	X	X	X	X
Continuity	X	X	X	X	X	X	X	X	X	X	X
Radiation	X	X	X	X	X	X					
Weight & Dimensions	X	X	X	X	X	X					
He Leak Test	X	X	X	X	X	X					
Dielectric	X	X	X	X	X	X					
IR	X	X	X	X	X	X					
Continuity	X	X	X	X	X	X					
Assembled As Complete Penetration											
He Leak Test	X	X	X	X	X	X	X	*	X	X	X
Dielectric	X	X	X	X	X	X	X	X	X	X	X
IR	X	X	X	X	X	X	X	X	X	X	X
Continuity	X	X	X	X	X	X	X	X	X	X	X
Contact Resistance	X	X	X	X	X	X	X		X	X	X
N_2 Over Pressure	X	X	X	X	X	X	X		X	X	X
Environmental	X	X	X	X	X	X	X		X	X	X
IR (During Env.Test)	X	X	X	X	X	X	X		X	X	X
IR(After Env.Test)	X	X	X	X	X	X	X		X	X	X
Dielectric	X	X	X	X	X	X	X		X	X	X
Continuity	X	X	X	X	X	X	X		X	X	X
He Leak Test	X	X		X			X		X	X	X
Short Circuit	X	X		X			X		X	X	X
He Leak Test	X	X		X			X		X	X	X
Dielectric	X	X		X			X		X	X	X
Continuity	X	X		X			X		X	X	X

* Failed He Leak Test - Pits on Sealing Surface Replaced in Assembly with Blank.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

3. Although the penetrations contain materials which are subject to age related degradation (see table II below) no preaging or aging evaluation has been conducted and an analyzed life estimate has been established.

TABLE II

IRRADIATION SAMPLES

ITEM NO.	PART DESCRIPTION	Nominal Elevation from Bottom of Cannister (Inches)	Nominal Radiation Dose Rate (R/Hr x 10^6)	Nominal Total RAD Dose (R x 10^3)(Roentgens)
1	Polyurethane O-ring (on H.B. Molule II	4.94	2.20	1.034
2	Omniseal C-Seal w/spring (on HB Module III))	2.81	2.12	0.996
3	Ethylene Propolene O-ring (on HB Module IV)	7.06	1.94	0.912
4	Molydisulphide C-seal w/o-ring (on HB Module V)	9.19	1.51	0.710
5	Tech seal C-seal w/spring (on HB Module VII	0.69	1.30	0.611
6	Silicone O-ring (Module size)	UNK	0.26	0.122
7	Ethylene Propolene O-ring (Module size)	UNK	0.26	0.122
8	Silicone O-ring(12" Hdr. Plt. size)	17	0.26	0.122
9	Ethylene Propolene O-ring(12" Hdr. Plt. size)	17	0.26	0.122
10	Module Grommet (LOFT 2 5/16"x 1 1/8")	16	0.30	0.141
11	Silicone Rubber Boot	UNK	0.26	0.122
12	AWG # 1/0 Copper Contact	1.5	1.74	0.818
13	Cad Plated Bolt	1.5	1.74	0.818
14	Coax Connector (205-0074)	1.5	1.74	0.818
15	Connector Plate, Blue Diallyl Phthalate	17	0.26	0.122
16	Wire Samples	12.5	0.73	0.913
17	Teflon Tape	UNK	0.26	0.122
18	Astrel Tensile Specimen	6.0	2.10	0.987
19	DC-98011 (Small cup sample)	UNK	0.26	0.122
20	Araldite 6005 epoxy, 9130 hardner with Novacite #1250 Filler	UNK	0.26	0.122
21	Tensile Specimens	6.0	1.94	0.987

*Where actual location of sample in Test cannister was not recorded, "UNK" is indicated and the minimum RAD dose is specified although a considerably higher RAD dose may have been encountered ** (See Table I)

123-1257

123-1252 Rev. N/C

NOTES:

Note 3 (Cont'd) The licensee states

(4) Question No. 9

As per the report 123-1275 the test specimen were subjected to the following 4 - thermal cycles:

1. 300°F for 1 hr; followed by 250°F for 23 hrs
2. 300°F for 1 hr
3. 350°F for 4 hrs
4. 400°F for 1 hr

Even though all the specimen showed no degradation of their physical properties, NUS finds that it is not enough to justify 40 yrs life of electrical penetrations. An ongoing aging program (to be developed by June, 1982) shall be maintained.

Note 4: as can be seen from the information contained in Table II (reproduced on pg 54) most of the parts did not receive the same dose. furthermore the dose was given in roentgens not Rads and the licensee has not converted the dose information

Test Conditions

The test was charged at 10:00 AM, February 4, 1972, and discharged at 9:00 AM, February 6, 1972 for an exposure of 47 hours or 1.03×10^8 R. The thermocouple measuring the ambient air temperature near the maximum flux location within the canister reached 92°F shortly after the irradiation commenced, and remained constant until discharge.

Conversion from Roentgens (R) to rads is a direct one only for soft tissue with a low energy absorption coefficient. To obtain a dose in rads for your material, you would have to arrive at an energy absorption coefficient. I trust this information will satisfy your requirements. Please call upon us if we can be of further assistance. I will look forward to seeing you in early March.

NOTES:

5. Data in the test documentation indicate two test points neither envelope the peak temperature nor envelop the required duration. A third test point which exceeds the temperature profile required does not have adequate duration, and there is no technical basis which would establish the validity of the arrhenius equation & extrapolation of local (steam) condition.

The test profiles are reproduced on page 5K, 5L and 5M. The plant requirement is reproduced on page 5M.

Note 6. Boric acid was injected & boiled to make steam. No spray was used.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

123-2045

TEST DATA ON DAVIS-BESSE
LOW VOLTAGE PENETRATION
ENVIRONMENTAL (LOCA) TESTS

	Steam		N_2 Pressure (EPA)
12-04-74	P(psig)	T(°F)	(psig)
1:20 P.M.	2	68	46
1:50 P.M.	20	121	50
2:05 P.M.	65	223	52
2:10 P.M.	35	212	60
2:30 P.M.	45	249	73
2:40 P.M.	48	258	80
3:00 P.M.	46	255	84
3:30 P.M.	47	254	87
4:00 P.M.	52	255	88
4:30 P.M.	50	259	90
5:00 P.M.	45	254	90
5:30 P.M.	50	254	90
12-05-74			
10:30 A.M.	32	162	63
11:30 A.M.	55	156	68
12:00 Noon	41	160	67
12:30 P.M.	36	155	63
1:30 P.M.	40	146	60
2:00 P.M.	55	140	60
12-06-74			
2:40 P.M.	22	210	45
3:30 P.M.	26	166	47
12-09-74			
9:10 A.M.	28	155	64
9:40 A.M.	42	190	68
2:00 P.M.	19	180	59
5:00 P.M.	20	164	61
12-10-74			
8:30 A.M.	10	192	76
10:30 A.M.	9	190	66
5:00 P.M.	10	189	60

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

123-204

3x35 pen

TESTING OF ARKANSAS
LOW VOLTAGE POWER PENETRATION
ENVIRONMENTAL (LOCA) TESTS

	Steam	
2-10-75	P(psig)	T(°F)
9:45 A.M.	62	125
10:15 A.M.	62	137
10:18 A.M.	60	175
10:20 A.M.	62	203
10:23 A.M.	62	218
10:25 A.M.	63	227
10:30 A.M.	63	234
10:35 A.M.	63	238
10:40 A.M.	63	243
10:45 A.M.	58	242
10:50 A.M.	50	240
11:00 A.M.	21	220
1:15 P.M.	21	209
2:35 P.M.	21	210
4:20 P.M.	21	208
2-11-75		
8:40 A.M.	21	210
9:05 A.M.	21	210
9:50 A.M.	21	208
10:45 A.M.	21	210

NOTES:

TABLE 3

ENVIRONMENTAL TEST DATA

TEST TIME MIN(hr)	REGULATED PRESSURE PSIG	MEASURED TEMP. °F	MEASURED PRESSURE, PSIG CHAMBER	HP#1	HP#2
0	-	87	0	30	30
5	-	125	0	32	32
15	-	125	0	36	36
25	-	125	0	38	38
0	0	125	0	38	38
1/2(0:005)	55	275	40	40	42
1 (0:01)	55	300	58	44	48
5 (0:05)	55	300	58	60	56
15(0:15)	55	300	58	60	56
20(0:20)	20	295	50	60	56
30(0:30)	20	272	30	60	56
75(1:15)	20	255	20	51	58
105(1:45)	20	255	20	20	60
165(2:45)	20	255	19	50	60
225(3:45)	20	255	20	50	60
285 (4:45)	20	255	20	48	60
345 (5:45)	20	256	20	46	60
405 (6:45)	20	255	20	46	60
465 (7:45)	20	255	20	44	62
525 (8:45)	20	255	20	42	62
555 (9:15)	20	255	20	42	62
615 (10:15)	20	255	20	40	62
675 (11:15)	20	255	20	40	62
735 (12:15)	20	255	20	38	62
795 (13:15)	20	255	19	37	62
855(14:15)	20	255	20	36	62
915 (15:15)	20	255	20	35	62
975 (16:15)	20	255	20	34	62
1035 (17:15)	20	255	19	33	62
1095 (18:15)	20	255	19	32	62
1155 (19:15)	20	255	19	32	62
1215 (20:15)	20	255	20	30	61
1275 (21:15)	20	255	20	30	61
1335 (22:15)	20	255	19	29	61
1395 (23:15)	20	256	19	28	61
1440 (24:00)	0	255	20	27	61

(1) PRELIMINARY HEATING TIME

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

NOTES:

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Unit: 1 and 2
Docket#: 50-280 and 50-281

ZONE: PC-3A
DESCRIPTION: Containment Inside Cranewall, Elev. (-)3'6"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Design, 105F Maximum, 125F	15 1	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	NA	
PRESSURE (psia)	9.0-11.1	1	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	NA	
RELATIVE HUMIDITY (%)	NC		100, 0-120 days	2	100, 0-120 days	2	NA	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

EQUIPMENT ITEM NO. 9
ELECTRICAL PENETRATION LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
AMPHENOL MODEL TYPE 1B
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 9
LICENSEE REFERENCE(S): 5329, 1167, 5288, 4005, 3190, 74
FUNCTION (PLANT ID): SUPPLIES POWER TO SAFETY SYSTEMS (NUS-41 S.N. 65/1065)
LICENSEE SUBMITTAL: SCEW(S): 6-44

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

For evaluation, Refer to item 8

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

X (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.4 Amphenol (Electrical Containment Penetrations)

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

EQUIPMENT ITEM NO. 10
ELECTRICAL PENETRATION LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
AMPHENOL MODEL TYPE IA
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 10
LICENSEE REFERENCE(S): 5329, 1167, 5288, 4005, 3190, 74
FUNCTION (PLANT ID): ELECTRICAL CONTINUITY THROUGH CONTAINMENT WALL (NUS-41 S.N. 65/1065)
LICENSEE SUBMITTAL: SCEW(S): 6-43

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

For evaluation, Refer to Item 8

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

X (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.4 Amphenol (Electrical Containment Penetrations)

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

EQUIPMENT ITEM NO. 11
ELECTRICAL PENETRATION LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
CONAX, MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 11
LICENSEE REFERENCE(S): 1049, 51
FUNCTION (PLANT ID): SUPPLIES POWER TO SAFETY SYSTEM (NAS-21 NA-313/1313)
LICENSEE SUBMITTAL: SCEW(S): 6-27 TO -31

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

NOTES:

The Licensee has cited Conax report IPS-179 as evidence of qualification for the Surry Plants. IPS 179 is a compilation of 3 reports for North Anna units 1 and 2 which envelop all of the Surry LOCA parameters except aging. The Test reports were dated in 1974 and it is logical that the testing would apply. The Licensee also cited a report (IPS-601) dated in October 1980 for aging and stated:

ATTACHMENT #1

ADDITIONAL INFORMATION/CLASSIFICATIONS/JUSTIFICATIONS

1. Question No. 4

NUS evaluated the test specimen cited in this test report against the type of penetrations specified for use in Surry Power Plant Units 1 & 2 and determined this report to be adequate in establishing qualification of the following penetrations in the Surry Plant.

1. Conax Low Voltage Power Penetration Type IC & ID
2. Conax Low Voltage Power Penetration Type IIA, IIB, IIC

NOTE: Conax Report IPS 179, prepared for Surry Units 1 and 2 is the compilation of North Anna Reports 73.1, 73.2, and 73.4. It indicates that Conax Company had supplied similar penetrations for both Surry and North Anna Plants. Hence NUS considered all North Anna reports applicable to Surry Plants. Also the same specification (NAS-21) was used for both plants.

2. Question No. 5

NUS compared the configuration and various materials of the test specimen in this report versus the configuration and materials of the Conax LV Penetrations used in the plant and determined that this report is applicable for establishing qualification status of the penetrations, listed in item 1.

It is not obvious to an indpendent reviewer that a 1980 report would be applicable to penetration manufactured in the early 1970's. The licensee should obtain from the manufacturer certification that the report applies or else provide a conservative aging evaluation of the penetrations installed in Surry units 1 and 2.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

EQUIPMENT ITEM NO. 12
FLOW TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-27B)
BARTON MODEL 386
REQUIRED OPERATING TIME: NOT SPECIFIED
TER CHECKSHEET NO. 12
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): COLD LEG SAFETY INJECTION (FT-2961 TO -2963)
LICENSEE SUBMITTAL: SCEW(S): 6-280 TO -282

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

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

Not stated, (Not applicable) New Equipment Item

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

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

Not Applicable — New Equipment Item

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

*New Equipment Item — Review is in progress

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

LICENSEE RESPONSE TO NRC SER

Qualification of Post Accident Monitoring equipment referenced in the Emergency Procedures is a new requirement. Vepco will review the qualification status of this equipment and advise the NRC of the schedule for implementation of any required corrective action by June 30, 1982.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

EQUIPMENT ITEM NO. 13
FLOW TRANSMITTER LOCATED IN THE SAFEGUARD AREA (SFGD-1)
ROSEMOUNT MODEL 1152DP5
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 13
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): LOW HEAD INJECTION HEADER (FT-2945, -2946)
LICENSEE SUBMITTAL: SCEW(S): 6-283, -284

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

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

Not stated, (Not applicable) New Equipment Item

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

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

Not Applicable — New Equipment Item

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

*New Equipment Item — Review is in progress

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

LICENSEE RESPONSE TO NRC SER

Qualification of Post Accident Monitoring equipment referenced in the Emergency Procedures is a new requirement. Vepco will review the qualification status of this equipment and advise the NRC of the schedule for implementation of any required corrective action by June 30, 1982.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

EQUIPMENT ITEM NO. 14
FLOW TRANSMITTER LOCATED IN THE AUXILIARY BUILDING (AB-2B)
FISCHER AND PORTER MODEL 10B2496QBNS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 14
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING FLOW/MINIMUM BORATION (FT-2122)
LICENSEE SUBMITTAL: SCEW(S): 6-11

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.3.8 Flow Control Valve and Flow Transmitter (Chemical and Volume Control)

FCV-2122
FT-2122

These components are not required to mitigate the consequences of an LOCA or MSLB, and are not subjected to an HELB or required to mitigate an HELB.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

SYSTEM CONSIDERATION REVIEW

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

Reason for Concurrence

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

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

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

Reason for Non-Concurrence

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ITEM NO. 15
FLOW TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-47B)
FISCHER AND PORTER MODEL 10B2496PB
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 15
LICENSEE REFERENCE(S): 687
FUNCTION (PLANT ID): AUXILIARY FEEDWATER FLOW (SG1A, B, C) (FT-FW-200A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-87 TO -89

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

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

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

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

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

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

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action: 12/31/81.)

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4 Fischer Porter (Transmitters)

PLANT ID NO.	MODEL NO.	WORKSHEET PAGE NO.
FT-2474	10B2496OB	6-142
FT-2475	10B2496OB	6-142
FT-2484	10B2496OB	6-144
FT-2485	10B2496OB	6-145
FT-2494	10B2496OB	6-146
FT-2495	10B2496OB	6-147
FT-FW-200A	10B2496PB-NS	6-87
FT-FW-200B	10B2496PB-NS	6-88
FT-FW-200C	10B2496PB-NS	6-89
PT-2464	50EP1041BCXA-NS	6-148
PT-2466	50EP1041BCXA-NS	6-149
PT-2468	50EP1041BCXA-NS	6-150
PT-2474	50EP1041BCXA-NS	6-151
PT-2475	50EP1041BCXA-NS	6-152
PT-2476	50EP1041BCXA-NS	6-153
PT-2484	50EP1041BCXA-NS	6-154
PT-2484	50EP1041BCXA-NS	6-155
PT-2486	50EP1041BCXA-NS	6-156
PT-2494	50EP1041BCXA-NS	6-157
PT-2495	50EP1041BCXA-NS	6-158
PT-2496	50EP1041BCXA-NS	6-159
PT-LM-200A	50EN1071BCXA	6-128
PT-LM-200B	50EN1071BCXA	6-129
PT-LM-200C	50EN1071BCXA	6-130
PT-LM-200D	50EN0171BCXA	6-131
PT-2455	10B2496OBXA-NS	6-185
PT-2456	10B2496OBXA-NS	6-186
PT-2457	10B2496OBXA-NS	6-187

7.2.4.1 Modification/Replacement Status

We are presently participating in a transmitter qualification program which is scheduled to be completed by June 1982. We have ordered replacement transmitters of the type being tested (Rosemount Series No. 1153D) to ensure that we will have transmitters available to replace existing types.

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4.2 Modification/Replacement Schedule

Replacement transmitters have been placed on order. Based on current projections for material delivery and our current outage schedule, replacement is scheduled to begin during the last quarter of 1981.

7.2.4.3 Justification For Continued Operation

These transmitters have been environmentally tested and have demonstrated their ability to provide an accident mitigation trip signal when subject to a harsh environment. Therefore, it is concluded that continued operation of the Surry Units in the interim with this equipment will have no effect on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

EQUIPMENT ITEM NO. 16
LEVEL TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ROSEMOUNT MODEL 1153ADP5 XM54854
REQUIRED OPERATING TIME: NOT SPECIFIED
TER CHECKSHEET NO. 16
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): STEAM GENERATOR WIDE RANGE LEVEL (LT-2477, -2787, -2497)
LICENSEE SUBMITTAL: SCEW(S): 6-275 TO -277

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

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

Not stated, (Not applicable) New Equipment Item

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

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

Not Applicable — New Equipment Item

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

* See Note 1, page 5f.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

LICENSEE RESPONSE TO NRC SER

Qualification of Post Accident Monitoring equipment referenced in the Emergency Procedures is a new requirement. Vepco will review the qualification status of this equipment and advise the NRC of the schedule for implementation of any required corrective action by June 30, 1982.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

NOTES:

1. The following is a quote from the H.R. Robinson Unit 2 SER response:

"Qualification testing of Rosemount Model 1153, Series A, per Rosemount Report No. 3788 states that the transmitter is qualified per the requirements of IEEE 323-1971. Missing from this report is the aging parameter not required for IEEE 323-1971 but necessary for complete LOCA qualification. Recent Rosemount testing to qualify a transmitter to meet IEEE 323-1974 requirements has resulted in failure. A combination of thermal aging, irradiation and chemical spray test specification parameters has resulted in failed components. The initial failed element was an O-ring comprised of sulphur cured polyethylene rubber. This allowed steam/chemical spray to affect electronic components. The O-ring mode of failure is attributed to high temperature vs. time necessary for the Arrhenius curve time compression to satisfy aging test requirements."

Due to the fact that the Rosemount 1153 Series A transmitters failed a reasonable test, this equipment item must be considered not qualified. and is assigned to NRC category II.b.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

EQUIPMENT ITEM NO. 17
LEVEL TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL
GEMS MODELS XM54853, XM54854
REQUIRED OPERATING TIME: NOT SPECIFIED
TER CHECKSHEET NO. 17
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT SUMP LEVEL TRANSMITTERS A, B (LT-RS-251A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-271, -272

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

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

Not stated, (Not applicable) New Equipment Item

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

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

Not Applicable — New Equipment Item

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

*New Equipment Item — Review is in progress

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

LICENSEE RESPONSE TO NRC SER

Qualification of Post Accident Monitoring equipment referenced in the Emergency Procedures is a new requirement. Vepco will review the qualification status of this equipment and advise the NRC of the schedule for implementation of any required corrective action by June 30, 1982.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

EQUIPMENT ITEM NO. 18
LEVEL TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
BARTON MODEL 386
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 18
LICENSEE REFERENCE(S): 3836
FUNCTION (PLANT ID): PRESSURIZER LEVEL INDICATION CONTROL AND PROTECTION (LT-2459 TO -2461)
LICENSEE SUBMITTAL: SCEW(S): 6-182 TO -184

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

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

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

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

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

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

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action: 12/31/81.)

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.5 Barton (Level Transmitters)

PLANT ID NO.	WORKSHEET PAGE NO.
LT-2459	6-182
LT-2460	6-183
LT-2461	6-184

7.2.5.1 Modification/Replacement Status

We are presently participating in a transmitter qualification program which is scheduled to be completed by June 1982. We have ordered replacement transmitters of the type being tested (Rosemoung Series No. 1153D) to ensure that we will have transmitters available to replace existing types.

7.2.5.2 Modification/Replacement Schedule

Replacement transmitters have been placed on order. Based on current projections for material delivery and our current outage schedule, replacement is scheduled to start during the last quarter of 1981.

7.2.5.3 Justification For Continued Operation

These transmitters have been environmentally tested and have demonstrated their ability to provide an accident mitigation trip signal when subject to a harsh environment. Therefore, it is concluded that continued operation of the Surry Units in the interim with this equipment will have no effect on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

EQUIPMENT ITEM NO. 19
LEVEL TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B, RC-3B)
ROSEMOUNT MODEL 1153DA4
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 19
LICENSEE REFERENCE(S): 1764
FUNCTION (PLANT ID): STEAM GENERATOR (1, 2, 3) NARROW RANGE LEVEL (LT-2474 TO -2476, -2484 TO 2486, -2494 TO 2496)
LICENSEE SUBMITTAL: SCEW(S): 6-90 TO -98

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

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

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

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

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

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

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action: 12/31/81.)

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.6 Rosemount (Transmitters)

PLANT ID NO.	WORKSHEET PAGE NO.
LT-2474	6-90
LT-2475	6-91
LT-2476	6-92
LT-2484	6-93
LT-2485	6-94
LT-2486	6-95
LT-2494	6-96
LT-2495	6-97
LT-2496	6-98

7.2.6.1 Modification/Replacement Status

We are presently participating in a transmitter qualification program which is scheduled to be completed by June 1982. We have ordered replacement transmitters of the type being tested (Rosemount Series No. 1153D) to ensure that we will have transmitters available to replace existing types.

7.2.6.2 Modification/Replacement Schedule

Replacement transmitters have been placed on order. Based on current projections for material delivery and our current outage schedule, replacement is scheduled to start during the last quarter of 1981.

7.2.6.3 Justification For Continued Operation

These transmitters have been environmentally tested and have demonstrated their ability to provide an accident mitigation trip signal when subject to a harsh environment. Therefore, it is concluded that continued operation of the Surry Units in the interim with this equipment will have no effect on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT ITEM NO. 20
TERMINAL BLOCK LOCATED IN CONTAINMENT (RC-3A)
GENERAL ELECTRIC, MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 20
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION AND CONTROL
LICENSEE SUBMITTAL: SCEW(S): 6-267

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

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

(Not stated), Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

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

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

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

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

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 (qualify or replace)

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.11 Terminal Blocks and Splices

Terminal blocks and splices of several manufacturers have been utilized in safety related circuits for Surry Units 1 and 2. Documentation to support qualification of all types of terminal blocks and splices has not been assembled.

7.1.11.1 Modification/Replacement Status

VEPCO has undertaken a program (special test 104) to verify model and serial numers of all safety-related equipment on the master list. As a result of the special test effort, many of the terminal blocks and splices have been identified. Information we can gather generically on various manufacturers/types of terminal blocks indicate that most of all types of terminal blocks are qualifiable to meet the DOR guidelines.

Upon completion of our review of the information gathered in the field verification program, qualification packages for all types of installed terminal blocks and splices will be assembled. Where documentation deficiencies cannot be corrected in a cost effective manner, the terminal blocks or splices will be replaced by qualified terminal blocks or splices.

As part of the field verification program, all terminal blocks in safety related circuits located inside containment were replaced with qualified Raychem Splices (WCSF-N).

7.1.11.2 Modification/Replacement Schedule

The field inspection of installed terminal blocks and splices will be finalized to provide specific identification of the installed terminal blocks and splices. This inspection will be completed by the first quarter of 1982. Upon completion of this inspection, the data will be reviewed to identify any unqualified terminal blocks and splices. A schedule for replacement of any unqualified terminal blocks or splices will be developed by the end of the second quarter of 1982.

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.11.3 Justification for Continued Operation

The terminal blocks and splices that exist in the plant have been specified and installed in strict accordance with established power industry practices. These terminal blocks and splices have a history of reliability and satisfactory performance under similar opeating conditions.

On the basis of the above, it is reasonable to conclude that these terminal blocks and splices will perform their intended safety function when exposed to harsh environments. Therefore, continued operation of the Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

EQUIPMENT ITEM NO. 21
TERMINAL BLOCK LOCATED IN CONTAINMENT (RC-3A)
BUCHANAN, MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 21
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION AND CONTROL
LICENSEE SUBMITTAL: SCEW(S): 6-269

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

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

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

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

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

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

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

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

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

X Corrective action specified by the Licensee:

___ 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 (qualify in place)

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.11 Terminal Blocks and Splices

Terminal blocks and splices of several manufacturers have been utilized in safety related circuits for Surry Units 1 and 2. Documentation to support qualification of all types of terminal blocks and splices has not been assembled.

7.1.11.1 Modification/Replacement Status

VEPCO has undertaken a program (special test 104) to verify model and serial numers of all safety-related equipment on the master list. As a result of the special test effort, many of the terminal blocks and splices have been identified. Information we can gather generically on various manufacturers/types of terminal blocks indicate that most of all types of terminal blocks are qualifiable to meet the DOR guidelines.

Upon completion of our review of the information gathered in the field verification program, qualification packages for all types of installed terminal blocks and splices will be assembled. Where documentation deficiencies cannot be corrected in a cost effective manner, the terminal blocks or splices will be replaced by qualified terminal blocks or splices.

As part of the field verification program, all terminal blocks in safety related circuits located inside containment were replaced with qualified Raychem Splices (WCSF-N).

7.1.11.2 Modification/Replacement Schedule

The field inspection of installed terminal blocks and splices will be finalized to provide specific identification of the installed terminal blocks and splices. This inspetion will be completed by the first quarter of 1982. Upon completion of this inspection, the data will be reviewed to identify any unqualified terminal blocks and splices. A schedule for replacement of any unqualified terminal blocks or splices will be developed by the end of the second quarter of 1982.

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.11.3 Justification for Continued Operation

The terminal blocks and splices that exist in the plant have been specified and installed in strict accordance with established power industry practices. These terminal blocks and splices have a history of reliability and satisfactory performance under similar opeating conditions.

On the basis of the above, it is reasonable to conclude that these terminal blocks and splices will perform their intended safety function when exposed to harsh environments. Therefore, continued operation of the Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ITEM NO. 22
TERMINAL BLOCK LOCATED IN CONTAINMENT (RC-3A)
BURNDY, MODEL NOT STATED
REQUIRED OPEPATING TIME: 120 DAYS
TER CHECKSHEET NO. 22
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION AND CONTROL
LICENSEE SUBMITTAL: SCEW(S): 6-270

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

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

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

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

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

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

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

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

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

X Corrective action specified by the Licensee:

___ 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 (qualify or replace)

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

X The Licensee (~~nas~~/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
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.11 Terminal Blocks and Splices

Terminal blocks and splices of several manufacturers have been utilized in safety related circuits for Surry Units 1 and 2. Documentation to support qualification of all types of terminal blocks and splices has not been assembled.

7.1.11.1 Modification/Replacement Status

VEPCO has undertaken a program (special test 104) to verify model and serial numers of all safety-related equipment on the master list. As a result of the special test effort, many of the terminal blocks and splices have been identified. Information we can gather generically on various manufacturers/types of terminal blocks indicate that most of all types of terminal blocks are qualifiable to meet the DOR guidelines.

Upon completion of our review of the information gathered in the field verification program, qualification packages for all types of installed terminal blocks and splices will be assembled. Where documentation deficiencies cannot be corrected in a cost effective manner, the terminal blocks or splices will be replaced by qualified terminal blocks or splices.

As part of the field verification program, all terminal blocks in safety related circuits located inside containment were replaced with qualified Raychem Splices (WCSF-N).

7.1.11.2 Modification/Replacement Schedule

The field inspection of installed terminal blocks and splices will be finalized to provide specific identification of the installed terminal blocks and splices. This inspction will be completed by the first quarter of 1982. Upon completion of this inspection, the data will be reviewed to identify any unqualified terminal blocks and splices. A schedule for replacement of any unqualified terminal blocks or splices will be developed by the end of the second quarter of 1982.

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.11.3 Justification for Continued Operation

The terminal blocks and splices that exist in the plant have been specified and installed in strict accordance with established power industry practices. These terminal blocks and splices have a history of reliability and satisfactory performance under similar opeating conditions.

On the basis of the above, it is reasonable to conclude that these terminal blocks and splices will perform their intended safety function when exposed to harsh environments. Therefore, continued operation of the Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ITEM NO. 23
LIMIT SWITCH LOCATED IN CONTAINMENT (RC-3A)
MANUFACTURER AND MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 23
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION AND CONTROL
LICENSEE SUBMITTAL: SCEW(S): 6-266

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

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

(Not stated) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

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

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

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

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

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 (qualify or replace)

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

7.1.10 Limit Switches (Various Manufacturers)

Stem mounted limit switches from various manufacturers have been used on containment isolation valves for Surry Unit 1 and 2. These limit switches do not have sufficient documentation to substantiate qualification. These limit switches provide valve position indication in the control room and in some cases provide a latch-in function to maintain the isolation valve in the closed position.

7.1.10.1 Modification/Replacement Status

Any unqualified limit switches will be replaced with qualified units.

7.1.10.2 Modification/Replacement Schedule

These limit switches were added to the master list subsequent to the February 1980 submittal of Revision 3 of the IE Bulletin 79-01B 90 Day Review. A special test will be performed to verify the manufacturer and model of the installed limit switches. This special test will be completed during a maintenance outage presently scheduled for the first quarter of 1982. At the conclusion of the special test, the data will be reviewed to identify any unqualified limit switches. A schedule for the replacement of any unqualified equipment identified will be developed by the end of the second quarter of 1982.

7.1.10.3 Justification for Continued Operation

The function of providing valve position indication is not required to mitigate the consequences of a LOCA or an MSLB. Failure of the valve position indication inside containment would not mislead the operator, as reliable valve position indication is provided on the redundant containment isolation valve outside the containment. Failure of both isolation valve position indication is not likely.

Also, should a limit switch which provides a latching function fail (contacts short) coincident with the resetting of the Containment Limiting Safeguards (CLS) signal, the valve will move from its accident position to its normal operating position. To avoid this situation, an interim procedure will be developed to de-energize the control circuit for these valves following initiation of containment isolation. Thus, failure of the limit switch will not affect the safety function of the valve.

Based on the above, safe operation of the plant will not be affected until the qualified limit switches are installed.

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.11.3 Justification for Continued Operation

The terminal blocks and splices that exist in the plant have been specified and installed in strict accordance with established power industry practices. These terminal blocks and splices have a history of reliability and satisfactory performance under similar opeating conditions.

On the basis of the above, it is reasonable to conclude that these terminal blocks and splices will perform their intended safety function when exposed to harsh environments. Therefore, continued operation of the Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

EQUIPMENT ITEM NO. 24
TEMPERATURE ELEMENT LOCATED IN CONTAINMENT, INSIDE CRANEWALL
ROSEMOUNT MODEL 176KS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 24
LICENSEE REFERENCE(S): 687
FUNCTION (PLANT ID): REACTOR COOLANT SYSTEM TEMPERATURE ELEMENT COLD LEG LOOPS 1, 2, 3 (TE-2410, -2420, -2430)
LICENSEE SUBMITTAL: SCEW(S): 6-188, -192, -196
FUNCTION (PLANT ID): DELTA T/TAVG PROTECTION SYSTEM LOOPS 1, 2, 3/POST-ACCIDENT MONITORING OF LOOP TEMPERATURE (TE-2412B, D; -2422B, D; -2432B, D)
LICENSEE SUBMITTAL: SCEW(S): 6-189, -190, -193, -194, -197, -198
FUNCTION (PLANT ID): REACTOR COOLANT SYSTEM TEMPERATURE ELEMENT HOT LEG LOOPS 1, 2, 3 (TE-2413, -2423, -2433)
LICENSEE SUBMITTAL: SCEW(S): 6-191, -195, -199

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

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

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

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

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

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

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

X Corrective action specified by the Licensee:

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

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

X The Licensee (~~nas~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action will be provided by 12/31/82.)

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.9 RTD's, Rosemount (RCS Wide Range Temperature Elements)

Plant ID No.	Worksheet Page No.
TE-2410	6-188
TE-2412B	6-189
TE-2412D	6-190
TE-2413	6-191
TE-2420	6-192
TE-2422B	6-193
TE-2422D	6-194
TE-2423	6-195
TE-2430	6-196
TE-2432B	6-197
TE-2432D	6-198
TE-2433	6-199

7.1.9.1 Modification/Replacement Status

There are presently no qualified RTD's, although several vendors are attempting to qualify this equipment.

7.1.9.2 Modification/Replacement Schedule

Qualified replacements for the existing RTD's are being investigated. A schedule for replacement will be provided in the second half of 1982.

7.1.9.3 Justification for Continued Operation

The existing RTD's have been in service in the plant environment and functioned satisfactorily thus far. Further, Westinghouse has completed some DBA testing on similar RTD's for North Anna units (ref. WCAP-9157) which demonstrates their capability to function when exposed to harsh environments. Through periodic maintenance testing, and cross checking of the redundant indicating instruments, proper operation of these RTD's can be verified. Also, the RTD's are only required to function to initiate a trip signal and are not required to function during the long term.

On the basis of the above it is concluded that continued operation of the plant in the interim will have no effect on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

EQUIPMENT ITEM NO. 25
ELECTRIC MOTOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
WESTINGHOUSE MODEL PC090W0L
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 25
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHILLED WATER CHILLER (1-VS-E-4A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-114 TO -116

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.4.2 Chiller - Control Room Habitability

PLANT ID NO.	WORKSHEET NO.
1-VS-P-1A	6-117
1-VS-P-1B	6-118
1-VS-P-1C	6-119
1-VS-E-4A	6-114
1-VS-E-4B	6-115
1-VS-E-4C	6-116
1-VS-P-2A	6-120
1-VS-P-2B	6-121
1-VS-P-2C	6-122
MOV-PG-107A	6-84
MOV-PG-107B	6-85
MOV-PG-107C	6-86

The control room habitability equipment located in Unit No. 1 Service Building Machinary room can provide the function. This can be accomplished by opening manual cross-connect valves in the chilled water supply and return headers. These valves are located in the cable spreading area and are accessible from the control room without being exposed to the turbine building environment.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

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)

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

Reason for Non-Concurrence

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

Reason for Concurrence

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

X Other (see page 4b)

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

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

Reason for Non-Concurrence

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

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

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

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

___ Other (see page___)

LICENSEE STATEMENT

See page ~~3a~~ 3b of this checksheet.

EVALUATION OF LICENSEE STATEMENT

On the SCEW the licensee has stated that this equipment is located in the Mechanical Equipment room #3 which is a harsh environment. The licensee has stated on page 3b that this equipment does not require qualification because backup equipment is available to perform the safety function and this backup equipment is located in the cable spreading area which is a mild environment. In addition to this, the backup equipment is manually operated. In light of the above information, it is concluded that this equipment is exempt from the qualification review.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

EQUIPMENT ITEM NO. 26
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING VENTILATION (AB-45)
RCS INC. TYPE BL
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 26
LICENSEE REFERENCE(S): 29
FUNCTION (PLANT ID): DAMPER FOR CHARCOAL FILTRATION SYSTEM (DAMPER 3A, B (2))
LICENSEE SUBMITTAL: SCEW(S): 6-112, -113

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

NOTES:

1. The licensee has deleted this equipment from the master list, but has not provided any reason for this action nor has any qualification documentation been supplied.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT ITEM NO. 27
HYDROGEN RECOMBINER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-47B)
WESTINGHOUSE MODEL A
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 27
LICENSEE REFERENCE(S): 1571 TO 1578, 39, 40
FUNCTION (PLANT ID): H2 RECOMBINER (2-GW-HC-2A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-105, -106

DESIGNATION 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,
2-GW-HC-2A only
Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.6 Westinghouse Electric Corporation

a. H2 Recombiner Units

Plant ID No.	Worksheet Page No.
2-GW-HC-2A	6-105
2-GW-HC-2B	6-106

The qualification data presented by Westinghouse qualifies the recombiner units for in-containment use. Additional information from Westinghouse is being obtained to justify 120-day operability in a post-LOCA environment.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

EQUIPMENT ITEM NO. 28
HYDROGEN ANALYZER LOCATED IN THE AUXILIARY BUILDING, ELEV. 13'0" (AB-13A)(N)
BENDIX MODEL THERMATRON T3
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 28
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): RADIOACTIVE WASTE GAS (2-GW-H2A-203)
LICENSEE SUBMITTAL: SCEW(S): 6-107

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

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

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

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

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

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

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action: 9/30/81.)

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.3 Mine Safety Appliance Company (Hydrogen Analyzer)

PLANT ID NO.	MODEL NO.	WORKSHEET PAGE NO.
2-GW-H2A-103	T-3	6-107

7.2.3.1 Modification/Replacement Status

We will replace the Mine Safety Appliance Co. Analyzers with new Comsip/Delphi, Model KIII analyzers. This equipment was purchased under the TMI Lessons-Learned Modifications to IEEE 323, 1974 qualification requirements. Vendor qualification testing and review is complete, and the equipment is determined to be qualified.

7.2.3.2 Modification/Replacement Schedule

Based upon current projections for material delivery and the present outage schedule, replacements are scheduled to start during the third quarter of 1981.

7.2.3.3 Justification For Continued Operation

This analyzer does not provide an accident mitigation function and is used for post-accident monitoring. In order to provide this function now, a temporary hydrogen grab sample system is available at the station as an interim method for analysis.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EQUIPMENT ITEM NO. 29
I AND C PANEL LOCATED IN THE AUXILIARY BUILDING CABLE VAULT (AB-13B)
WESTINGHOUSE MODEL A
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 29
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SUPPLY POWER H2 RECOMBINER UNITS
LICENSEE SUBMITTAL: SCEW(S): 6-108, -109

DESIGNATION 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, (QT) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

Mild Environment Item

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.3.13 H2 Recombiner Power Supply

This equipment is not located in a harsh environment and therefore the component evaluation sheet has been deleted.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

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)

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.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ITEM NO. 30
ELECTRICAL THERMOCOUPLE CABLE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
AMPHENOL MODEL TYPE IV
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 30
LICENSEE REFERENCE(S): 5329, 1167, 5288, 4005, 3190, 74
FUNCTION (PLANT ID): SUPPLIES POWER TO SAFETY SYSTEM (NUS-41 SN-65/1065)
LICENSEE SUBMITTAL: SCEW(S): 6-47

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3a

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

X (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

NOTES:

The Licensee referenced

R. J. Crowell
Environmental Test Report: Hermetic Feed Through Connector Type 1A, 19/C-No. 16 AWG and Mating Plugs Used on Electrical Penetrations at the Surry Power Station
D. G. O'Brien, 28-Feb-72
C19QA061

and test report on amphenol penetrations However the reports contains no description of either thermocouples or cables.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

EQUIPMENT ITEM NO. 31
FLOW CONTROLLER LOCATED IN THE AUXILIARY BUILDING (AB-2B)
FISCHER AND PORTER MODEL 546
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 31
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING FLOW CONTROL/MINIMUM BORATION (FCV-2122)
LICENSEE SUBMITTAL: SCEW(S): 6-10

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO RE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

SYSTEM CONSIDERATION REVIEW

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

Reason for Concurrence

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

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

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

Reason for Non-Concurrence

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ITEM NO. 32
ELECTRICAL CABLE LOCATED OUTSIDE CONTAINMENT (AB-27)
KAISER MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 32
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): 5000V POWER CABLE (NUS-217 SN-250)
LICENSEE SUBMITTAL: SCEW(S): 6-60C

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.3.11 Kaiser Aluminum and Chemical Sales Inc. (Spec. Nos. NUS 225, NUS 365A, and NUS 217

Based on field test verification (special test 104) obtained subsequent to the February 1980 submittal, it was established that these cables have not been used in safety related applications in Surry Unit No. 1. Therefore, this has been deleted from the Master List.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

SYSTEM CONSIDERATION REVIEW

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

Reason for Concurrence

- [X] Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)
- [ ] Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)
- [ ] Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

- [ ] Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.
- [ ] Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.
- [ ] Backup (equipment/system) is subject to a potentially disabling single active failure.
- [ ] Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.
- [ ] Failure of the primary equipment can result in erroneous indication which could mislead an operator.
- [ ] Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

EQUIPMENT ITEM NO. 33
ELECTRICAL CABLE LOCATED OUTSIDE CONTAINMENT (AB-27)
OKONITE MODEL EPR/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 33
LICENSEE REFERENCE(S): 2103, 72, 73, 95
FUNCTION (PLANT ID): 5000V POWER CAELE (NUS-364A SN-1443)
LICENSEE SUBMITTAL: SCEW(S): 6-60B

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

5) Okonite Company

(a) Type, cross linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

(b) Type, cross linked polyethylene with aluminum armor.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

(c) Type, cross linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; NUREG-0588, Cat. I ___; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	Electrical Cable	Electrical Cable	
Manufacturer's Name (5.2.2/-/-)	Okonite	Okonite Company	
Model Number (5.2.2/-/-)	see p 5 f g	See page 5a (Note A)	
Serial Number	N/A	Not Applicable	
Features/Mounting (5.2.6/-/-)	N/A	Not Applicable	
Connections/Interfaces (5.2.6/-/-)	Not Stated	Cable Splice (Note A)	
Location/Elevation	Containment	Not Applicable	
Equipment ID No.	N/A	Not Applicable	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	ER 141	E.R.141/NQKN1	
Report Date	2/29/72	February 29,1972	
Issued by	Okonite	Okonite	
Prepared for	Okonite	Okonite	
Referenced Reports	F-C3094 FC 3171	F-C3094/F-C3171	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	N/A	Test	
QUALIFICATION TEST PROGRAM			
Functional Test Description (5.2.5/2.2.9/2.2.9)		Maintain electrical Loading @ rated Voltage, Insulation Resistance & Hypot	
Operating Conditions (-/2.2.10/2.2.10)			
Load/Cycles/Voltage/ Current/Freq.		Not Applicable	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	not stated	Not Stated	
Accuracy (5.2.5/-/-)	N/A	Not Applicable	
Number of Specimens	N/A	6	
Test Instruments Calibrated	N/A	Yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Not stated	Not Applicable	
Test Duration (5.2.1/-/-)	NA	100+ days	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	≥ 1 4 hr	Not Applicable	
Required Function Time	120 days	Not Applicable	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	N/A	Thermal Aging Irradiation LOCA (PWR Conditions) LOCA (BWR Conditions)	
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		Not Applicable	
Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	arrhenius extrapolation	168 hrs @ 121°C Basis Not Stated	
Material Aging Evaluation (7.0/-/-)		Not Stated	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		Not Stated	
Radiation Aging, Type	Gamma	Gamma	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	1.24×10^8	See Accident Dose	
Radiation Aging, Dose Rate	Not Stated	See Accident Dose	
Radiation Aging, Method		Test	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)		Not Stated	
Operational Aging (-/4.2/-)		Not Applicable	
Other Age Conditioning (-/4.2/-)		Not Stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	40 years	Not Stated	
Normal Ambient Temperature	Not Stated	Not Applicable	
Normal Ambient Radiation		Not Applicable	
Normal Ambient Humidity		Not Applicable	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	Survey Program	Not Applicable	
On-Going Analysis of Failures and Degradation (7.0/-/-)		Not Applicable	
Margin (General) (6.0/3.0/3.0)	N/A	Not Applicable	
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)		Not Applicable	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

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/ MSLB	LOCA	
Radiation Type	Gamma	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	6.8×10^2	2×10^8	
Radiation Dose Rate (rd/hr)	Not Stated	300,000 rd/hr	
Radiation Qual. Method (5.3.1/-/-)	N/A	Test	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	↓	Not Applicable	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)		Not Stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	1.26×10^8	Not Applicable	
Plateout Dose Considered (-/1.48/1.48)	NA	Not Applicable	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	↓	Not Applicable	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS	HELB ENVIRONMENT		
Rate of Temp./Press. Increase	120-205F, 0- 30 secs	25°F, 8Psi/ second	
Peak: °F/psig/RH/Time	205F, 30-40 secs	324/80/100/3.3 hrs	
Decrease To: °F/psig/RH/Time	205-190F, 40-1000 secs	252/16/100/7 days	
Decrease To: °F/psig/RH/Time	190-145F, 1000-2000 secs	345/104/100/4 hrs	
Decrease To: °F/psig/RH/Time	145-120F, 2000 secs-1 hr	320/75/100/4.5 hrs 256/15/100/20 hrs 272/25/100/3.5 hrs	
		212/0/100/100 days	
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	15.2, 0-1 min 14.9, 1-60 min N/A	Not Stated	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	None	Test	
Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8)	None	10000 ppm Boric Acid buffered with NaOH to a pH of 10.5	
Spray Density (gpm/ft^2)		0.15	
Spray Duration		7 days	
Submergence Duration (4.1.3/2.2.5/2.2.5)		Not Stated	
In-Leakage Considered (5.2.6, 5.3.2/-/-)		Not Applicable	
Time to Submergence		Not Applicable	
Dust Environment (-/2.2.11/2.2.11)		Not Applicable	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

NOTES:

The licensee provided the following information:

6

THE OKONITE COMPANY

Post Office Box 340
Ramsey, New Jersey 07446
201-825-0300/Cable Okonite

December 17, 1900

Ref. 64

Mr. J. H. Barnhart
Principal Electrical Engineer
Stone & Webster Engineering Corporation
Post Office Box 2325
Boston, Massachusetts 02107

Dear Mr. Barnhart: Reference: J. O. No. 12046.44

Environmental Qualification of Equipment
Surry Power Station - Units 1 and 2

In response to your letter of December 10, 1900, we offer the following.

Our records indicate that the 1000 volt control cable PO # SN-440/1440 were insulated with Okonite insulation with a thickness of 30 mils - the singles were Okolon jacketed and the overall jacket was Chloprene. Consequently report NCRN-1 previously submitted covers the Okonite insulation qualification and is applicable.

The 5 kV cable of S&W PO #1443 was insulated with Okoguard insulation. Engineering Report No. 141 submitted in relation to work on the North Anna station. This report is directly applicable to the 5 kV cable of PO #1443. Engineering Report No. 141 is also applicable to the 600 volt cables referenced above.

Very truly yours,

THE OKONITE COMPANY

J. S. Lasky, Vice President
Research and Engineering

JSL/row

NOTES:

To NRK GAEG
EXT 373

THE OKONITE COMPANY

NUS

Post Office Box 340
Ramsey, New Jersey 0744
201-825-0300/Cable: Okonite

December 22, 1980

Ref. 68

Mr. J. M. Barnhart
Principal Electrical Engineer
Stone & Webster Engineering Corporation
Post Office Box 2325
Boston, Massachusetts 02107

Dear Mr. Barnhart: Re: J.O. No. 12846.44

In response to your letter of December 17, 1980 and phone conversation with Mr. Ivor MacFarlane of Stone & Webster on December 19, 1980, we offer the following:

(1) I have signed and dated with today's date the copy of Report NQRN-1 you sent and it is enclosed.

(2) The work of NQRN-1 was performed at our Passaic Research and Engineering Laboratories, Passaic, New Jersey and completed in August 1977. Radiation was performed as indicated in the report in Appendix 1.

(3) In terms of an audit, we can accommodate you on this if you give us two weeks notice. I understand you wish to audit the calibration of equipment reports only.

(4) Appendix 3 of NQRN-1 is enclosed.

(5) The facilities used for the work of Engineering Report No. 141 were the Franklin Institute Research Laboratories. A list of equipment from FIRL Report F-C 3171 is enclosed.

(6) FIRL report C-3694 list of equipment is enclosed.

(7) If the information given in your letter of December 17, 1980 that the cables referenced in paragraph 1a and 1b via Okonite Factory Order numbers all have a minimum of 30 mils of Okonite EP insulation is correct, then the referenced cables are covered by the information of NQRN-1. The Okonite insulation covered by report NQRN-1 is only slightly modified from that supplied to the Surry Power Station and the North Anna Power Station 1 and 2.

NOTES: 4.

CABLE SAMPLES TESTED:

One sample of each of the following types of cable and splice was tested. The samples were designated as shown in Table I.

Table I

Sample No.	Cable Designation
A-4	1/C #14 0.030" Okonite, 0.015" Okoprene
D-4	4/C #14 0.030" Okonite, 0.015" Okoprene, 0.045" Okoprene
E-4	7/C #14 0.030" Okonite, 0.015" Okoprene, 0.045" Okoprene
B-4	1/C 4/0 0.055" Okonite, 0.045" Okoprene
F-4	4/C #12 0.047" Okonite, 0.015" Okolon, 0.045" Okolon
C-4	1/C 4/0 0.140" Okoguard, 0.065" Okolon with T-95 splice and T-35 jacketing tape

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

EQUIPMENT ITEM NO. 34
ELECTRICAL CABLE LOCATED OUTSIDE CONTAINMENT
COLLYER INSULATED WIRE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 34
LICENSEE REFERENCE(S): 4019, 91
FUNCTION (PLANT ID): 5000V POWER CABLE (NUS-364 SN-1250)
LICENSEE SUBMITTAL: SCEW(S): 6-60A

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

1) Collyer Insulated Wire Company type, cross-linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

NOTES:

The licensee documentation has not established qualification of the installed 5000V Collyer cable. In particular there is no technical basis for utilizing a test report on 600V cable which does not identify any construction and material similar to the installed 5000V cable. The tested cables are:

Cable samples and insulation materials are presented below. Samples 1 to 8 were measured prior to testing and were all twenty feet six inches long.

Prior to Irradiation & Testing

FIRL Sample No.	Collyer Number	
1	XP-71-30-1	(7 cond.)
2	XP-71-30-2	(" ")
3	XP-71-30-3	(" ")
4	XP-71-30-4	(" ")
5	XP-71-30-5	(" ")
6	XP-71-30-6	(" ")
7	XP-71-30-7	(" ")
8	XP-71-30-8	(" ")
9	Orange Glass Braid XP-71-30-2 12 Str. 7W .045" Wall methyl phenyl vinyl silicone; 10% phenyl	
10	Orange Glass Braid XP-71-30-3 12 Str. 7W .045" Wall methyl phenyl vinyl silicone; 5% phenyl	
11	Orange Glass Braid XP-71-30-1 12 Str. 7W .045" Wall methyl vinyl silicone	
12	XP-71-30-6 .030" wall methyl vinyl silicone	

Prior to Irradiation & Testing (Cont'd.)

FIRL Sample No.	Collyer Number
13	10' XP-71-30-5,7 XLP-FR (no printing on surface)
14	10' XP-71-30-5,7 XLP-FR (with "6 BLUE" on surface)
15	20" XP-71-30-5,7 XLP-FR (no printing on surface)
16	5' XP-71-30-5,7 XLP-FR (no printing on surface)
17	10' XP-71-30-5,7 XLP-FR (with "2-WHITE" on surface)
18	10' XP-71-30-5,7 XLP-FR (with "4 GREEN" on surface)
19	10' XP-71-30-5,7 XLP-FR (with "5 ORANGE" on surface)
20	10' XP-71-30-5,7 XLP-FR (with "7 WHITE-BLACK" on surface)
21	10' XP-71-30-5,7 XLP-FR (with "1 - BLACK" on surface)
22	10' XP-71-30-5,7 XLP-FR (with "3 RED" on surface)
23	10' XP-71-30-4,8 EPR/HYPALON (with "6 BLUE" on jacket)
24	10' XP-71-30-4,8 EPR/HYPALON (with "7 WHITE-BLACK" on jacket)
25	10' XP-71-30-4,8 EPR/HYPALON (with "2-WHITE" on jacket)

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

NOTES:

Prior to Irradiation & Testing (Cont'd.)

FIRL Sample No.	Collyer Number
26	10' XP-71-30-4,8 EPR/HYPALON (with "3-RED" on jacket)
27	10' XP-71-30-4,8 EPR/HYPALON (with "5-ORANGE" on jacket)
28	10' XP-71-30-4,8 EPR/HYPALON (with plain black jacket)
29	10' XP-71-30-4,8 EPR/HYPALON (with "1 BLACK" on jacket)
30	10' XP-71-30-4,8 EPR/HYPALON (with "4 GREEN" on jacket)
31	5' XP-71-30-4,8 EPR/HYPALON (with plain black jacket)
32	20' XP-71-30-4,8 EPR/HYPALON (with plain black jacket)
33 (no tag)	6 dumbells SE - 9025AH (rust) (one loop of wire)
34 (no tag)	6 dumbells E4FR (two loops of wire) (white)
35 (no tag)	6 dumbells SE-9026A (three loops of wire) (brown)
36 (no tag)	6 dumbells SI-5527A (four loops of wire) (gray)
37 (no tag)	6 dumbells SE-9025A (No loops of wire) (rust)

The Licensee's Qualification package stated:

Form QDR-3/01/80 Sheet 1
Client ID: Virginia Electric & Power Company QDR-5437-46-01
Plant: Surry Unit 1

Qualification Document Review Checklist

Review for: DOR Guidelines [X] NUREG-0588 [ ]

1. Name of the Reviewer: C. J. Endlich Date: 7/28/81
2. Equipment Covered: 5000V Power Cable, XLPE Insulation, Neoprene Jacket (Collyer Co.)
3. Equipment Tag No(s).: N/A See Spec. No. NUS-364

		YES	NO	NA	Page Ref.
4.	Does the report address all of the Class IE equipment in this category listed in the master IE equipment list?		X		See Attachment 1
*5.	Is the report traceable to the plant equipment?		X		See Attachment 1

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

NOTES:

ATTACHMENT #1

Additional Information/Classifications/Justifications

3) Question No. 4

NUS evaluated the test specimen cited in this report against those types of cable used in the Surry Power Plant Unit 1 and determined this report to be adequate in establishing qualification of the following 600 V power cable with XLPE insulation and neoprene jacket used in the Surry Plants:

1) 3/C 750 MCM, insulation thickness .130
2) 3/C 500 MCM, insulation thickness .120
3) 1/C 500 MCM, insulation thickness .120, jacket thickness .080, triplexed
4) 3/C #2, insulation thickness .110
5) 1/C #2, insulation thickness .110 jacket thickness .060, triplexed
6) 3/C #1, insulation thickness .110

2) Question No. 5

NUS compared the insulation systems of the test specimen no. 5 in the test report versus the insulation system of the cables specified for use in the plant and determined that this test report is applicable for establishing qualification status of the cable cited in item 1, above.

4. Additional Comments/Recommendations

1) The qualification report was prepared for 600V XLPE insulated cables and is used to qualify subject 5000V cables because the only difference between two types is the insulation thickness while the material (XLPE) is generically the same. According to IE Bulletin No. 79-01B, Jan. 14, 1980, Enclosure 4, Para. 5.2.2, the type test should only be considered valid for equipment identical in design and material construction to the test specimen. Therefore NUS considers the qualification report applicable.

Since the test report does not provide any description of the tested cables other than the descriptions reproduced on pages 5a and 5b, the statements reproduced from the qualification documentation (reproduced above) cannot be verified in this review. If the licensee has obtained other descriptions from the manufacturer they should have been provided as part of the qualification package.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

NOTES:

Requirements for establishing similarity between installed and tested cables are contained in the DOR Guidelines and IEEE 383-74 which are reproduced below for convenience.

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

[DOR]

IEEE-383

1.3.1 *Cable Description.* This description or specification should include as a minimum:

1.3.1.1 Conductor — material identification, size, stranding, coating.

1.3.1.2 Insulation — material identification, thickness, method of application.

1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders.

1.3.1.4 Shielding — tapes, extrusions, braids, or others.

1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application.

1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable.

1.3.1.7 Identification — manufacturer's trade name, catalog number.

1.3.2 *Field Splice or Connection Description or Both.* This description or specification should include as a minimum:

1.3.2.1 Whether factory or field assembled to cable.

1.3.2.2 Conductor connection — type, material identification, and method of assembly.

1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

NOTES:

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual components) or Single conductor power cable	temperature and moisture resistance	2.3.1	1/C – 14 or 12 AWG
	thermal and radiation exposure	2.3.3	1/C or M/C – 14 or 12 AWG
	design basis event simulation	2.4	1/C or M/C – 14 or 12 AWG 1/C – 6, 4 or 2 AWG
	vertical flame test singles from cable assembly	2.5.6	1/C – 14 or 12 AWG
	vertical tray flame test	2.5.4	7/C – 16, 14 or 12 AWG
Shielded pairs, triple or quad from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test	2.5.6	
Coaxial, triaxial or special instrument cable	temperature and moisture resistance	2.3.1	actual size
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test singles from cable assembly	2.5.6	
Single pair thermocouple extension cable	temperature and moisture resistance	2.3.1	2/C – 20 AWG or actual size if smaller
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical tray flame test	2.5.4	
	vertical flame test singles from cable assembly	2.5.6	
2001–15 000 V power cable 1/C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5kV) 2/O or 4/O or 4/O (2-15kV)

In Lieu of the detailed description discussed above it would be acceptable for the licensee to obtain certification from the manufacturer identifying what test report(s) apply to the cables furnished for installation, providing such report(s) contain adequate information to prove qualification

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

EQUIPMENT ITEM NO. 35
ELECTRICAL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL
CONTINENTAL WIRE MODEL SILICON RUBBER
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 35
LICENSEE REFERENCE(S): 1218
FUNCTION (PLANT ID): SUPPLY POWER TO SAFETY SYSTEM (NUS-326 P.O. NO. 330)
LICENSEE SUBMITTAL: SCEW(S): 6-60

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

LICENSEE RESPONSE TO NRC S[illegible]

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

4) Continental Wire and Cable Co.

(a) Type, high temperature silicone rubber cable.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification document has been or will be assembled and available in the central file.

(b) Type, cross-linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

(c) Type, cross-linked polyethylene with hypalon jacket.

All deficiencies identifed in VEPCO's November, 1980 sumbmittal, and the NRC's SEP Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; NUREG-0588, Cat. I ___; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	Electric Cable	Electrical Cable	
Manufacturer's Name (5.2.2/-/-)	Continental	Continental Wire and Cable Company	
Model Number (5.2.2/-/-)	CC 2115	CC-2115 Silicone Rubber Insulation	
Serial Number	N/A	Not Applicable	
Features/Mounting (5.2.6/-/-)	N/A	See Note 1 on Page 5i	
Connections/Interfaces (5.2.6/-/-)	Not stated	Not Stated	
Location/Elevation	Containment	Not Applicable	
Equipment ID No.	N/A	Not Applicable	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	F-C2935	F-C2935	
Report Date	10/70	October 1970	
Issued by	FIRL	Franklin Institute Research Laboratories	
Prepared for	Continental	Continental Wire and Cable Company	
Referenced Reports	N/A	None	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	Test	Test	
QUALIFICATION TEST PROGRAM			
Functional Test Description (5.2.5/2.2.9/2.2.9)	N/A	600V/12 A....600V/14A	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.	↓	Same as Functional Test	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	N/A	Not Stated	
Accuracy (5.2.5/-/-)		Not Applicable	
Number of Specimens		2	
Test Instruments Calibrated		Yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)		Not Applicable	
Test Duration (5.2.1/-/-)		32 Hours	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	<48 hrs	Not Applicable	
Required Function Time	120 days	Not Applicable	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	N/A	Irradiation Temperature/Humidity Test LOCA Simulation Megger and Dielectric Test	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)			
1. Representative Sample			
2. Baseline Data			
3. Performance Extremes			
4. Thermal Aging			
5. Radiation Aging			
6. Wear Aging			
7. Vibration/Seismic			
8. DBE Exposure			
9. Post-DBE Exposure			
10. Inspection			
Aging (5.2.4, 7.0/4.0/4.0)			
Thermal Aging/Basis	ambient analysis	151°F, 100%RH/ 6hours	
Material Aging Evaluation (7.0/-/-)		Not Stated	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		Not Stated	
Radiation Aging, Type		Not Stated	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	1.3×10^7 rd	Not Stated	
Radiation Aging, Dose Rate	Not Stated	Not Stated	
Radiation Aging, Method		Not Stated	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)		Not Stated	
Operational Aging (-/4.2/-)		Not Stated	
Other Age Conditioning (-/4.2/-)	Not Stated	See Thermal Aging P-5b	
Qualified Life Claimed/ Established (5.2.4/4.10/-)		Not Stated/Not Evaluated	
Normal Ambient Temperature		Not Applicable	
Normal Ambient Radiation		Not Applicable	
Normal Ambient Humidity		Not Applicable	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	Survey Program	Not Applicable	
On-Going Analysis of Failures and Degradation (7.0/-/-)		Not Applicable	
Margin (General) (6.0/3.0/3.0)	Not Stated	Not Stated	
Margin (NUREG-0588, Cat. I) (-/3.2/-)		Not Applicable	
1. Temperature (+15°F)			
2. Pressure (+10%, 10 psig max)			
3. Radiation (not required)			
4. Time (+10%, +1 hour + function time minimum)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

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 (Limiting Condition)	
Radiation Type	Gamma	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	2.4×10^7	10 Megarads	X
Radiation Dose Rate (rd/hr)	Not Stated	0.45 Megarads / Hour	
Radiation Qual. Method (5.3.1/-/-)		Test	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	N/A	Not Applicable	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)		Not Stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	3.7×10^7	Not Applicable	X
Plateout Dose Considered (-/1.48/1.48)		Not Stated	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)		Not Stated	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase		15.75°F; 8.33Psi/second	
Peak: °F/psig/RH/Time	280/[illegible]/[illegible]/30m	340/ 100 / 100% / 2 hours	
Decrease To: °F/psig/RH/Time	280-150/44/[illegible]	340-160/ 100-0/100%/4 hrs	
Decrease To: °F/psig/RH/Time	150/20-2/[illegible]	160 / 0 / 100% / 20 hours	
Decrease To: °F/psig/RH/Time	120/-2/[illegible]		
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	N/A	Not Applicable	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)		Not Stated	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	2000-2200 ppm H_3BO_3 + NaOH pH 8.5-11	Not Stated	X
Spray Density (gpm/ft^2)	Not stated	Not Stated	X
Spray Duration	4 hrs	Not Stated	
Submergence Duration (4.1.3/2.2.5/2.2.5)	NR	Not Stated	
In-Leakage Considered (5.2.6, 5.3.2/-/-)		Not Applicable	
Time to Submergence		Not Applicable	
Dust Environment (-/2.2.11/2.2.11)		Not Applicable	

NOTES:

NOTE 1 (from page 5f)

2. SAMPLES

The samples tested were identified as follows:

A. 7 Conductor #12 (7) copper, CC-2115 silicone rubber insulation, glass braid over silicone, glass finished with a flame and abrasion resistant finish CC-1233, 7 conductors cabled, mylar binder tape, overall asbestos braid, asbestos finished with CC-1120 flame and abrasion resistant finish.

B. 2 Conductor #16 (7) copper, CC-2115 silicone rubber insulation, glass braid over silicone, glass braid finished with a flame and abrasion resistant finish CC-1233, 2 conductors cabled with impregnated asbestos fillers, mylar binder tape, overall asbestos braid, asbestos finished with CC-1120 flame and heat resistant finish.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

EQUIPMENT ITEM NO. 36
ELECTRICAL INSTRUMENT CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
CONTINENTAL WIRE MODEL XLPE/HYPALON
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 36
LICENSEE REFERENCE(S): 1207, 86
FUNCTION (PLANT ID): 600V INSTRUMENT CABLE (NUS-341A SN-1439; NUS-411 SN-1458; NUS-341 SN-285/1285)
LICENSEE SUBMITTAL: SCEW(S): 6-59A, -59, -58

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

5) Okonite Company

(a) Type, cross linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

(b) Type, cross linked polyethylene with aluminum armor.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

(c) Type, cross linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

NOTES:

The licensee has provided complete qualification test data for the cable.

PHYSICAL PROPERTIES OF CC-2210 CROSS-LINKED PE AFTER VARIOUS ENVIRONMENTAL CONDITIONING, SIMULATING A L.O.C.A. INCIDENT IN A NUCLEAR GENERATING STATION.

CONDITIONING	TENSILE (PSI)	ELONGATION (%)
NONE	2440	550
STEAM/BORIC ACID[1]	2390	450
RADIATION ONLY		
$1X10^7$ RADS (GAMMA)[2]	2640	425
$5X10^7$ RADS "	2230	238
$1X10^8$ RADS "	1710	100
RADIATION AFTER STEAM/BORIC ACID[1]		
$1X10^7$ RADS (GAMMA)[2]	2580	393
$5X10^7$ RADS (GAMMA)[2]	2200	200
$1X10^8$ RADS (GAMMA)[2]	1600	69

WIRE SAMPLE #16 (7) AWG, .030" WALL CC-2210

① 120 HOURS, 50 PSIG STEAM at 298°F, FOLLOWED BY 120 HOUR IMMERSION IN 0.5% BORIC ACID SOLUTION @ 150°F.

② COBALT 60 SOURCE (NEUTRON PRODUCTS, MD.).

TEST REPORT

QUALIFICATION TEST PROGRAM

OF

ELECTRICAL INSTRUMENTATION CABLES

FOR

VIRGINIA ELECTRIC AND POWER COMPANY

FOR

SURRY POWER STATION
UNITS 1 AND 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ITEM NO. 37
ELECTRICAL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
OKONITE MODEL OKONITE OKOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 37
LICENSEE REFERENCE(S): 2103, 1339
FUNCTION (PLANT ID): 600V POWER CABLE (NAS-3185 NA-3185/4185, 116A NA-128-1128, NUS-374 SN-375, NUS-365D SN-1417, NUS-365C SN-1392, NUS-365B SN-13800)
LICENSEE SUBMITTAL: SCEW(3): 6-57, -56, -50 TO -53

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

For evaluation Refer to item 33 and pg 5-4.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

5) Okonite Company

(a) Type, cross linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

(b) Type, cross linked polyethylene with aluminum armor.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

(c) Type, cross linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

THE OKONITE COMPANY

Post Office Box 340
Ramsey, New Jersey 07446
201-825-0300/Cable Okonite

#2

October 15, 1980

Mr. John Bonner
Stone & Webster Engineering Corporation
Post Office Box 2325
Boston, Massachusetts 02107

Dear Mr. Bonner:

J.O. No. 12846.44
Surry Power Station — VEPCO

Mr. P. Reilly's letter of September 24, 1980 has been referred to me.

Our records indicate that the cables of your letter were as follows:

No.	VEPCO P.O.#	Okonite Factory Order #
1	SN-1380	03-0186
2	SN-1392	03-0469
3	SN-1417	01-3662
4	SN-375	01-3336 / 07-0033
5	SN-1446	01-4136

#1 - 3 x 1/C XLPE/Okoprene

#2 - 3/C - 250 kcmil, Al - X-Olene - Aluminum Armor

#3 - 3/C - 4/0 Okonite EP/Okoprene - Steel Armor
3 x 1/C, 1/0 Okonite EP/Okoprene - Triplex

#4 - 3 x 1/C, 3/0 Okonite EP/Okoprene - Triplex
3 x 1/C, #4 Okonite EP/Okoprene - Triplex

#5 - 2/C, #12 Okonite EP/Okoprene - Okoprene Overall Jacket
7/C, #12 Okonite EP/Okoprene - Okoprene Overall Jacket
1/C, # 6 Okonite EP/Okoprene
2/C, #14 Okonite EP/Okoprene - Okoprene Overall Jacket

Note that although you indicate that the cables are crosslinked polyethylene (XLPE), our records show that only two of the items were XLPE with the others insulated with Okonite EP/Okoprene.

NOTES:

We enclose a recent qualification report (NQRN-1) which covers the Okonite insulation, and has included in the test a chemical spray exposure. The test profile of the report accommodates the profile of your letter with margin.

The Okonite insulation covered by this document is only very slightly modified from that which was supplied to the Surry Station.

The modifications in the compound are not generic in nature and, in our view, do not effect the applicability of the document to your cables.

We point out that the Okoprene on your cables is present for the purpose of imparting flame retardancy to the cable construction, and that it is the insulation alone that must perform through the simulated design basis event. This performance is reported in the document.

The wall thickness of the samples tested were 30 mils which is equal or less than wall thicknesses of Okonite insulation supplied on the cables of the Surry Station so that the test is applicable to all the cables.

Regarding the cables with crosslinked polyethylene, we enclose an IEEE paper which gives information and data on the material. The insulation on the cables is a carbon black filled XLPE, and in the paper this is referred to as CB-XLPE.

I hope the information provided will serve your purposes. If there is anything further we can do, please call me.

Very truly yours,

THE OKONITE COMPANY

J. S. Lasky, Vice President
Research and Engineering

JSL/row
Enclosures

Document is in Surry - 2 [illegible]
[illegible]

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. 463

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

EQUIPMENT ITEM NO. 38
ELECTRICAL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
ANACONDA WIRE AND CABLE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 38
LICENSEE REFERENCE(S): 1347, 77, 79, 76
FUNCTION (PLANT ID): 600V POWER CABLE (NUS-365F SN-462)
LICENSEE SUBMITTAL: SCEW(S): 6-55

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO RE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

NOTES:
The Licensee Provided the following information:

October 28, 1980

Mr. John Bonner
Stone & Webster Engineering Corporation
245 Summer St.
Boston, Mass. 02017

Subject: Virginia Electric & Power Company
Surry Power Station
600-Volt Power Cable
Anaconda Order No. 5-68176
Stone & Webster Order No. (SN-462) SN 21799

Dear Sir:

The subject order was shipped to Virginia Electric & Power Company approximately around August 1972 with the following construction:

3-1/C, 1/0, 19/W, Coated Copper Conductor, 0.078" EP Insulation, 0.045" Black Neoprene Jacket, Triplexed, 600-Volt-Rated.

The EP insulation used on this cable is identical in construction, material and processing method to these samples covered by FIRL Technical Report F-C4350-3 "Test of Electrical Cables Subjected to Thermal Aging, Gamma Radiation and a Loss-of-Coolant Accident Simulation". The function of the jacket is to protect the cable physically and offer fire protection to the whole cable. Although at the present time, we don't have any qualification test document utilizing EP insulation and Neoprene jacket. We trust that the subject cable meets fully the IEEE-323-1974 and IEEE-383-1974 requirements.

If you have any further questions, please don't hesitate to call me. Our toll free number is 1-800-428-5751.

Best regards,

T. H. Ling
Technical Product Manager

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

NOTES:

FRC agrees that the test data is suitable for the application as stated by the manufacturer.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

EQUIPMENT ITEM NO. 39
ELECTRICAL POWER CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
COLLYER INSULATED WIRE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 39
LICENSEE REFERENCE(S): 4019
FUNCTION (PLANT ID): 600V POWER CABLE (NUS-365E SN-457)
LICENSEE SUBMITTAL: SCEW(S): 6-54

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

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

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

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

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

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

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

___ Corrective action specified by the Licensee:

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

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

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

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

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

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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

For evaluation refer to Item 34

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFI[illegible]

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

LICENSEE RESPONSE TO NRC SER (Continued)

1) Collyer Insulated Wire Company type, cross-linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

EQUIPMENT ITEM NO. 40
ELECTRICAL CONTROL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
OKONITE MODEL EP/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 40
LICENSEE REFERENCE(S): 1339, 72, 73
FUNCTION (PLANT ID): 1000V CONTROL CABLE (NUS-381B SN-440/1440, NUS-410 SN-1446)
LICENSEE SUBMITTAL: SCEW(S): 6-42B, -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, (PV) (H) (CS) (A) S, (R), M, I, QM, RPN, EXN, SEN, (QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	____
II.a	Equipment Qualification Not Established	____
II.b	Equipment Not Qualified	____
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	____
III.a	Equipment Exempt From Qualification	____
III.b	Equipment Not in the Scope of the Qualification Review	____
IV	Documentation Not Made Available	____

For evaluation refer to item 33

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO RE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

5) Okonite Company

(a) Type, cross linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

(b) Type, cross linked polyethylene with aluminum armor.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

(c) Type, cross linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

EQUIPMENT ITEM NO. 41
ELECTRICAL CONTROL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
CONTINENTAL WIRE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 41
LICENSEE REFERENCE(S): 3582
FUNCTION (PLANT ID): 1000V CONTROL CABLE (NUS-420 SN-1463)
LICENSEE SUBMITTAL: SCEW(S): 6-42

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT) RT, P, H, (CS) (A) S, R), M, I, QM, RPN, EXN, SEN, (QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, 5h, 5i, ~~5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

LICENSEE RESPONSE TO NRC SER (Continued)

4) Continental Wire and Cable Co.

(a) Type, high temperature silicone rubber cable.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification document has been or will be assembled and available in the central file.

(b) Type, cross-linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

(c) Type, cross-linked polyethylene with hypalon jacket.

All deficiencies identifed in VEPCO's November, 1980 sumbmittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

NOTES:

The Licensee has not established that the test report can be applied to the installed Cables. This is particularly important for Cross Linked Polyethylene where thickness is a major factor in establishing adequate cross linking. If radiation cross linked, then the thickness determines electron energy, beam current and speed of advance of the cable during manufacture. Therefore, qualification of one thickness of insulation cannot be used to establish qualification of any other thickness unless similarity of the molecular structure of the cable insulation can be established. For thick insulations, i.e. greater than 60 mils, space charge effects are often observed which preclude proper crosss linking. For chemically cross linked insulation, processing time and temperatures are critical factors and differ significantly for different insulation thicknesses. Again, unless similarity of molecular structure can be established, use of test reports for different thicknesses is not technically justified.

The Licensee stated:

Question Nos. 4 & 5

This QDR covers all 1000V Control and 600V Instrument XLPE insulated and hypalon jacketed cables bought under specifications NUS-341, 341A, 411 & 420 from Continental Wire & Cable Corporation. Per Attachment #3 of VEPCO letter dated July 14, 1978 (Reference 74) these cables were insulated with carbon filled cross-link polyethelene compound CC-2210 for which all the test reports were supplied.

In 1978 VEPCO had Continental XLPE instrument cable tested again by Conax Corporation (Report #IPS-383 in Reference #75) as requested by NRC.

The only difference between instrument cables & control cables is the thickness of the insulation (the insulation compound is the same). Because the 600V instrument cables which have less thickness than 1000V control cables passed the test we can safely assume control cables are qualified also.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

NOTES:

The following cables were bought under various specifications.

1) Specification No. NUS-341 & 341A; 600V, XLPE/hypalon instrument cables.

   i) Single twisted pair, 2 conductor no. 16 AWG., insul. 25 mils., jkt 45 mils.

   ii) Two twisted pair, 4 conductor no. 16 AWG., insulation 25 mils, jacket 4.

2) Specification No. NUS-411: 600V XLPE/hypalon instrument cables.

   i) 4 conductor #16 AWG., insulation 25 mils, jacket 45 mils.

   ii) 19 conductor #16 AWG.,insulation 25 mils, jacket 60 mils. (black CWC CC-2024)

3) Specification No. NUS-420:

   i) 2 conductor, #12 AWG., insulation 45 mils, jacket 30 mils. (O.D. = 0.500 inch)

   ii) 7 conductor, #12 AWG., insulation 45 mils, jacket 30 mils. (O.D. = 0.695 inch)

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

NOTES:

Requirements for establishing similarity between installed and tested cables are contained in the DOR Guidelines and IEEE 383-74 which are reproduced below for convenience.

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

[DOR]

IEEE-383

1.3.1 *Cable Description.* This description or specification should include as a minimum:

1.3.1.1 Conductor — material identification, size, stranding, coating.

1.3.1.2 Insulation — material identification, thickness, method of application.

1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders.

1.3.1.4 Shielding — tapes, extrusions, braids, or others.

1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application.

1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable.

1.3.1.7 Identification — manufacturer's trade name, catalog number.

1.3.2 *Field Splice or Connection Description or Both.* This description or specification should include as a minimum:

1.3.2.1 Whether factory or field assembled to cable.

1.3.2.2 Conductor connection — type, material identification, and method of assembly.

1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

NOTES:

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual component) or Single conductor power cable	temperature and moisture resistance	2.3.1	1/C – 14 or 12 AWG
	thermal and radiation exposure	2.3.3	1/C or M/C – 14 or 12 AWG
	design basis event simulation	2.4	1/C or M/C – 14 or 12 AWG 1/C – 6, 4 or 2 AWG
	vertical flame test singles from cable assembly	2.5.6	1/C – 14 or 12 AWG
	vertical tray flame test	2.5.4	7/C – 16, 14 or 12 AWG
Shielded pairs, triple or quad from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test	2.5.6	
Coaxial, triaxial or special instrument cable	temperature and moisture resistance	2.3.1	actual size
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test singles from cable assembly	2.5.6	
Single pair thermocouple extension cable	temperature and moisture resistance	2.3.1	2/C – 20 AWG or actual size if smaller
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical tray flame test	2.5.4	
	vertical flame test singles from cable assembly	2.5.6	
2001–15 000 V power cable 1/C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5kV) 2/O or 4/O or 4/O (2-15kV)

In Lieu of the detailed description discussed above it would be acceptable for the licensee to obtain certification from the maunfacturer identifying what test report(s) apply to the cables furnished for installation provided the reports contain adequate qualification information.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

EQUIPMENT ITEM NO. 42
ELECTRICAL CONTROL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
GENERAL ELECTRIC MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 42
LICENSEE REFERENCE(S): 3582
FUNCTION (PLANT ID): 1000V CONTROL CABLE (NUS-381 SN-398)
LICENSEE SUBMITTAL: SCEW(S): 6-40

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, (CS) (A), S, (R), M, I, QM, RPN, EXN, SEN, (QI), RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	4a, ~~4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b,~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c,~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not In Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO RE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.3.10 General Electric Wire Cable (Spec. No. NUS 381)

Based on field test verification (special test 104) obtained subsequent to the February 1980 submittal, it was established that these cables have not been used in safety related applications in Surry Unit No. 1. Therefore, this has been deleted from the Master List.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

[X] Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

[ ] Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

[ ] Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

[ ] Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

[ ] Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

[ ] Backup (equipment/system) is subject to a potentially disabling single active failure.

[ ] Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

[ ] Failure of the primary equipment can result in erroneous indication which could mislead an operator.

[ ] Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

EQUIPMENT ITEM NO. 43
ELECTRICAL INSTRUMENT CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
RAYCHEM MODEL FLAMTROL
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 43
LICENSEE REFERENCE(S): 1831, 1832, 66
FUNCTION (PLANT ID): 300V INSTRUMENT (NAS-3190 3190/4190)
LICENSEE SUBMITTAL: SCEW(S): 6-36

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:

Contents	Checksheet Page No.
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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, ~~5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

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. 483

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	____
II.a	Equipment Qualification Not Established	____
II.b	Equipment Not Qualified	____
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	____
III.a	Equipment Exempt From Qualification	____
III.b	Equipment Not in the Scope of the Qualification Review	____
IV	Documentation Not Made Available	____

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; NUREG-0588, Cat. I___; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	Electric Cable	Electrical Cable	
Manufacturer's Name (5.2.2/-/-)	Raychem	Raychem Corporation	
Model Number (5.2.2/-/-)	See Page 5g	Raychem Flamtrol (see pg. 5i)	Note 1
Serial Number	Not Stated	Not Applicable	
Features/Mounting (5.2.6/-/-)	Not Stated	On Mandrel In Autoclave	
Connections/Interfaces (5.2.6/-/-)	Not Stated	Test Item Is a Cable and Splice	
Location/Elevation	Inside & Outside Containment	Not Applicable	
Equipment ID No.		Not Applicable	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	F-C4033-1	F-C4033-1	
Report Date	N/A	January 1975	
Issued by	N/A	Franklin Institute Research Laboratories	
Prepared for	N/A	Raychem Corporation	
Referenced Reports	N/A	Not Applicable	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	N/A	Simultaneous Test	
QUALIFICATION TEST PROGRAM			
Functional Test Description (5.2.5/2.2.9/2.2.9)	N/A	Insulation Resistance/ Current Carrying Capability and HiPot	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.	Not Stated	See page 5i,	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	N/A	Not Stated	
Accuracy (5.2.5/-/-)	N/A	Not Applicable	
Number of Specimens	N/A	16	
Test Instruments Calibrated	N/A	Yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Passive	Active..Carry current	
Test Duration (5.2.1/-/-)	N/A	30 Days	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	more than 24 hrs	Not Applicable	
Required Function Time	120 days	Not Applicable	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	N/A	Visual Inspection Insulation Resistance Thermal/Radiation Aging	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)	N/A	Visual Inspection Insulation Resistance	
1. Representative Sample		LOCA Simulation	
2. Baseline Data		Visual Inspection/	
3. Performance Extremes		Insulation Resistance/	
4. Thermal Aging		HiPot	
5. Radiation Aging			
6. Wear Aging			
7. Vibration/Seismic			
8. DBE Exposure			
9. Post-DBE Exposure			
10. Inspection			
Aging (5.2.4, 7.0/4.0/4.0)		7 Days @ 150°C	
Thermal Aging/Basis	Arrhenius Analysis	Not Stated	Note 2
Material Aging Evaluation (7.0/-/-)	See Pg 5f	Visual Inspection/ Insulation Resistance	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	Not Stated	Not Stated	
Radiation Aging, Type	Gamma	Gamma	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	1.3×10^7	5×10^7	
Radiation Aging, Dose Rate	Not Stated	Not Stated	
Radiation Aging, Method	N/A	Test	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	Not Stated	Not Stated	
Operational Aging (-/4.2/-)	N/A	Not Stated	
Other Age Conditioning (-/4.2/-)	N/A	Not Stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	40 years	Not Stated in Test Report	Note 2
Normal Ambient Temperature	135°F	Not Applicable	
Normal Ambient Radiation	Not Stated	Not Applicable	
Normal Ambient Humidity	Not Stated	Not Applicable	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	VEPCO Program	Not Applicable	
On-Going Analysis of Failures and Degradation (7.0/-/-)	VEPCO Program	Not Applicable	
Margin (General) (6.0/3.0/3.0)	N/A	Not Stated	
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)	N/A	Not Stated	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
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/HELB	LOCA/ MSLB	
Radiation Type	Gamma	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	2.4×10^7	197.7-209.8 Megarads	
Radiation Dose Rate (rd/hr)	Not Stated	Not Stated	
Radiation Qual. Method (5.3.1/-/-)	N/A	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/-/-)	3.7×10^7	Not Applicable	
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	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS	TEMPERATURE (°F)		
Rate of Temp./Press. Increase	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-720 days	10°F;7Psi/second	
Peak: °F/psig/RH/Time	PRESSURE (psia)	357/70/100%/10 hrs	
Decrease To: °F/psig/RH/Time	59.7, 0-30 min 59.7-14.7, 30-60 min	357-275/70-31/100%/2hrs	
Decrease To: °F/psig/RH/Time	14.7-12.7, 1-48 hr 12.7, 2-720 days	275/31/100%/4days	
Decrease To: °F/psig/RH/Time	RELATIVE HUMIDITY	212/10/100%/26 days	
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	100, 0-720 days	Not Applicable	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	N/A	Test	
Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8)	Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-720 days	3000 ppm Boron 0.064 Molar $Na_2S_2O_3$ NaOH for pH of 10.5	
Spray Density (gpm/ft^2)	Not Stated	0.15	
Spray Duration	Not Stated	30 days	
Submergence Duration (4.1.3/2.2.5/2.2.5)	Not Stated	Not Applicable	
In-Leakage Considered (5.2.6, 5.3.2/-/-)	Not Stated	Not Applicable	
Time to Submergence	Not Stated	Not Applicable	
Dust Environment (-/2.2.11/2.2.11)	Not Stated	Not Applicable	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

NOTES:

Note 2

As discussed by IEEE Standard 383, long service life was simulated during the Franklin Institute Research Laboratories (FIRL) tests. All specimens were heat aged for seven days (168 h) at 150°C while simultaneously receiving 5×10^7 rads of gamma radiation. In addition to this aging, two of the Raychem Flamtrol specimens were pre-aged at Raychem prior to the FIRL test cycle. One was aged for 25 days (600 h) at 150°C and the other was aged for 12 days (288 h) at 160°C. This pre-aging was in addition to the general aging and irradiation that all specimens in the test received. Thus, these two specimens received a TOTAL aging of 32 days (768 h) at 150°C and 12 days (288 h) at 160°C PLUS seven days (168 h) at 150°C, respectively before the Loss Of Coolant Accident (LOCA) simulation.

The times and temperatures selected for the heat aging portion of the qualification testing that Raychem has performed to IEEE Standard 383 were chosen with the following rationale:

1. Heat age in accordance with the standard aging time and temperature in Raychem's Specification for Flamtrol, i.e., seven days (168h) at 150°C. This time and temperature was chosen to demonstrate Raychem Flamtrol's outstanding heat aging properties. The aging rate of these materials as a rule of thumb doubles for each 10°C rise in temperature. (By an analysis of Figure 4 presented later, it may be concluded that Flamtrol's aging rate in this temperature range doubles for each approximate 7°C increase in temperature.) Thus, the increase in temperature from 121°C (the IPCEA/industry standard) to 150°C produces a test 8 to 17 times more severe.

5

2. The additional samples pre-aged by Raychem prior to submission to FIRL were to see how Raychem Flamtrol behaved under even longer simulated service conditions. One specimen was pre-aged by Raychem for 600 hours (25 days) at 150°C and another for 288 hours (12 days) at 160°C. These specimens then went through the FIRL simultaneous irradiation and thermal aging for an additional 168 hours at 150°C prior to LOCA testing.

The subsequent discussion based on an as yet incomplete long term aging program being conducted at Raychem indicates that the samples submitted to FIRL for their aging and LOCA testing underwent the LOCA test with close to or more than the equivalent of 40 years service at 90°C depending on whether they were pre-aged or not.

The Raychem Flamtrol heat aging data gathered so far presented in an Arrhenius plot has been compared to published data for cross-linked polyethylene over the same or nearly the same temperature range. Figure 3 is a reproduction of the "CLPE" data in an IEEE Transactions Paper, T74-044-4[1], Figure 8, except to make the author's line broken and to add the best two intersecting straight lines through the data points. The authors drew a straight line through these data points despite the fact that their data best fits two straight lines.

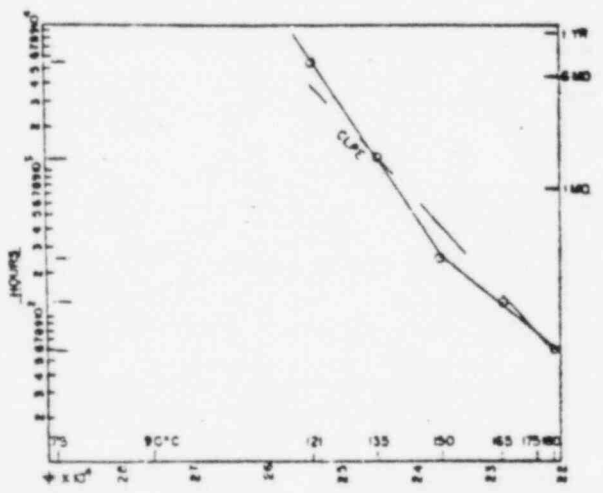

FIGURE 3

The material reported as "CLPE insulation" in the Transactions paper will degrade by the same mechanism as Raychem Flamtrol does since both materials are crosslinked polyethylenes. Hence the shape of the Arrhenius curve for "CLPE insulation" will be the same as the Raychem Flamtrol curve. The positions of the curve may differ due to the use of different end points and the amount and efficacy of stabilizer (anti-oxidant) in the insulation.

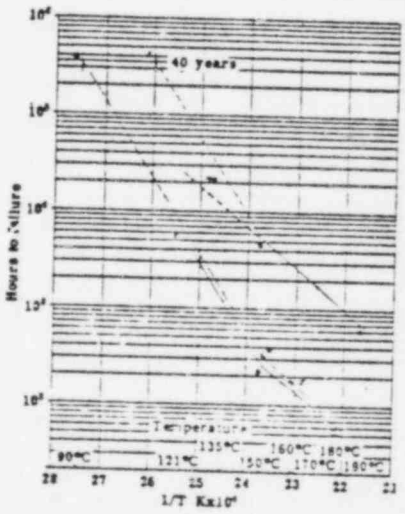

FIGURE 4

Referring to Figure 4, line CD is the "CLPE insulation" data from IEEE Transaction Paper T74-044-4, Figure 8 (Figure 3, above) with a straight line drawn through the data points representing 150, 165 and 180°C. Line DE is also "CLPE insulation" from the Transaction Paper T74-044-4, Figure 8 taken from Figure 3 above with a straight line drawn through the 121, 135 and 150°C data points. Line AB is the data on Raychem Flamtrol from Raychem Lab Report 5054.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

NOTES: 1

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November 17, 1980

Mr. J.H. Barnhart — Infotec (617) 573-7149

John Ruster - Raychem Corporation

Flamtrol Wire & Cable

North Anna Nuclear Unit 3 & 4
Stone & Webster P.O. 3190
Qualification Report F-C4033-1

Reference 1: Telecon between Ivan McFarland of 11/14/80

During my conversation with Ivan Mc Farland, the following cables were identified by him as being part of P.O. 3190:

Item	Description	Item	Description
1.	F2TC16C6	5.	J6/2TC16C6
2.	J2TC16C6	6.	F16/2TC18C6
3.	F3TC16C6	7.	F9F2TC20C6
4.	F2/2TC16C6	8.	F6/2TC16C6

By description, we recognize these cables as our Raychem Flamtrol product line for nuclear application. These products were sold and certified to tests performance by the Franklin Institute and summarized by them in report F-C4033-1, "Tests of Raychem Flamtrol Insulated and Jacketed Electrical Cables Under Simultaneous Exposure To Heat, Gamma Radiation, Steam and Chemical Spray while electrically energized," dated January 1975.

Please consult your file copy of this report for qualification data on these products.

JK:jg

SPECIFICATION NO. NAS-3190

Size & Type	Insul. Thickness (XLPE	Jacket Thickness (XLPE)
2/C #16, overall shield	20 mils	45 mils
2/C #16	20 mils	45 mils
3/C #16, overall shield	20 mils	45 mils
4/C #16, overall shield	20 mils	45 mils
12/C #16	20 mils	60 mils
32/C #18, overall shield	20 mils	80 mils
18/C #20	20 mils	80 mils
12/C #16, overall shield	20 mils	60 mils

2) Question No. 5

NUS compared the insulation systems of the test specimen in the test report versus the insulation system of the cable specified for use in the plant and determined that this test report is applicable for establishing qualification status of the cable, cited in item 1, above. This statement is confirmed by a letter from Flamtrol Wire Company to S&W (Ref. #53).

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

Note 1 (cont'd)

Table 1 Test Specimens

Specimen Description	Number[a]	Length (ft)[b]	Electrical Loading: Voltage (Vrms - 60 Hz)	Electrical Loading: Initial Current (A)[c]
Raychem Flamtrol™ 1000 V insulated wire AWG 12, 45 mil nominal wall Part No. W1TC12C10 (65C0311-12) Run No. P7-10-1-72-6	1 1X	25 22	1000	25
Raychem Flamtrol™ 1000 V insulated wire AWG 6, 45 mil nominal wall Part No. W1TC6B8 (80B0211-6) Run No. P-7-9-13-71-6	2	23	1000	65
Raychem Flamtrol™ 1000 V insulated and jacketed cable, 7 conductor, AWG 12 20 mil nominal wall insulation 90 mil nominal jacket wall Part No. J7TC12C10 Run No. P7-29-74-7	3 3X	21 23	1000	17.5
Raychem Flamtrol™ 600 V insulated and jacketed cable, 2 conductor, AWG 18 Aluminum-polyester shield wrap with AWG 18 drain wire 20 mil nominal wall insulation 45 mil nominal jacket wall Part No. F2TC18C8-C1 Run No. J14-11-6-74-6	4A 4AX	27 23	600	8
Raychem Adverse Service Coaxial Cable AWG 22 conductor 1st insulation layer - 8 mil wall of silane-imide polymer 2nd insulation layer - 49 mil wall of Raydia R™ radiation cross-linked polyolefin Braided copper shield Raychem Flamtrol™ jacket - 34 mil nominal wall Part No. 10483 Run No. J7-6-10-72-6	5 5X	25 25	600	0
Raychem Adverse Service Triaxial Cable AWG 26 conductor 1st insulation layer - 4 mil wall of silane-imide polymer 2nd insulation layer - 129 mil wall of Rayfoam R™ radiation cross-linked cellular polyolefin Braided copper shield 1st jacket - 22 mils of Raychem Flamtrol™ Braided copper shield 2nd jacket - 22 mils of Raychem Flamtrol™ Part No. 10486 Run No. J7-3-1-73-6	6 6X	25 23	600	0
Coaxial Cable Splice Same cable as Specimen Number 5 with splice covered with Thermofit® WCSF-N environmental tubing splice cover (shown illustrated in Figure 1)	7X	20	600	0
Raychem Flamtrol™ 1000 V insulated wire AWG 12, 45 mil nominal wall Part No. W1TC12B10 (Note 2) Run No. P-11-7-12-74-6	10 10X	27 18	1000	25
Same as Specimen Number 10 except preaged before test begins at 150° C (302° F) for 25 days (Notes 2 and 3)	11	28	600 (Note 4)	25
Same as Specimen Number 10 except preaged before test begins at 160° C (320° F) for 12 days (Notes 2 and 3)	12 12X	27 22	1000	25

[a] Cables with suffix "X" were mounted on the outer cable mandrel. See section 4.4.
[b] 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).
[c] 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 Specimens 7 and 8 were Raychem Shrilac™, test results are presented in report number F-C4033-8.
Note 2 Specimens 10, 11, and 12 were an experiment to determine the effect of additional preaging. Specimen 10 was the control for the other two specimens.
Note 3 Information on preaging provided by Raychem.
Note 4 Raychem specified 1000 V rms. Actual voltage used was 600 V rms.
[d] and [e] Trademarks of Raychem Corporation

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

EQUIPMENT ITEM NO. 44
ELECTRICAL INSTRUMENT CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
CERRO WIRE AND CABLE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 44
LICENSEE REFERENCE(S): 1110, 65
FUNCTION (PLANT ID): SUPPLY SIGNAL (NAS-430 NAS-392/1392)
LICENSEE SUBMITTAL: SCEW(S): 6-35

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, (CS), (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/~~or~~ will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

6) Cerro Wire & Cable Co. (Rockbestos)

(a) Type, cross linked polyethylene with neoprene jacket.

All deficiencies identified in VEPCO's November, 1980 sumittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

NOTES:

The Licensee has not established that the test report can be applied to the installed Cables. This is particularly important for Cross Linked Polyethylene where thickness is a major factor in establishing adequate cross linking. If radiation cross linked, then the thickness determines electron energy, beam current and speed of advance of the cable during manufacture. Therefore, qualification of one thickness of insulation cannot be used to establish qualification of any other thickness unless similarity of the molecular structure of the cable insulation can be established. For thick insulations, i.e. greater than 60 mils, space charge effects are often observed which preclude proper creoss linking. For chemically cross linked insulation, processing time and temperatures are critical factors and differ significantly for different insulation thicknesses. Again, unless similarity of molecular structure can be established, use of test reports for different thicknesses is not technically justified.

The Licensee stated:

Qualification Document Review Checklist

Review for: DOR Guidelines [X] NUREG-0588 [ ]

1. Name of the Reviewer: C.J.Endlich Date: 7/15/81
2. Equipment Covered: 1000V. Control Cable, XLPE Insulation, Neoprene Jacket (Cerro Wire & Cable Co.)
3. Equipment Tag No(s).: See Spec. NUS-325, NUS-362&NUS-381C & E

		YES	NO	NA	Page Ref.
4.	Does the report address all of the Class IE equipment in this category listed in the master IE equipment list?		X		See Attachment
*5.	Is the report traceable to the plant equipment?		X		See Attachment
*6.	Does the report specify an acceptance criteria for equipment performance?	X			Rpt. 94 Pyrotr... III, See Attach

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

NOTES:

Attachment #1 to QDR-5437-55-01

Additional Information/Classifications/Justifications

1) Question No. 4

NUS evaluated the test specimen cited in the test report against those types of cables used in the Surry Power Plant Units 1 and 2 and determined this report to be adequate in establishing qualification of the following cables with XLPE insulation and neoprene jacket, used in the Surry Plants:

i) Specification No. NUS-325 & NUS-362

Size and Type	XLPE Insul. Thickness	Neoprene Jacket Thickness
1/C #12	45 mils	45 mils
2/C #12	45 mils	45 mils
3/C #12	45 mils	45 mils
5/C #12	45 mils	60 mils
7/C #12	45 mils	60 mils
9/C #12	45 mils	80 mils
12/C #12	45 mils	80 mils
1/C #10	45 mils	45 mils
2/C #10	45 mils	60 mils
4/C #10	45 mils	60 mils
8/C #10	45 mils	80 mils
1/C #8	45 mils	45 mils
2/C #8	45 mils	60 mils
4/C #8	45 mils	60 mils
1/C #6	55 mils	45 mils
2/C #6	55 mils	60 mils
2/C #14	45 mils	45 mils

ii) Specification No. NUS-381C

Size and Type	XLPE Insul. Thickness	Neoprene Jacket Thickness
2/C #12	45 mils	45 mils
1/C #4 Triplexed	55 mils	30 mils

iii) Specification No. NUS-381E

Size and Type	XLPE Insul. Thickness	Neoprene Jacket Thickness
2/C #6	55 mils	60 mils

2) Question No. 5

NUS compared the insulation system of the test specimen in this test report versus the insulation system of the cables specified for use in the plant and determined that this report is applicable for establishing qualification status of the cables cited in item 1, above.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

NOTES:

The cables tested were described as follows in the test report:

F-C3798

2. SAMPLE IDENTIFICATION

SAMPLE	DESCRIPTION
A	Firewall III: 7/C #12 TCC, 600 volt control cable; 30 mils of flame retardant XLPE insulation; 45 mils of flame retardant neoprene jacket.
B	Firewall EP: 7/C #14 TCC, 600 volt control cable; 30 mils of EPR and 15 mils of flame retardant neoprene composite insulation; 45 mils of flame retardant neoprene jacket.
C	Firewall SR: 5/C #14 TCC, 600 volt control cable; 45 mils of silicone rubber insulation with a 7 1/2 mil glass braid: 45 mil silicone saturated asbestos braided jacket.
D	CSPE instrumentation cable: 3 #16 TCC twisted shielded pairs; 25 mils of flame retardant CSPE insulation; polyester/aluminum shields; 60 mils of flame retardant CSPE jacket.

CSPE = chlorosulfonated polyethylene
XLPE = cross-linked polyethylene

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

NOTES:

Requirements for establishing similarity between installed and tested cables are contained in the DOR Guidelines and IEEE 383-74 which are reproduced below for convenience.

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

[DOR]

IEEE-383

1.3.1 *Cable Description.* This description or specification should include as a minimum:

1.3.1.1 Conductor — material identification, size, stranding, coating.

1.3.1.2 Insulation — material identification, thickness, method of application.

1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders.

1.3.1.4 Shielding — tapes, extrusions, braids, or others.

1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application.

1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable.

1.3.1.7 Identification — manufacturer's trade name, catalog number.

1.3.2 *Field Splice or Connection Description or Both.* This description or specification should include as a minimum:

1.3.2.1 Whether factory or field assembled to cable.

1.3.2.2 Conductor connection — type, material identification and method of assembly.

1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit suitable test readings and evaluation consistent with good testing practice.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4/4

NOTES:

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual component) or Single conductor power cable	temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	thermal and radiation exposure	2.3.3	1/C or M/C — 14 or 12 AWG
	design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG 1/C — 6, 4 or 2 AWG
	vertical flame test singles from cable assembly	2.5.6	1/C — 14 or 12 AWG
	vertical tray flame test	2.5.4	7/C — 16, 14 or 12 AWG
Shielded pairs, triple or quad from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test	2.5.6	
Coaxial, triaxial or special instrument cable	temperature and moisture resistance	2.3.1	actual size
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test singles from cable assembly	2.5.6	
Single pair thermocouple extension cable	temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size if smaller
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical tray flame test	2.5.4	
	vertical flame test singles from cable assembly	2.5.6	
2001–15 000 V power cable 1/C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5kV) 2/O or 4/O or 4/O (2-15kV)

In Lieu of the detailed description discussed above it would be acceptable for the licensee to obtain certification from the maunfacturer identifying what test report(s) apply to the cables furnished for installation provided these reports adequately establish qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

EQUIPMENT ITEM NO. 45
ELECTRICAL INSTRUMENT CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
BOSTON INSULATED WIRE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 45
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SUPPLY SIGNAL (NAS-128 NA-265/1265)
LICENSEE SUBMITTAL: SCEW(S): 6-34

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,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
(IV Documentation Not Available)

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	____
I.b	Equipment Qualification Pending Modification	____
II.a	Equipment Qualification Not Established	____
II.b	Equipment Not Qualified	____
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	____
III.a	Equipment Exempt From Qualification	____
III.b	Equipment Not in the Scope of the Qualification Review	____
IV	Documentation Not Made Available	X

The licensee has referenced qualification Documentation, However it was not included in the documentation package

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

EQUIPMENT ITEM NO. 46
ELECTRICAL CONTROL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
CERRO WIRE AND CABLE MODEL FIREWALL III
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 46
LICENSEE REFERENCE(S): 3830, 63
FUNCTION (PLANT ID): 600V CONTROL CABLE (NAS-3187 NA-3187/4187; NAS-120 NA-312/1312)
LICENSEE SUBMITTAL: SCEW(S): 6-33, -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) (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e~~, 5f, 5g, 5h, 5i, ~~5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	7~~a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Profile Enveloped Adequately	
o Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

__X__ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

NOTES:

The Licensee has not established that the test report can be applied to the installed Cables. This is particularly important for Cross Linked Polyethylene where thickness is a major factor in establishing adequate cross linking. If radiation cross linked, then the thickness determines electron energy, beam current and speed of advance of the cable during manufacture. Therefore, qualification of one thickness of insulation cannot be used to establish qualification of any other thickness unless similarity of the molecular structure of the cable insulation can be established. For thick insulations. i.e. greater than 60 mils, space charge effects are often observed which preclude proper creoss linking. For chemically cross linked insulation, processing time and temperatures are critical factors and differ significantly for different insulation thicknesses. Again, unless similarity of molecular structure can be established, use of test reports for different thicknesses is not technically justified.

The Licensee stated:

Form QDR-3/01/80 Sheet 1
Client ID: Virginia Electric & Power Company QDR-5437-119-01
Plant: Surry 2

Qualification Document Review Checklist

Review for: DOR Guidelines [X] NUREG-0588 [ ]

1. Name of the Reviewer: C. J. Endlich Date: 5/27/81
2. Equipment Covered: 600 V. Control Cable, Fire Wall III (XLPE) Neoprene Jacket, Manufactured by Corro Company
3. Equipment Tag No(s).: Specification NAC-3187 & P.O. No. NA-4187

		YES	NO	NA	Page Ref.
4.	Does the report address all of the Class IE equipment in this category listed in the master IE equipment list?		X		See Attachment No. 1
*5.	Is the report traceable to the plant equipment?		X		See Attachment No. 1
*6.	Does the report specify an acceptance criteria for equipment performance?		X		See Attachment No. 1

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

NOTES:

ATTACHMENT NO. 1 TO QDR-5437-119-01

ADDITIONAL INFORMATION/CLASSIFICATIONS/JUSTIFICATIONS

QUESTION NO. 4

NUS evaluated the test specimen cited in this report against the type of cable used in the Surry Power Plant Unit 1 and 2 and determined this report to be adequate in establishing qualification of the following cables with XLPE insulation and neoprene jacket used in the Surry Plants:

Type and Size	Insul. Thickness	Jacket Thickness
1/C #14	30 Mils	15 Mils
2/C #14	30 Mils	45 Mils
3/C #14	30 Mils	45 Mils
5/C #14	30 Mils	45 Mils
7/C #14	30 Mils	60 Mils
9/C #14	30 Mils	60 Mils
12/C #14	30 Mils	60 Mils
2/C #12	30 Mils	45 Mils
2/C #10	30 Mils	45 Mils
4/C #10	30 Mils	60 Mils
7/C #6	45 Mils	80 Mils
2/C #4	45 Mils	80 Mils
4/C #4	45 Mils	80 Mils
18/C #14	30 Mils	60 Mils
20/C #20	25 Mils	60 Mils

QUESTION NO. 5

NUS compared the insulation system (XLPE) of the test specimen in test reports versus the insulation system of the cables used in the plant and determined that, in accordance with IE Bulletin No. 79-01B, January 14, 1980, Enclosure 4, Paragraph 5.2.2, these reports are applicable for establishing qualification status of the cables cited in Item 1 above.

QUESTION NO. 6

Satisfactory performance of cable, as specified in the report, is based on:

1. Demonstration of good physical characteristics such as elongation retention of 50% or better of the original, and

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

NOTES:

Requirements for establishing similarity between installed and tested cables are contained in the DOR Guidelines and IEEE 383-74 which are reproduced below for convenience.

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

[DOR]

IEEE-383

1.3.1 *Cable Description.* This description or specification should include as a minimum:

1.3.1.1 Conductor — material identification, size, stranding, coating.

1.3.1.2 Insulation — material identification, thickness, method of application.

1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders.

1.3.1.4 Shielding — tapes, extrusions, braids, or others.

1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application.

1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable.

1.3.1.7 Identification — manufacturer's trade name, catalog number.

1.3.2 *Field Splice or Connection Description or Both.* This description or specification should include as a minimum:

1.3.2.1 Whether factory or field assembled to cable.

1.3.2.2 Conductor connection — type, material identification, and method of assembly.

1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

NOTES:

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual component) or Single conductor power cable	temperature and moisture resistance	2.3.1	1/C – 14 or 12 AWG
	thermal and radiation exposure	2.3.3	1/C or M/C – 14 or 12 AWG
	design basis event simulation	2.4	1/C or M/C – 14 or 12 AWG 1/C – 6, 4 or 2 AWG
	vertical flame test singles from cable assembly	2.5.6	1/C – 14 or 12 AWG
	vertical tray flame test	2.5.4	7/C – 16, 14 or 12 AWG
Shielded pairs, triple or quad from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test	2.5.6	
Coaxial, triaxial or special instrument cable	temperature and moisture resistance	2.3.1	actual size
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test singles from cable assembly	2.5.6	
Single pair thermocouple extension cable	temperature and moisture resistance	2.3.1	2/C – 20 AWG or actual size if smaller
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical tray flame test	2.5.4	
	vertical flame test singles from cable assembly	2.5.6	
2001–15 000 V power cable 1/C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2-5kV) 2/O or 4/O or 4/O (2-15kV)

In Lieu of the detailed description discussed above it would be acceptable for the licensee to obtain certification from the maunfacturer identifying what test report(s) apply to the cables furnished for installation provided these reports adequately establish qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ITEM NO. 47
ELECTRIC MOTOR LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-11)
GENERAL ELECTRIC MODEL 5KC37JG770X
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 47
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SERVICE WATER RETURN FROM RECIRCULATION SPRAY HEAT EXCHANGER RADIATION MONITOR (2-SW-P-5A, B, C, D)
LICENSEE SUBMITTAL: SCEW(S): 6-256 TO -259

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) T, (QT) RT, P, H, CS, (A) S, (R), M, I, QM, (RPN) EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f~~, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (~~has~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action scheduled to begin in second quarter of '82.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.1 General Electric Corporation (Radiation Monitoring Pump Motors)

Plant ID No.	Worksheet Page No.
2-SW-P-5A	6-256
2-SW-P-5B	6-257
2-SW-P-5C	6-258
2-SW-P-5D	6-259

7.2.1.1 Modification/Replacement Status

We are replacing these radiation monitoring pump motors.

7.2.1.2 Modification/Replacement Schedule

Based on current projections for material delivery and current outage schedules, the replacements are scheduled to begin during the second quarter of 1982.

7.2.1.3 Justification for Continued Operation

If a postulated accident were to occur, all subject pumps in the accident unit would be affected shortly after the time of the LHSI pump switchover from injection to recirculation mode. The pump would provide initial flow for the monitor until the pump failed and would detect tube failures that were in existence at the time of accident initiation. Since any additional leakage would constitute a single passive failure and passive failures need not be considered for 24 hours after an accident, the operator can determine if significant leakage is occurring by observing the activity indicated on the Service Water main header effluent monitors.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

EQUIPMENT ITEM NO. 48
ELECTRIC MOTOR LOCATED IN SERVICE BUILDING MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
GENERAL ELECTRIC MODEL 5K145DL190KE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 48
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING PUMP COOLING SERVICE WATER PUMP MOTOR (2-SW-P-10A)
LICENSEE SUBMITTAL: SCEW(S): 6-244

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, (T) (QT) RT, (P) (H) CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

_X_ The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/nas not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

_X_ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	(III.b) Not in Scope *mild environment*
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	X
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.4.3 Charging Cooling Service Water Pump

PLANT ID NO.	WORKSHEET PAGE NO.
2-SW-P-10A	6-244
2-SW-P-10B	6-245

The charging pumps themselves are capable of operating for one hour without seal cooling water. Further, an accident rquiring the use of charging pumps in the safety injection mode does not create harsh environment in the area where these pumps are located. Also designs on an alternate source for this cooling water is under consideration.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

EQUIPMENT ITEM NO. 49
ELECTRIC MOTOR LOCATED IN SERVICE BUILDING MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
U.S. ELECTRIC MOTORS MODEL AV9
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 49
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING PUMP COOLING SERVICE WATER PUMP MOTOR (2-SW-P-10B)
LICENSEE SUBMITTAL: SCEW(S): 6-245

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, (T) (QT) RT, (P) (H) (CS) (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/nas not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
(III.b) Not in Scope *Mild environment*
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	____
I.b	Equipment Qualification Pending Modification	____
II.a	Equipment Qualification Not Established	____
II.b	Equipment Not Qualified	____
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	____
III.a	Equipment Exempt From Qualification	____
III.b	Equipment Not in the Scope of the Qualification Review	X
IV	Documentation Not Made Available	____

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.4.3 Charging Cooling Service Water Pump

PLANT ID NO.	WORKSHEET PAGE NO.
2-SW-P-10A	6-244
2-SW-P-10B	6-245

The charging pumps themselves are capable of operating for one hour without seal cooling water. Further, an accident rquiring the use of charging pumps in the safety injection mode does not create harsh environment in the area where these pumps are located. Also designs on an alternate source for this cooling water is under consideration.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

EQUIPMENT ITEM NO. 50
ELECTRIC MOTOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
WESTINGHOUSE MODEL ABDP
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 50
LICENSEE REFERENCE(S): 604, 49
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION PUMP MOTOR (2-SI-P-1A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-201, -202

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, (RPN), EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g ~~5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
Program Established to Identify Aging Degradation	X
Criteria Regarding Aging Simulation Satisfied (If Required)	X
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

c. Westinghouse (Low Head Safety Injection Pump Motors)

Plant ID No.	Worksheet Page No.
1-SI-P-1A	6-198
1-SI-P-1B	6-199

We have replaced the motor lube oil and bearing grease with lubricants qualified to at least 1.4x10E7 rads, which is above the accident dose level.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

NOTES:

(1) WCAP-8754, Rev 1, which is included as part of EQR #604, is essentially a report summarizing results of tests on Class 1E motors for nuclear out-of-containment use and forms the basis for qualification of this equipment to the requirements for (a) operating time, (b) temperature, (c) radiation, and (d) thermal aging. However, no supporting documentation was provided in either WCAP-8754, Rev. 1, or the remainder of EQR #604 to substantiate the claimed capabilities of this equipment item to meet the specified requirements. Further, the licensee did not furnish sufficient evidence regarding the degree of similarity between this equipment item and the motors to which the test report applies.

It is to be noted that the licensee, in its response to the SER, stated that the motor lube oil and bearing grease were replaced by lubricants qualified to at least 1.4×10^7 rads whereas the SCEW sheets claim qualification of the motor to 2×10^8 rads. This discrepancy should be resolved and supporting documentation for the radiation exposure capability of the new lubricants furnished as part of the qualification documentation for this equipment item.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

NOTES:

(2) Regarding its aging evaluation program the Licensee stated (PSR #17):

3.7.2 Aging Evaluation Program

To address the aging evaluation program in a disciplined manner, each safety related Class 1E equipment located in potentially harsh environment areas and, identified in the component evaluation worksheet will be reviewed individually and classified into three categories as follows, based on their qualification methods:

Category A - Equipment tested under LOCA/HELB conditions with preaging included in the test program

Category B - Equipment tested under LOCA/HELB conditions without preaging in the test program

Category C - Equipment not tested under LOCA/HELB conditions

Depending on which category the equipment item falls into, the Licensee provides details relative to the aging evaluation and replacement schedule which will be factored into the existing surveillance program. The qualification documentation for this equipment item should include the detailed maintenance procedures to be employed as well as details regarding the aging surveillance and replacement schedules.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

EQUIPMENT ITEM NO. 51
ELECTRIC MOTOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
GENERAL ELECTRIC MODEL 5K6287XH41A
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 51
LICENSEE REFERENCE(S): 47, 46
FUNCTION (PLANT ID): RECIRCULATION SPRAY PUMP MOTOR (2-RS-P-2A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-167, -168

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) T, (QT) RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, (QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified, ~~and/or will function when exposed to the applicable DBE environmental service conditions.~~

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
(II.a) Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.8 General Electric Corporation (Outside Recirculation Spray Pumps)

Plant ID No.	Worksheet Page No.
2-RS-P-2A	6-167
2-RS-P-2B	6-168

We have replaced the motor lube oil and bearing grease with lubricants qualified to at least 1.4x10E7 rads, which is above the accident dose level.

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5L

NOTES:

(1) The Licensee did not furnish supporting documentation to substantiate the stated radiation exposure capability (see p. 36)

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

EQUIPMENT ITEM NO. 52
ELECTRIC MOTOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
GENERAL ELECTRIC MODEL 5K6227XH206A
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 52
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTROL AND RELAY ROOM CONDENSER WATER PUMP MOTOR (1-VS-P-1A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-117 TO -119

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, (T) (QT) RT, P, (H) CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b ~~3c, 3d~~
System Consideration Review	4a, 4b, ~~4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

The licensee stated the following on the System Component Evaluation Worksheet (SCEW),

> "The control room habitability equipment in unit #1 Service Building Machinery room can provide the function. This can be accomplished by opening cross connect valves in the chilled water supply and return headers. These valves are located in the cable spreading area and are accessible from the control room without being exposed to the turbine building environment."

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ ~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

___ Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

X Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

X Other (see page 4b)

X Resultant NRC Qualification Evaluation Category (IIIa/~~IIIb~~)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3b of this checksheet.

EVALUATION OF LICENSEE STATEMENT

On the SCEW the licensee has stated that this equipment is located in the Mechanical Equipment room #3 which is a harsh environment. The licensee has stated on page 3b that this equipment does not require qualification because backup equipment is available to perform the safety function and this backup equipment is located in the cable spreading area which is a mild environment. In addition to this, the backup equipment is manually operated. In light of the above information, it is concluded that this equipment is exempt from the qualification review.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

EQUIPMENT ITEM NO. 53
ELECTRIC MOTOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
ALLIS CHALMERS MODEL 20783FM28
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 53
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHILLED WATER PUMP MOTOR (1-VS-P-2A)
LICENSEE SUBMITTAL: SCEW(S): 6-120

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, (T) (QT) RT, P, (H) CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	4a, 4b, ~~4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

The licensee stated the following on the System Component Evaluation Worksheet (SCEW),

> "The control room habitability equipment in unit #1 Service Building Machinery room can provide the function. This can be accomplished by opening cross connect valves in the chilled water supply and return headers. These valves are located in the cable spreading area and are accessible from the control room without being exposed to the turbine building environment."

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ ~~non concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

___ 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)

X Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. ~~See note (1) on page 4b.~~ (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

X Other (see page 4b)

X Resultant NRC Qualification Evaluation Category (IIIa/~~IIIb~~)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3b of this checksheet.

EVALUATION OF LICENSEE STATEMENT

On the SCEW the licensee has stated that this equipment is located in the Mechanical Equipment room #3 which is a harsh environment. The licensee has stated on page 3b that this equipment does not require qualification because backup equipment is available to perform the safety function and this backup equipment is located in the cable spreading area which is a mild environment. In addition to this, the backup equipment is manually operated. In light of the above information, it is concluded that this equipment is exempt from the qualification review.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ITEM NO. 54
ELECTRIC MOTOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
ALLIS CHALMERS MODEL 20783FM19
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 54
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHILLED WATER PUMP MOTOR (1-VS-P-2B)
LICENSEE SUBMITTAL: SCEW(S): 6-121

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, (T) (QT) RT, P, (H) CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	4a, 4b, ~~4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c,~~ 5d, 5e, 5f, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/nas not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
[III.a Exempt]
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

The licensee stated the following on the System Component Evaluation Worksheet (SCEW),

> "The control room habitability equipment in unit #1 Service Building Machinery room can provide the function. This can be accomplished by opening cross connect valves in the chilled water supply and return headers. These valves are located in the cable spreading area and are accessible from the control room without being exposed to the turbine building environment."

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ ~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

___ Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

X Other (see page 4b)

X Resultant NRC Qualification Evaluation Category (IIIa/~~IIIb~~)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3b of this checksheet.

EVALUATION OF LICENSEE STATEMENT

On the SCEW the licensee has stated that this equipment is located in the Mechanical Equipment room #3 which is a harsh environment. The licensee has stated on page 3b that this equipment does not require qualification because backup equipment is available to perform the safety function and this backup equipment is located in the cable spreading area which is a mild environment. In addition to this, the backup equipment is manually operated. In light of the above information, it is concluded that this equipment is exempt from the qualification review.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

EQUIPMENT ITEM NO. 55
ELECTRIC MOTOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
ALLIS CHALMERS MODEL 20783FM
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 55
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHILLED WATER PUMP MOTOR (1-VS-P-2C)
LICENSEE SUBMITTAL: SCEW(S): 6-122

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, (T) (QT) RT, P, (H) CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b ~~3c, 3d~~
System Consideration Review	~~4a~~, 4b, ~~4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f~~, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

The licensee stated the following on the System Component Evaluation Worksheet (SCEW),

"The control room habitability equipment in unit #1 Service Building Machinery room can provide the function. This can be accomplished by opening cross connect valves in the chilled water supply and return headers. These valves are located in the cable spreading area and are accessible from the control room without being exposed to the turbine building environment."

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

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)

X Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. ~~See note (1) on page 4b.~~ (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

X Other (see page 4b)

X Resultant NRC Qualification Evaluation Category (IIIa/~~IIIb~~)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function..

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page ~~3a~~ 3b of this checksheet.

EVALUATION OF LICENSEE STATEMENT

On the SCEW the licensee has stated that this equipment is located in the Mechanical Equipment room #3 which is a harsh environment. The licensee has stated on page 3b that this equipment does not require qualification because backup equipment is available to perform the safety function and this backup equipment is located in the cable spreading area which is a mild environment. In addition to this, the backup equipment is manually operated. In light of the above information, it is concluded that this equipment is exempt from the qualification review.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

EQUIPMENT ITEM NO. 56
ELECTRIC MOTOR LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-27A)
GENERAL ELECTRIC MODEL 5K6319XJ1D
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 56
LICENSEE REFERENCE(S): 44, 43, 41
FUNCTION (PLANT ID): RECIRCULATION SPRAY PUMP MOTOR (2-RS-P-1A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-123, -124

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, (CS), (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, ~~5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

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.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ 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 (Aging Evaluation Program)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (~~has~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
(II.c) Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	X
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

NOTES:

WPSR #41 does not adequately address thermal aging of the motor. Attachment #1 of PSR #41 employs the results of a thermal aging test, stated to have been performed in accordance with IEEE Stds 275-1966 and 334-1974, to derive the equivalent operating life for plant LOCA conditions. However, no supporting documentation was provided to substantiate the claimed 40 year life which includes long periods of dormancy in the containment environment as well as periodic motor test runs. Specifically, the potential for deterioration of the various motor elements such as bearings, seals, insulation and metallic parts under the non-accident containment environment was not addressed.

Regarding its aging evaluation program, the licensee stated (PSR #17):

3.7.2 Aging Evaluation Program

To address the aging evaluation program in a disciplined manner, each safety related Class 1E equipment located in potentially harsh environment areas and, identified in the component evaluation worksheet will be reviewed individually and classified into three categories as follows, based on their qualification methods:

Category A - Equipment tested under LOCA/HELB conditions with preaging included in the test program

Category B - Equipment tested under LOCA/HELB conditions without preaging in the test program

Category C - Equipment not tested under LOCA/HELB conditions

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

NOTES:

Note (1) continued

3.7.2.1 Category A *

Category A includes the equipment which was qualified by type tests. These type tests include (1) simulated aging test including thermal, radiation aging, and mechanical and electrical cycling where applicable, and (2) design-basis-event tests to verify the equipment's functional capability following simulated aging. In these cases a qualified-life estimate, based on most limiting of the thermal and radiation aging tests, was established. For this equipment, an Ongoing Aging evaluation and replacement schedule will be factored into an existing surveillance program, which includes:

3.7.2.1.1 The performance of routine preventive maintenance in accordance with established procedures based on manufacturers' recommendations and plant operating experience.

3.7.2.1.2 Parts replacements on which the expected qualified-life is contingent. Based on the review of the qualification tests and the results thereof Vepco has identified the parts replacements such as gaskets and lubricants that are required. The existing preventive maintenance programs for each piece of equipment will be revised to include these.

3.7.2.1.3 The evaluation of equipment failures to identify any trends that indicate a potential for common mode failure so corrective actions can be initiated. The failure evaluation program will specifically address the following.

A record will be maintained of all failures of safety related Class 1E equipment. Periodically failure records will be reviewed to determine:

(a) Repetitive nature

(1) Is the same type failure occurring on the same equipment and at some definite intervals?

(2) Is the same type failure occurring at a definite interval on similar equipment?

(b) Timing of the failures with respect to any environmental condition changes

(c) Other causes indicative of equipment in-service aging degradation.

Vepco currently has an administrative procedure that addresses this requirement. This procedure when fully developed and implemented will provide the additional information required to detect impending age related failure and initiate corrective action.

* this equipment item falls into category A. The test envelope the resident condition by a wide margin, however the qualification documentation for this equipment item should include the detailed maintenance procedures to be employed for this equipment over the 40 year plant life.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

EQUIPMENT ITEM NO. 57
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING VENTILATION (AB-45)
SIEMENS-ALLIS MODEL 444TS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 57
LICENSEE REFERENCE(S): 5213
FUNCTION (PLANT ID): AUXILIARY BUILDING VENTILATION (1-VS-F-58A)
LICENSEE SUBMITTAL: SCEW(S): 6-110
FUNCTION (PLANT ID): AUXILIARY BUILDING CONTROL AREA EXHAUST FAN (1-VS-F-58B)
LICENSEE SUBMITTAL: SCEW(S): 6-111

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), (T), (QT), RT, (P), (H), CS, (A), S, (R), M, I, QM, (RPN), EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

b. Charging Pump Motors Associated Equipment

HELB Qualification

The central area exhaust fans and motor operated dampers, are associated with the charging pump motors. This equipment is not required to assure continued operation of the charging pump motors and serve no other safety functions to mitigate the consequences of DBA/HELB. They will be deleted from the master list.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

EQUIPMENT ITEM NO. 58
ELECTRIC MOTOR LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-27)
MANUFACTURER AND MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 58
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): AUXILIARY FEEDWATER PUMP MOTOR (2-FW-P-3A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-104A, B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, (T) (QT) RT, (P) (H) CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	4a, 4b, ~~4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f~~, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.4.1 Auxiliary Feedwater Pumps

PLANT ID NO.	WORKSHEET PAGE NO.
2-FW-P-3A	6-101A
2-FW-P-3B	6-101B

HELB Mitigation

As a result of the study performed for Appendix D to the FSAR, modifications were made to the Auxilary Feedwater System. These modifications included the installation of cross connect valves which provide the capability of feeding Unit 1 steam generators using the Unit 2 Auxiliary Feedwater Pumps. To ensure that an adequate supply of condensate is available to supply both units, Auxiliary Feedwater Transfer Pumps (2-FW-P-4A&B) were installed in the Unit 2 Containment Spray Pumphouse. These pumps take a suction on the horizontal condensate storage tank, which is a buried tank, and discharge to the suction of the Auxiliary Feedwater Pumps.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

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)

X Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. ~~See note (1) on page 4b.~~ (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

X Other (see page 4b)

X Resultant NRC Qualification Evaluation Category (IIIa/~~IIIb~~)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page ~~3a~~ 3b of this checksheet.

EVALUATION OF LICENSEE STATEMENT

On the SCEW the licensee has stated that this equipment is located in the Main Steam Valve House which is a harsh environment. The licensee has stated on page 3b that this equipment does not require qualification because backup equipment is available to perform the safety function and this backup equipment is located in the cable spreading area which is a mild environment. In addition to this, the backup equipment is manually operated. In light of the above information, it is concluded that this equipment is exempt from the qualification review.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

EQUIPMENT ITEM NO. 59
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING
MANUFACTURER AND MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 59
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT VACUUM PUMP MOTOR (2-CV-P-1B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-79, -78

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) T, (QT) RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	4a, ~~4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a) Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO RE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.3.7 Containment Vacuum Pump Motors

2-CV-P-1A
2-CV-P-1B

These pumps are not required to function after a containment isolation signal is received. By design the containment pressure will return to sub-atmospheric conditions within an hour after an LOCA and remain sub-atmospheric for 30 days without mechanical removal of air during that time.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

EQUIPMENT ITEM NO. 60
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
GENERAL ELECTRIC MODEL 5K182DL1342A
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 60
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING PUMP COOLING MOTOR (2-CC-P-2B)
LICENSEE SUBMITTAL: SCEW(S): 6-62

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) (T) (QT) RT, (P) (H) CS, (A) S, (R), M, I, QM, (RPN) EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f~~, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (~~has~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action to "begin" First quarter of '83.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO RE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.7 General Electric Corporation (Charging Pump Component Cooling Water Pumps)

PLANT ID NO.	WORKSHEET PAGE NO.
2-CC-P-2A	6-61
2-CC-P-2B	6-62

7.2.7.1 Modification/Replacement Status

We will replace the charging pump component cooling water pump motors with qualified replacement units.

7.2.7.2 Modification/Replacement Schedule

Based on current projections for purchase order placement, material delivery and our present outage schedule, replacement is scheduled to start during the first quarter of 1983.

7.2.7.3 Justification For Continued Operation

The charging pump component cooling water pumps provide seal and cooling water for the mechanical seals of the charging pumps during their operation. In the event of a cooling water pump failure, the manufacturer has determined that the water reservoir surrounding the charging pump mechanical seals should provide a sufficient buffer to extend the operation of the pumps for approximately one (1) hour. Further, since during the use of the charging pumps in its safety injection mode, it is handling cold water from the refueling water storage tank, which will minimize the heat load for the charging cooling system.

On the basis of the above, it is concluded that the component cooling water pumps will perform their intended safety function, and will have no impact on plant safety

Please Send Copy of XA to PDR

TECHNICAL EVALUATION REPORT

REVIEW OF LICENSEES' RESOLUTION OF OUTSTANDING ISSUES FROM NRC EQUIPMENT ENVIRONMENTAL QUALIFICATION SAFETY EVALUATION REPORTS (F-11 and B-60)

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNIT 2 VOL. 2 OF 2

NRC DOCKET NO. 50-281
NRC TAC NO. 42469
NRC CONTRACT NO. NRC-03-79-118

FRC PROJECT C5257
FRC ASSIGNMENT 13
FRC TASK 483

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

December 22, 1982

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Franklin Research Center
A Division of The Franklin Institute
The Benjamin Franklin Parkway, Phila., Pa. 19103 (215) 448-1000

TECHNICAL EVALUATION REPORT

REVIEW OF LICENSEES' RESOLUTION OF OUTSTANDING ISSUES FROM NRC EQUIPMENT ENVIRONMENTAL QUALIFICATION SAFETY EVALUATION REPORTS (F-11 and B-60)

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Reviewed by:

Group Leader

Approved by:

Project Manager

Department Director

Franklin Research Center
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The Benjamin Franklin Parkway, Phila., Pa. 19103 (215) 448-1000

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

EQUIPMENT ITEM NO. 61
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
GENERAL ELECTRIC MODEL 5K182DL126
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 61
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING PUMP COOLING MOTOR (2-CC-P-2A)
LICENSEE SUBMITTAL: SCEW(S): 6-61

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) (T) (QT) RT, (P) (H) CS, (A) S, (R), M, I, QM, (RPN) EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f~~, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (~~nas~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action to "begin" first quarter of '83.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. G1

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.7 General Electric Corporation (Charging Pump Component Cooling Water Pumps)

PLANT ID NO.	WORKSHEET PAGE NO.
2-CC-P-2A	6-61
2-CC-P-2B	6-62

7.2.7.1 Modification/Replacement Status

We will replace the charging pump component cooling water pump motors with qualified replacement units.

7.2.7.2 Modification/Replacement Schedule

Based on current projections for purchase order placement, material delivery and our present outage schedule, replacement is scheduled to start during the first quarter of 1983.

7.2.7.3 Justification For Continued Operation

The charging pump component cooling water pumps provide seal and cooling water for the mechanical seals of the charging pumps during their operation. In the event of a cooling water pump failure, the manufcturer has determined that the water reservoir surrounding the charging pump mechanical seals should provide a sufficient buffer to extend the operation of the pumps for approximately one (1) hour. Further, since during the use of the charging pumps in its safety injection mode, it is handling cold water from the refueling water storage tank, which will minimize the heat load for the charging cooling system.

On the basis of the above, it is concluded that the component cooling water pumps will perform their intended safety function, and will have no impact on plant safety

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ITEM NO. 62
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING CHARGING PUMP CUBICLE (AB-2C)
WESTINGHOUSE MODEL 68F13318
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 62
LICENSEE REFERENCE(S): 604, 33
FUNCTION (PLANT ID): HIGH HEAD SAFETY INJECTION/NORMAL CHARGING (2-CH-P-1C, B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-7 TO 6-9

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	1a
Summary of Licensee Responses to the NRC SER	1b
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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, ~~5e,~~ 5f, 5g, 5h, ~~5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified ~~and/or will function when exposed~~ to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
(II.a) Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	X
Qualified Life or Replacement Schedule Established (If Required)	X
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	X
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.2 Westinghouse Electric Corporation

a. Charging Pump Motors

Plant ID No.	Worksheet Page No.
1-CH-P-1A	6-7
1-CH-P-1B	6-8
1-CH-P-1C	6-9

All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

LOCA Qualification

We have replaced the motor lubrication with lubricants qualified to 1.4x10E7 rads, which is above the accident dose level.

HELB Qualification

Through further review of the qualification documentation for the charging pumps we have determined that they are qualified for the HELB environment in the Auxiliary Building. All deficiencies identified in VEPCO's November, 1980 submittal, and the NRC's SER Appendix B have been resolved. Details are provided in the updated Component Evaluation Worksheets. Complete qualification documentation has been, or will be assembled and available in the central file.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; NUREG-0588, Cat. I___; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION Equipment Type	Electric motor	Motorette	
Manufacturer's Name (5.2.2/-/-)	Westinghouse	Westinghouse	
Model Number (5.2.2/-/-)	68659	N/A	Note 1 X
Serial Number	N.D	N/A	
Features/Mounting (5.2.6/-/-)	N.D	class B Thermolastic Epoxy stator Insulation	
Connections/Interfaces (5.2.6/-/-)	N.D	N/A	
Location/Elevation	Aux. Bldg. charging Pump Cubicle	N/A	
Equipment ID No.	1-CH-P1A,B,C	N/A	
QUALIFICATION REPORT (8.0/5.0/5.0) Report ID Number	QDR-5937-8-1 Discusses →	WCAP-8754	
Report Date	march 5, 1982	00-Jun-76	
Issued by	NUS Corp.	westinghouse	
Prepared for	Surry 1	westinghouse	
Referenced Reports	WCAP-8754	WCAP-7829 for radiation resistance	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	test + Analysis	test	
QUALIFICATION TEST PROGRAM Functional Test Description (5.2.5/2.2.9/2.2.9)		dielectric Strength, I R (Hipot)	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.		N/A	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)		not stated	
Accuracy (5.2.5/-/-)		not stated	
Number of Specimens		not stated	
Test Instruments Calibrated		not stated	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Active	N/A	
Test Duration (5.2.1/-/-)	N/A	N/A	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	120 Days	N/A	Note 2 X
Required Function Time	120 Days	N/A	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)		not stated (separate tests)	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)			
1. Representative Sample			
2. Baseline Data			
3. Performance Extremes			
4. Thermal Aging			
5. Radiation Aging			
6. Wear Aging			
7. Vibration/Seismic			
8. DBE Exposure			
9. Post-DBE Exposure			
10. Inspection			
Aging (5.2.4, 7.0/4.0/4.0)		IEEE 275-1966	X Note 3
Thermal Aging/Basis	No Basis		
Material Aging Evaluation (7.0/-/-)	not performed	not stated	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	Thermoplastic Epoxy enamel Ins.	not stated	
Radiation Aging, Type	γ	not stated	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	2.8×10^6 R	2×10^8 R (TLD dose)	
Radiation Aging, Dose Rate	N.D	not stated	
Radiation Aging, Method		test	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	all Nonmetallics	epoxy impregnant	
Operational Aging (-/4.2/-)		500 cycles of line started at Full load voltage until Full speed achieved ⇒ immediately reversed	
Other Age Conditioning (-/4.2/-)		not stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	40 years	44,000 running hrs. (5 yrs continuous) Class B operation	X Note 3
Normal Ambient Temperature Normal Ambient Radiation Normal Ambient Humidity	N.D.	130°C (insulation temp.)	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)		not stated	
On-Going Analysis of Failures and Degradation (7.0/-/-)		not stated	
Margin (General) (6.0/3.0/3.0)			
Margin (NUREG-0588, Cat. I) (-/3.2/-) 1. Temperature (+15°F) 2. Pressure (+10%, 10 psig max) 3. Radiation (not required) 4. Time (+10%, +1 hour + function time minimum)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

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	N/A	
Radiation Type	γ	not stated	
Radiation Dose (rd) (4.1.2/1.4/1.4)	8×10^6	2×10^8 R (+L dose)	
Radiation Dose Rate (rd/hr)	ND	not stated	
Radiation Qual. Method (5.3.1/-/-)	test	test	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)			
Equipment Susceptible to Beta Radiation (4.1.2/-/-)			
Radiation Dose (Normal + Accident) (4.1.2/-/-)	1.8×10^7 R	2×10^8 R	Note 4
Plateout Dose Considered (-/1.48/1.48)			
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

NOTES:

These motors require qualification for thermal aging and radiation exposure (1×10^7 R). The motors are considered out of scope of this Review (mild environment temp./pres.) for an HELB in the Auxiliary Building due to their primary function, in this case, being essentially "Cold Shutdown". However, the 40 year + LOCA radiation dose is 1.8×10^7 R. Since these items are required to mitigate a LOCA in containment they must be reviewed wrt qualification for the harsh radiation environment and thermal aging.

The licensee has referenced an NUS Qualification Review Package (QDR-5437-8-01) which discusses WCAP-8754 as evidence of qualification.

Note 1: WCAP-8754 discusses testing performed on the insulation system used in the installed motors. The Qualification Review Package does not establish that the same bearing lubricant and motor to lead splice materials used in the installed motors were tested in the referenced reports.

Note 2: The licensee has not provided evidence that the motors will operate for the required 120 days after a 40 year installed life and radiation exposure

NOTES:

Note 3: WCAP-8754 establishes a qualified life of 44,000 hours of continuous operation at Class B limits (130°C). The report does not state the Aging time/temperature combination used to establish this. In addition the Qual. Rev. Pack. claims a qualified life of 40 years for the entire motor due to a thermal aging program performed on the stator insulation in the WCAP referenced. The Package Further states that the insulation system was aged at 200°C For 700 hours.

- The motor to lead splice materials were not aged in WCAP-8754.

- The aging time/temperature quoted by the Qual. Review Package was obtained From a plot in the referenced WCAP. The report does not state the program that was implemented.

- The Qual. Review Package does not submit a basis For the stated qualified life of 40 years From the data presented. In addition the normal ambient temperature of the room was not stated nor was the possible dependency on HVAC systems mentioned for maintaining the normal ambient

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

NOTES:

(cont) • It should be noted that the 44,000 hrs of continuous operation at class B limits could be extrapolated via the arrhenius technique to establish a qualified life estimate for the installed motors if the following information is known:

1) # of hours of operation at what ambient temperature during the installed life

2) normal ambient temperature of the room for the remainder of the installed life.

Note 4: The licensee should establish that the motor to lead splice materials qualified by WCAP-7829 are similar to those in the installed motors.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

EQUIPMENT ITEM NO. 63
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING CABLE VAULT (AB-13B)
CUTLER HAMMER MODEL UNITROL
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 63
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SUPPLY POWER TO SAFETY SYSTEMS (2-H1-2 SOUTH, NORTH; 2-J1-2 EAST, WEST)
LICENSEE SUBMITTAL: SCEW(S): 6-23 TO -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, QM, RPN, EXN, SEN, (QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e~~, 5f, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~nas not~~) provided a response to the SER concerns.

___ The Licensee (has/nas not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

LICENSEE RESPONSE TO NRC SER (Continued)

7.3.12 Cutler-Hammer (480V Motor Control Center)

This equipment is not located in harsh environment and therefore the component evaluation worksheet has been deleted.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

NOTES:

A radiation dose of $5.06 E04 R$ is considered a harsh parameter.

∴ This equipment is under the scope of this review and qualification has not been established.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

EQUIPMENT ITEM NO. 64
MOTORIZED VALVE ACTUATOR LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-11)
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 64
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): RECIRCULATION SPRAY HEAT EXCHANGER SERVICE WATER SUPPLY (MOV-SW-204A, B, C, D; -205A)
LICENSEE SUBMITTAL: SCEW(S): 6-246 TO -250
FUNCTION (PLANT ID): SERVICE WATER OUTLET RECIRCULATION SPRAY HEAT EXCHANGER (MOV-SW-205B)
LICENSEE SUBMITTAL: SCEW(S): 6-251
FUNCTION (PLANT ID): RECIRCULATION SPRAY HEAT EXCHANGER (MOV-SW-205C, D)
LICENSEE SUBMITTAL: SCEW(S): 6-252, -253

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, ~~5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; NUREG-0588, Cat. I ___; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	MVA	Motorized Valve Actuator	
Manufacturer's Name (5.2.2/-/-)	Limitorque	Limitorque	
Model Number (5.2.2/-/-)	SMB; Various sizes	SMB-0	
Serial Number	NOTE 1	195004	NOTE 1
Features/Mounting (5.2.6/-/-)	See Pg. 1a & NOTE 2	Reliance AC Motor Class B Insulation also Electric Apparatus Motor with Class B Insulation	NOTE 2, 7
Connections/Interfaces (5.2.6/-/-)	NOTE 3	Not Stated	NOTE 3
Location/Elevation	See Pg. 1a	Not Applicable	
Equipment ID No.	See Pg. 1a	Not Applicable	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	—	B0003	
Report Date	—	June 1976	
Issued by	—	Limitorque Corporation	
Prepared for	—	Limitorque	
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)	—	Cycling/Insulation Resistance	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.	NOTE 4	Not Applicable	NOTE 4

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	—	Not Stated	
Accuracy (5.2.5/-/-)	—	Not Applicable	
Number of Specimens	—	1 Actuator + 2 Motors	
Test Instruments Calibrated	—	Yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	ACTIVE	Not Applicable	
Test Duration (5.2.1/-/-)	—	16 Days	NOTE 5
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	1 hour (max.)	Not Applicable	
Required Function Time	See Pg. 1a	Not Applicable	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	—	Thermal Aging Mechanical Cycling Radiation Exposure Seismic Aging LOCA Simulation	
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	/	Not Applicable	
Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	120°F for 40 years (Design)	(B0058 provides data on epoxy life) 199.8 hrs @ 165°F/100%RH	NOTE 6
Material Aging Evaluation (7.0/-/-)	NOTE 6	Not Applicable	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	—	Not Stated	
Radiation Aging, Type	GAMMA	Gamma	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	2.8 E06 rd (max. - see SCEW for exact value)	See Accident Dose	
Radiation Aging, Dose Rate	—	See Accident Dose	
Radiation Aging, Method	—	Test	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	—	Not Stated	
Operational Aging (-/4.2/-)	—	2000 cycles at rated Load	
Other Age Conditioning (-/4.2/-)	—	Seismic	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	40 years / 40 years	40 Years outside containment	NOTE 6
Normal Ambient Temperature	120°F	Not Applicable	
Normal Ambient Radiation*	8 R/hr	Not Applicable	
Normal Ambient Humidity**	20-90%	Not Applicable	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	yes	Not Applicable	
On-Going Analysis of Failures and Degradation (7.0/-/-)	yes	Not Applicable	
Margin (General) (6.0/3.0/3.0)	—	Not Stated	
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)		Not Applicable	

* $\left(\frac{2.8\,E06\,rd}{40\,yrs}\right)\left(\frac{365\,d}{1}\right)\left(\frac{24\,hr}{d}\right) \cong 8.0\,R/hr$

** Assumed by FRC

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	MSLB	LOCA/HELB outside Containment	
Radiation Type	GAMMA	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	8.0E06 rd (max.) See SCEW for exact value	2×10^7 (Complete Actuator) 2.04×10^8 (2 Motors)	
Radiation Dose Rate (rd/hr)	—	1 Mrd/hr	
Radiation Qual. Method (5.3.1/-/-)	—	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/-/-)	—	No	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	1.0E07 rd (max.) see SCEW for exact value	Not Applicable	
Plateout Dose Considered (-/1.48/1.48)	—	Not Applicable	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	—	Not Applicable	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE * OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase	2.8°F/sec.; 0.5psig/min	13°F, 2.5psi/sec	
Peak: °F/psig/RH/Time	205/15.2/100 1000 sec.	250/25/100/24 hrs	
Decrease To: °F/psig/RH/Time	160/14.9/100 14 min	200/10/100/15 days	
Decrease To: °F/psig/RH/Time	120/14.9/100 1 hour		
Decrease To: °F/psig/RH/Time			
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	—	Not Applicable	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	N/A	Not Applicable Outside Containment application	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)		Not Applicable	
Spray Density (gpm/ft^2)		Not Applicable	
Spray Duration		Not Applicable	
Submergence Duration (4.1.3/2.2.5/2.2.5)	NOT REQUIRED	Not Applicable	
In-Leakage Considered (5.2.6, 5.3.2/-/-)		Not Stated but none apparent in photographs	
Time to Submergence		Not Applicable	
Dust Environment (-/2.2.11/2.2.11)	—	Not Applicable	

* enveloping profile of maximum outside containment values used for comparison. (excludes Mechanical Equipment Room #3.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NOTES:

1. Serial numbers are provided in PSR # 29 on the "walk-down" sheets
2. For most motorized valve actuators (MVAs) the motor manufacturer, class of insulation and whether or not the MVA has a motor-brake assembly has been identified in PSR #29 and on the SCEW(s)
3. The component interfaces (i.e. motor leads, splices) are not considered part of the MVA by the licensee, but will be addressed separately.
4. The nameplate operating conditions for the MVA (and brakes where applicable) are provided in PSR #29 on the "walk-down" sheets.
5. For the equipment located outside containment, a required operating time of 120 days is specified. The test lasted only 16 days. PSR #29 has attempted to extrapolate the qualified duration by using the Arrhenius technique and the elevated, saturated steam conditions reported in PGR #662 (BOOS 3). The following

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NOTES:

is noted with respect to this application of the Arrhenius Technique.

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 justifying 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 by oxidation--when exposed to elevated temperatures in the presence of air. 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 as an aging procedure. In addition, the Arrhenius 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 anomalies 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.

Though the licensee has not provided this technical basis, it is noted that the MVA tested showed no indication that exposure to continued post-accident conditions would result in a failure of

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NOTES:

The device. As such, this MVA is considered qualified for the specified operating time.

6. Thermal aging has been addressed in the BOP58 report for the motor insulation and is acceptable. The licensee has also addressed seals, gaskets (Not required for absolute sealing) & lubricants. The limit and torque switches are generally made of a phenolic material and would generally not experience significant thermal degradation. The licensee has also stated that the interfaces will be address as separate items. The licensee should be aware that teflon is used in many motor leads as insulation and is susceptible to thermal and radiation degradation. The licensee has also addressed terminal strips (blocks) and connectors in this review. All information reviewed is acceptable.

7. The difference in motor manufacturers has been adequately addressed.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

EQUIPMENT ITEM NO. 65
MOTORIZED VALVE ACTUATOR LOCATED IN THE SERVICE BUILDING
LIMITORQUE MODEL SMB00
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 65
LICENSEE REFERENCE(S): 29
FUNCTION (PLANT ID): SERVICE WATER (MOV-SW-107B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-254, -255

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, (T), (QT), RT, (P), (H), CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
[III.a Exempt]
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.3.16 Motor Operated Valves (Service water)

MOV-SW-107B
MOV-SW-107C

These valves were disconnected during control and relay room chiller modification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/~~non-concurrence with~~ the technical basis of the Licensee's position are presented below.

Reason for Concurrence

X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

X Other (see page 3b)

X Resultant NRC Qualification Evaluation Category (IIIa/~~IIIb~~)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3b of this checksheet.

EVALUATION OF LICENSEE STATEMENT

These values have been disconnected, Therefore, qualification is a moot point.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

EQUIPMENT ITEM NO. 66
MOTORIZED VALVE ACTUATOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
LIMITORQUE MODEL SMB WITH CLASS B INSULATION, SIZE 000, 1, 2; WITH MOTOR-BRAKE ASSEMBLY
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 66
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION DISCHARGE VALVE (MOV-2864A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-231, -232
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION STOP VALVE (MOV-2890C, B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-218 TO -220

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, (QI), RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, ~~3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

___ 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 (Replace Brake / Modify MVA)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action by ~~EB~~ Third quarter 1982 (820930).)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	X
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 666

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.8.2 Motor Operators With Brakes

	WORKSHEET PAGE NO.
MOV-2890A	6-218
MOV-2890B	9-219
MOV-2890C	6-220
MOV-2115B	6-13
MOV-2115D	6-15
MOV-2863A	6-208
MOV-2863B	6-209
MOV-2864A	6-231
MOV-2864B	6-232

7.2.8.2.1 Modification/Replacement Status

The valves listed above are addressed by Franklin Institute Research Laboratories Report F-C3271, which does not include radiation data. If the brakes are removed, the vendor has informed us that the valves will be qualified by their Qualification Report B0003. Therefore, the brakes will be removed from the motor operated valves.

7.2.8.2.2 Modification Replacement Schedule

VEPCO is currently reviewing two methods of qualification. One requires modification to the existing valve and the other requires complete actuator replacement. Our current projections indicate that if complete replacement is required, material availability will allow replacement to start during the third quarter of 1982.

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.8.2.3 Justification For Continued Operation

Review of the available qualification documents, some dating back to the time at which Surry was built, indicates that valve actuators with parts similar to those slated for replacement were demonstrated by test and analysis, to be capable of functioning in the harsh environments more severe than that expected in Surry following DBA/HELB. Also no failures of any significance were experienced during these tests to indicate a potential for common mode failures. In these tests, the valve actuators included motor brakes that are similar in con- struction to those used in the Surry design. These tests included multicycle open/close operation prior to, during, and after entire DBA test sequence. The motor brakes performed satisfactorily in each of the eleven operational cycles thorughout the program's six days of test duration. These tests, however, did not include irradiation. Since these atuators are located outside the containment, the normal operating radiation dose to these actuators is minimal. These actuators are accessible for frequent inspections, tests, and maintenance. Further, even during post DBA/HELB conditions, these valves can be operated using manual handwheels independent of the brakes.

On the basis of the above it is concluded that continued plant operation in the interim with these equipment lacking substantiation of their environmental qualification will have little or no impact on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

EQUIPMENT ITEM NO. 67
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
LIMITORQUE MODEL SMB00
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 67
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): BORON INJECTION TANK BYPASS (MOV-2869B)
LICENSEE SUBMITTAL: SCEW(S): 6-323A

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	7~~a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	____
II.a	Equipment Qualification Not Established	____
II.b	Equipment Not Qualified	____
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	____
III.a	Equipment Exempt From Qualification	____
III.b	Equipment Not in the Scope of the Qualification Review	____
IV	Documentation Not Made Available	____

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

EQUIPMENT ITEM NO. 68
MOTORIZED VALVE ACTUATOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
LIMITORQUE, MODEL NOT STATED, PEERLESS MOTOR, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 68
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION PUMP RECIRCULATION (MOV-2885A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-232B, C, D

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 68

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

_X_ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

EQUIPMENT ITEM NO. 69
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (AB-13A)(S)
LIMITORQUE MODEL SMB00
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 69
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION DISCHARGE (MOV-2863A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-208, -209

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT) RT, P, H, CS, (A,) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Summary of Licensee Responses to the NRC SER	1b
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Licensee Response to NRC SER	3a, 3b, 3c, ~~3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - ___ 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 (Replace Brake/Modify MVA)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action by Third quarter 1982 (820930).)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
[I.b Modification]	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	X
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 69

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.8.2 Motor Operators With Brakes

WORKSHEET PAGE NO.	
MOV-2890A	6-218
MOV-2890B	9-219
MOV-2890C	6-220
MOV-2115B	6-13
MOV-2115D	6-15
MOV-2863A	6-208
MOV-2863B	6-209
MOV-2864A	6-231
MOV-2864B	6-232

7.2.8.2.1 Modification/Replacement Status

The valves listed above are addressed by Franklin Institute Research Laboratories Report F-C3271, which does not include radiation data. If the brakes are removed, the vendor has informed us that the valves will be qualified by their Qualification Report B0003. Therefore, the brakes will be removed from the motor operated valves.

7.2.8.2.2 Modification Replacement Schedule

VEPCO is currently reviewing two methods of qualification. One requires modification to the existing valve and the other requires complete actuator replacement. Our current projections indicate that if complete replacement is required, material availability will allow replacement to start during the third quarter of 1982.

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.8.2.3 Justification For Continued Operation

Review of the available qualification documents, some dating back to the time at which Surry was built, indicates that valve actuators with parts similar to those slated for replacement were demonstrated by test and analysis, to be capable of functioning in the harsh environments more severe than that expected in Surry following DBA/HELB. Also no failures of any significance were experienced during these tests to indicate a potential for common mode failures. In these tests, the valve actuators included motor brakes that are similar in con- struction to those used in the Surry design. These tests included multicycle open/close operation prior to, during, and after entire DBA test sequence. The motor brakes performed satisfactorily in each of the eleven operational cycles thorughout the program's six days of test duration. These tests, however, did not include irradiation. Since these atuators are located outside the containment, the normal operating radiation dose to these actuators is minimal. These actuators are accessible for frequent inspections, tests, and maintenance. Further, even during post DBA/HELB conditions, these valves can be operated using manual handwheels independent of the brakes.

On the basis of the above it is concluded that continued plant operation in the interim with these equipment lacking substantiation of their environmental qualification will have little or no impact on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

EQUIPMENT ITEM NO. 70
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT, INSIDE CRANEWALL, SUBMERGED (RC-3A)
LIMITORQUE MODEL SMB3
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 70
LICENSEE REFERENCE(S): 45
FUNCTION (PLANT ID): ACCUMULATOR ISOLATION (MOV-2865A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-210, -211, -212

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated,) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	4a, 4b, ~~4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- ___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- ___ Corrective action specified by the Licensee:
  - ___ Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- ___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a Exempt)
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See Evaluation on Pages 4a & b

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

_____ (1) COMPONENTS DELETED FROM THE MASTER LIST

_____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

_____ (3) COMPONENTS DETERMINED TO RE QUALIFIED

_____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.3.9 Motor Operated Valves (Safety Injection)

MOV-2865A
MOV-2865B
MOV-2865C

These valves serve to isolate the safety injection accumulator tanks during refueling. They are administratively locked open for critical operations by locking out the breakers that supply power to these valves. Thus, the valves will remain in their required open position to mitigate an LOCA or MSLB.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/ ~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 70

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

___ Other (see page___)

X Resultant NRC Qualification Evaluation Category (IIIa/~~IIIb~~)

___ Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page_____)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3b of this checksheet.

EVALUATION OF LICENSEE STATEMENT

These valves are locked in their required accident mitigating position with the power removed (breaker locked open). These valves are exempt from qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

EQUIPMENT ITEM NO. 71
MOTORIZED VALVE ACTUATOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
LIMITORQUE MODEL SMC04
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 71
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): RECIRCULATION SPRAY PUMP DISCHARGE (MOV-RS-256A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-171, -172

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 71

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

EQUIPMENT ITEM NO. 72
MOTORIZED VALVE ACTUATOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 72
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): CHILLED WATER VALVE CONTROL ROOM HVAC (MOV-PG-107A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-84, -85, -86

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QV), (RT), P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, ~~5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	X
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; NUREG-0588, Cat. I___; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	MVA	Motorized Valve Actuator	
Manufacturer's Name (5.2.2/-/-)	LIMITORQUE	Limitorque	
Model Number (5.2.2/-/-)	SMB; Size 000	SMB-0	
Serial Number	NOTE 1	195004	NOTE 1
Features/Mounting (5.2.6/-/-)	See Pg. 1a & NOTE 2	Reliance AC Motor Class B Insulation also Electric Apparatus Motor with Class B Insulation	NOTE 2, 7
Connections/Interfaces (5.2.6/-/-)	NOTE 3	Not Stated	NOTE 3
Location/Elevation	mech. Equip. Rm # 3 (SB-9B)	Not Applicable	
Equipment ID No.	MOV-PG-107A, B, C	Not Applicable	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	—	B0003	
Report Date	—	June 1976	
Issued by	—	Limitorque Corporation	
Prepared for	—	Limitorque	
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)	—	Cycling/Insulation Resistance	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.	NOTE 4	Not Applicable	NOTE 4

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	—	Not Stated	
Accuracy (5.2.5/-/-)	—	Not Applicable	
Number of Specimens	—	1 Actuator + 2 Motors	
Test Instruments Calibrated	—	Yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	ACTIVE	Not Applicable	
Test Duration (5.2.1/-/-)	—	16 Days	NOTE 5
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	1 hour	Not Applicable	
Required Function Time	120 days	Not Applicable	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	—	Thermal Aging Mechanical Cycling Radiation Exposure Seismic Aging LOCA Simulation	
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		Not Applicable	
Aging (5.2.4, 7.0/4.0/4.0)	120°F/40 years (design)		NOTE 6
Thermal Aging/Basis		199.8 hrs @ 165°F/100%RH	
Material Aging Evaluation (7.0/-/-)	NOTE 6	Not Applicable	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	—	Not Stated	
Radiation Aging, Type	GAMMA	Gamma	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	2.5×10^3 rd	See Accident Dose	
Radiation Aging, Dose Rate	—	See Accident Dose	
Radiation Aging, Method	—	Test	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	—	Not Stated	
Operational Aging (-/4.2/-)	—	2000 cycles at rated Load	
Other Age Conditioning (-/4.2/-)	—	Seismic	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	4 yr/40 yr	40 Years outside containment	
Normal Ambient Temperature	120°F	Not Applicable	
Normal Ambient Radiation*	0.71 mR/hr	Not Applicable	
Normal Ambient Humidity **	20-90%	Not Applicable	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	yes	Not Applicable	
On-Going Analysis of Failures and Degradation (7.0/-/-)	yes	Not Applicable	
Margin (General) (6.0/3.0/3.0)	—	Not Stated	
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)		Not Applicable	

* $\left(\frac{2.5 \times 10^3 \text{ rd}}{40 \text{ yr}}\right) \Big/ \left(\frac{8760 \text{ hr}}{\text{yr}}\right) = 0.71 \text{ mR/hr}$

** ASSUMED BY FRC

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

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)	HELB	LOCA/HELB outside Containment	
Radiation Type	GAMMA	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	2.5×10^3 rd	2×10^7 (Complete Actuator) 2.04×10^8 (2 Motors)	
Radiation Dose Rate (rd/hr)	—	1 Mrd/hr	
Radiation Qual. Method (5.3.1/-/-)	—	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/-/-)	—	No	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	5.0×10^3 rd	Not Applicable	
Plateout Dose Considered (-/1.48/1.48)	—	Not Applicable	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	—	Not Applicable	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase	UNKNOWN (NO PROFILE shown)	13°F, 2.5psi/sec	
Peak: °F/psig/RH/Time	310/14.9/100	250/25/100/24 hrs	X - NOTE 8
Decrease To: °F/psig/RH/Time	310-30min. 130/14.9/100	200/10/100/15 days	
Decrease To: °F/psig/RH/Time	30 m - 1 hr. 130-120/14.9/100/>1 hr.		
Decrease To: °F/psig/RH/Time			
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	—	Not Applicable	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	N/A	Not Applicable Outside Containment application	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)		Not Applicable	
Spray Density (gpm/ft^2)		Not Applicable	
Spray Duration		Not Applicable	
Submergence Duration (4.1.3/2.2.5/2.2.5)	NOT REQUIRED	Not Applicable	
In-Leakage Considered (5.2.6, 5.3.2/-/-)		Not Stated but none apparent in photographs	
Time to Submergence		Not Applicable	
Dust Environment (-/2.2.11/2.2.11)	—	Not Applicable	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

NOTES:

1. Serial numbers are provided in PSR # 29 on the "walk-down" sheets
2. For most motorized valve actuators (MVAs) the motor manufacturer, class of insulation and whether or not the MVA has a motor-brake assembly has been identified in PSR 29 and on the SCEW(s)
3. The component interfaces (i.e. motor leads, splices) are not considered part of the MVA by the licensee, but will be addressed separately.
4. The nameplate operating conditions for the MVA (and brakes where applicable) are provided in PSR # 29 on the "walk-down" sheets.
5. For the equipment located outside containment, a required operating time of 120 days is specified. The test lasted only 16 days. PSR # 29 has attempted to extrapolate the qualified duration by using the Arrhenius technique and the elevated, saturated steam conditions reported in PGR # 662 (B0003). The following

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

NOTES:

is noted with respect to this application of the Arrhenius Technique.

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 justifying 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 by oxidation--when exposed to elevated temperatures in the presence of air. 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 as an aging procedure. In addition, the Arrhenius 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 anomalies 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.

Though the licensee has not provided this technical basis, it is noted that the MVA tested showed no indication that exposure to continued post-accident conditions would result in a failure of

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

NOTES:

The device. As such, this MVA is considered qualified for the specified operating time.

6. Thermal aging has been addressed in the BOP58 report for the motor insulation and is acceptable. The licensee has also addressed seals, gaskets (Not required for absolute sealing) & lubricants. The limit and torque switches are generally made of a phenolic material and would generally not experience significant thermal degradation. The licensee has also stated that the interfaces will be address as separate items. The licensee should be aware that teflon is used in many motor leads as insulation and is susceptible to thermal and radiation degradation. The licensee has also addressed terminal strips (blocks) and connectors in this review. All information reviewed is acceptable.

7. The difference in motor manufacturers has been adequately addressed.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 72

NOTES:

8. The peak accident temperature exceeds the qualified peak temperature. The licensee has not addressed this problem in PSR # 29. Heat transfer analyses have shown the MVA temperature rising above the 250°F peak in only several minutes on similar transients.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

EQUIPMENT ITEM NO. 73
ELECTRICAL CABLE, CONTROL LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
CERRO WIRE AND CABLE MODEL PYROTROL III
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 73
LICENSEE REFERENCE(S): 676
FUNCTION (PLANT ID): 1000V CONTROL CABLE (NUS-362 S.N.-1246; NUS-381E S.N.-1447/1246; NUS-381C S.N.-446; NUS-325 SN-246)
LICENSEE SUBMITTAL: SCEW(S): 6-42A, -39, -38, -37

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), (T), (QT), RT, (P), H, (CS), (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f, 5g, 5h, 5i, ~~5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a Qualification Not Established)
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	X
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

NOTES:

The Licensee has not established that the test report can be applied to the installed Cables. This is particularly important for Cross Linked Polyethylene where thickness is a major factor in establishing adequate cross linking. If radiation cross linked, then the thickness determines electron energy, beam current and speed of advance of the cable during manufacture. Therefore, qualification of one thickness of insulation cannot be used to establish qualification of any other thickness unless similarity of the molecular structure of the cable insulation can be established. For thick insulations, i.e. greater than 60 mils, space charge effects are often observed which preclude proper creoss linking. For chemically cross linked insulation, processing time and temperatures are critical factors and differ significantly for different insulation thicknesses. Again, unless similarity of molecular structure can be established, use of test reports for different thicknesses is not technically justified.

The Licensee stated:

Form QDR-3/01/80 Sheet 1
Client ID: Virginia Electric & Power Company QDR-5437-118-01
Plant: Surry Unit 2

Qualification Document Review Checklist

Review for: DOR Guidelines [X] NUREG-0588 [ ]

1. Name of the Reviewer: C.J. Endlich Date: 7/7/81
2. Equipment Covered: 600V. Control Cable, XLPE Insulation, Neoprene Jacket (Cerro Wire & Cable Co.)
3. Equipment Tag No(s).: N/A (See Spec. MAS-120)

		YES	NO	NA	Page Ref.
4.	Does the report address all of the Class IE equipment in this category listed in the master IE equipment list?		X		See Attachment #1
*5.	Is the report traceable to the plant equipment?		X		See Attachment #1
*6.	Does the report specify an acceptance criteria for equipment performance?	X			Rpt. 94 Pyrotrol III, See attachment #1

NOTES:

Attachment #1 to QDR-5437-118-01

Additional Information/Classifications/Justifications

1) Question No. 4

NUS evaluated the test specimen cited in the test report against those types of cables used in the Surry Power Plant Units 1 and 2 and determined this report to be adequate in establishing qualification of the following cable with XLPE insulation and neoprene jacket used in the Surry Plants:

Type and Size	Insul. Thickness	Jacket Thickness
1/C #14	30 mils	15 mils
2/C #14	30 mils	45 mils
3/C #14	30 mils	45 mils
5/C #14	30 mils	45 mils
7/C #14	30 mils	60 mils
9/C #14	30 mils	60 mils
12/C #14	30 mils	60 mils
1/C #12	30 mils	15 mils
2/C #12	30 mils	45 mils
4/C #12	30 mils	45 mils
7/C #12	30 mils	60 mils
4/C #10	30 mils	60 mils
2/C #8	45 mils	60 mils
2/C #6	45 mils	60 mils
4/C #6	45 mils	80 mils
7/C #6	45 mils	80 mils
2/C #4	45 mils	80 mils
4/C #4	45 mils	80 mils
2/C #2	45 mils	80 mils

2) Question No. 5

NUS compared the insulation system of the test specimen in the test report versus the insulation system of the cables specified for use in the plant and determined that this report is applicable for establishing qualification status of the cables cited in item 1, above.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

NOTES:

Requirements for establishing similarity between installed and tested cables are contained in the DOR Guidelines and IEEE 383-74 which are reproduced below for convenience.

2. Test Specimen - The test specimen should be the same model as the equipment being qualified. The type test should only be considered valid for equipment identical in design and material construction to the test specimen. Any deviations should be evaluated as part of the qualification documentation (see also Section 8.0 below).

[DOR]

IEEE-383

1.3.1 *Cable Description.* This description or specification should include as a minimum:

1.3.1.1 Conductor — material identification, size, stranding, coating.

1.3.1.2 Insulation — material identification, thickness, method of application.

1.3.1.3 Assembly (multiconductor cables only) — number and arrangement of conductors, fillers, binders.

1.3.1.4 Shielding — tapes, extrusions, braids, or others.

1.3.1.5 Covering — jacket or metallic armor or both, material identification, thickness, method of application.

1.3.1.6 Characteristics — voltage and temperature rating (normal and emergency). For instrumentation cables — capacitance, attenuation, characteristic impedance, microphonics, insulation resistance, as applicable.

1.3.1.7 Identification — manufacturer's trade name, catalog number.

1.3.2 *Field Splice or Connection Description or Both.* This description or specification should include as a minimum:

1.3.2.1 Whether factory or field assembled to cable.

1.3.2.2 Conductor connection — type, material identification, and method of assembly.

1.3.2.3 Items from Sections 1.3.1.2 through 1.3.1.7.

2.2 Type Test Samples. The samples tested should contain the conductor, insulation, fillers, jacket, binder tape, overall jacket, shielding, and field splices which are representative of the cable category being qualified. Table 1 lists sizes which have been considered representative of these categories. The sample lengths should be sufficient to permit reliable test readings and evaluation consistent with good testing practice.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 73

NOTES:

Table 1
Representative Cables for Type Tests

Type	Test	Section	Size
Up to 2000 V multiconductor control cable or Shielded multiconductor signal cable (see list below for individual component) or Single conductor power cable	temperature and moisture resistance	2.3.1	1/C — 14 or 12 AWG
	thermal and radiation exposure	2.3.3	1/C or M/C — 14 or 12 AWG
	design basis event simulation	2.4	1/C or M/C — 14 or 12 AWG 1/C — 6, 4 or 2 AWG
	vertical flame test singles from cable assembly	2.5.6	1/C — 14 or 12 AWG
	vertical tray flame test	2.5.4	7/C — 16, 14 or 12 AWG
Shielded pairs, triple or quad from multiconductor signal cable	temperature and moisture resistance	2.3.1	1 pair shielded 16 AWG or actual cable
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test	2.5.6	
Coaxial, triaxial or special instrument cable	temperature and moisture resistance	2.3.1	actual size
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical flame test singles from cable assembly	2.5.6	
Single pair thermocouple extension cable	temperature and moisture resistance	2.3.1	2/C — 20 AWG or actual size if smaller
	thermal and radiation exposure	2.3.3	
	design basis event simulation	2.4	
	vertical tray flame test	2.5.4	
	vertical flame test singles from cable assembly	2.5.6	
2001–15 000 V power cable 1/C triplexed and multiconductor	vertical tray flame test	2.5.4	6 AWG (2.5kV) 2/O or 4/O or 4/O (2.15kV)

In Lieu of the detailed description discussed above it would be acceptable for the licensee to obtain certification from the maunfacturer identifying what test report(s) apply to the cables furnished for installation provided these reports adequately establish qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

EQUIPMENT ITEM NO. 74
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT SPRAY PUMP HOUSE BELOW EL. 27'6" (CSPH-11)
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 74
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): CHEMICAL ADDITION TANK ISOLATION (MOV-CS-202B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-77, -76

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	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	____

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 74

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

EQUIPMENT ITEM NO. 75
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT SPRAY PUMP HOUSE (CSPH-27)
LIMITORQUE MODEL SMC04
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 75
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): AIR TO BLOWDOWN TRIP VALVE (MOV-CS-201D)
LICENSEE SUBMITTAL: SCEW(S): 6-75
FUNCTION (PLANT ID): SPRAY PUMP DISCHARGE ISOLATION (MOV-CS-201C, B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-74, -73, -72

DESIGNATION 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~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	____
II.a	Equipment Qualification Not Established	____
II.b	Equipment Not Qualified	____
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	____
III.a	Equipment Exempt From Qualification	____
III.b	Equipment Not in the Scope of the Qualification Review	____
IV	Documentation Not Made Available	____

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 75

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

EQUIPMENT ITEM NO. 76
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING CHARGING PUMP CUBICLE (AB-2C)
LIMITORQUE MODEL SMB, CLASS B INSULATION, SIZES 00, 000; WITH MOTOR-BRAKE ASSEMBLY
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 76
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): CHARGING SUMP SUCTION FROM REFUELING WATER STORAGE TANK (MOV-2115D, B)
LICENSEE SUBMITTAL: SCEW(S): 6-15, -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,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, ~~3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - ___ 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 (Replace brake/ modify MVA)
- ___ 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 by third quarter 1982 (820930).)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	X
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 76

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO RE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.8.2 Motor Operators With Brakes

WORKSHEET PAGE NO.	
MOV-2890A	6-218
MOV-2890B	9-219
MOV-2890C	6-220
MOV-2115B	6-13
MOV-2115D	6-15
MOV-2863A	6-208
MOV-2863B	6-209
MOV-2864A	6-231
MOV-2864B	6-232

7.2.8.2.1 Modification/Replacement Status

The valves listed above are addressed by Franklin Institute Research Laboratories Report F-C3271, which does not include radiation data. If the brakes are removed, the vendor has informed us that the valves will be qualified by their Qualification Report B0003. Therefore, the brakes will be removed from the motor operated valves.

7.2.8.2.2 Modification Replacement Schedule

VEPCO is currently reviewing two methods of qualification. One requires modification to the existing valve and the other requires complete actuator replacement. Our current projections indicate that if complete replacement is required, material availability will allow replacement to start during the third quarter of 1982.

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.8.2.3 Justification For Continued Operation

Review of the available qualification documents, some dating back to the time at which Surry was built, indicates that valve actuators with parts similar to those slated for replacement were demonstrated by test and analysis, to be capable of functioning in the harsh environments more severe than that expected in Surry following DBA/HELB. Also no failures of any significance were experienced during these tests to indicate a potential for common mode failures. In these tests, the valve actuators included motor brakes that are similar in con- struction to those used in the Surry design. These tests included multicycle open/close operation prior to, during, and after entire DBA test sequence. The motor brakes performed satisfactorily in each of the eleven operational cycles thorughout the program's six days of test duration. These tests, however, did not include irradiation. Since these atuators are located outside the containment, the normal operating radiation dose to these actuators is minimal. These actuators are accessible for frequent inspections, tests, and maintenance. Further, even during post DBA/HELB conditions, these valves can be operated using manual handwheels independent of the brakes.

On the basis of the above it is concluded that continued plant operation in the interim with these equipment lacking substantiation of their environmental qualification will have little or no impact on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

EQUIPMENT ITEM NO. 77
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
LIMITORQUE, MODEL NOT STATED, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 77
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): REACTOR COOLING PUMP SEAL WATER RETURN (MOV-2381)
LICENSEE SUBMITTAL: SCEW(S): 6-6

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.
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Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	____
II.a	Equipment Qualification Not Established	____
II.b	Equipment Not Qualified	____
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	____
III.a	Equipment Exempt From Qualification	____
III.b	Equipment Not in the Scope of the Qualification Review	____
IV	Documentation Not Made Available	____

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 77

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

EQUIPMENT ITEM NO. 78
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL
ASCO MODEL NP8320179E
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 78
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): OUTSIDE BLOWDOWN TRIP VALVE (SOV-BD-200A)
LICENSEE SUBMITTAL: SCEW(S): 6-260
FUNCTION (PLANT ID): AIR TO BLOWDOWN TRIP VALVE (SOV-BD-200C)
LICENSEE SUBMITTAL: SCEW(S): 6-262

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, (CS), (A), S, (R), (M), I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a	Qualified	II.c	Qualified Life Deficiency
(I.b)	Modification	III.a	Exempt
II.a	Qualification Not Established	III.b	Not in Scope
II.b	Not Qualified	IV	Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 78

NOTES:

The Licensee has identified this equipment as the ASCO NP series valve and has stated that these valves were scheduled for replacement during the last quarter of 1981. The Licensee should identify the installed valves and the qualification documentation that applies if the NP-series valves are installed

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

EQUIPMENT ITEM NO. 79
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO, MODEL NOT STATED
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 79
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): AIR TO BLOWDOWN TRIP VALVE (SOV-BD-200B)
LICENSEE SUBMITTAL: SCEW(S): 6-261

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.
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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~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 79

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

EQUIPMENT ITEM NO. 80
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 8320A102
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 80
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): AIR TO BLOWDOWN TRIP VALVE (SOV-BD-200D, F)
LICENSEE SUBMITTAL: SCEW(S): 6-263, -265
FUNCTION (PLANT ID): CONTAINMENT INSTRUMENT AIR COMPRESSOR SUCTION (SOV-IA-201B)
LICENSEE SUBMITTAL: SCEW(S): 6-127

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, (RPN), EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b~~ ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/[redacted]) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/[redacted]) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/[redacted]) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 80

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	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. 80

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

EQUIPMENT ITEM NO. 81
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL
ASCO MODEL NP8320A179V
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 81
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT INSTRUMENT AIR COMPRESSOR SUCTION (SOV-BD-200E)
LICENSEE SUBMITTAL: SCEW(S): 6-264

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT) RT, P, H, (CS) (A) S, (R), (M) I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 81

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Mutual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoids will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

EQUIPMENT ITEM NO. 82
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ASCO MODEL 2068323RF
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 82
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER LIQUID SPACE SAMPLE (SOV-SS-200A1, 201A1)
LICENSEE SUBMITTAL: SCEW(S): 6-233, -235
FUNCTION (PLANT ID): PRESSURIZER RELIEF TANK SAMPLE (SOV-SS-204A)
LICENSEE SUBMITTAL: SCEW(S): 6-240
FUNCTION (PLANT ID): PRIMARY COOLANT HOT LEG SAMPLE (SOV-SS-206A)
LICENSEE SUBMITTAL: SCEW(S): 6-242

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, (CS), (A), S, (R), (M), I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 82

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

EQUIPMENT ITEM NO. 83
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 830281RF
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 83
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER LIQUID SPACE SAMPLE (SOV-SS-200B1)
LICENSEE SUBMITTAL: SCEW(S): 6-234
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG SAMPLE (SOV-SS-202B1)
LICENSEE SUBMITTAL: SCEW(S): 6-238
FUNCTION (PLANT ID): RESIDUAL HEAT REMOVAL SAMPLE (SOV-SS-203)
LICENSEE SUBMITTAL: SCEW(S): 6-239
FUNCTION (PLANT ID): PRESSURE RELIEF TANK SAMPLE (SOV-SS-204B)
LICENSEE SUBMITTAL: SCEW(S): 6-241
FUNCTION (PLANT ID): PRIMARY COOLANT HOT LEG SAMPLE (SOV-SS-206B)
LICENSEE SUBMITTAL: SCEW(S): 6-243

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) T, (QT) RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 83

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

EQUIPMENT ITEM NO. 84
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 206823RF
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 84
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER VAPOR SPACE (SOV-SS-201B1)
LICENSEE SUBMITTAL: SCEW(S): 6-236
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG SAMPLE (SOV-SS-202A1)
LICENSEE SUBMITTAL: SCEW(S): 6-237

DESIGNATION 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	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f~~, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a	Qualified	II.c	Qualified Life Deficiency
(I.b)	Modification	III.a	Exempt
II.a	Qualification Not Established	III.b	Not in Scope
II.b	Not Qualified	IV	Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 84

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

EQUIPMENT ITEM NO. 85
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 8320A102
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 85
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): NITROGEN SUPPLY (SOV-SI-200)
LICENSEE SUBMITTAL: SCEW(S): 6-221
FUNCTION (PLANT ID): NITROGEN RELIEF (SOV-SI-201B)
LICENSEE SUBMITTAL: SCEW(S): 6-223
FUNCTION (PLANT ID): REACTOR CONTAINMENT SUMP PUMP DISCHARGE (SOV-DA-200B)
LICENSEE SUBMITTAL: SCEW(S): 6-174
FUNCTION (PLANT ID): RADIATION MONITORING TRIP VALVE (SOV-RM-200B)
LICENSEE SUBMITTAL: SCEW(S): 6-179
FUNCTION (PLANT ID): COOLING WATER RETURN FROM RESIDUAL HEAT EXCHANGER ISOLATION (SOV-CC-209A)
LICENSEE SUBMITTAL: SCEW(S): 6-67

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) T, (QT) RT, P, H, CS, (A) S, (R), M, I, QM, (RPN) EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 85

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

EQUIPMENT ITEM NO. 86
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ASCO, MODEL NOT STATED
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 86
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): NITROGEN RELIEF (SOV-SI-201A)
LICENSEE SUBMITTAL: SCEW(S): 6-222
FUNCTION (PLANT ID): REACTOR CONTAINMENT PUMP DISCHARGE (SOV-DA-200A)
LICENSEE SUBMITTAL: SCEW(S): 6-173
FUNCTION (PLANT ID): PRIMARY DRAIN TRANSFER TANK VENT (SOV-VG-209A)
LICENSEE SUBMITTAL: SCEW(S): 6-177
FUNCTION (PLANT ID): RADIATION MONITORING TRIP VALVE (SOV-RM-200C)
LICENSEE SUBMITTAL: SCEW(S): 6-180

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT) RT, P, H, (CS) (A), S, (R), (M) I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 86

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

EQUIPMENT ITEM NO. 87
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING CHARGING PUMP CUBICLE (AB-2C)
ASCO MODEL 8302C4U
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 87
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG (SOV-SI-202A1, B1)
LICENSEE SUBMITTAL: SCEW(S): 6-224, -226
FUNCTION (PLANT ID): REFUELING WATER STORAGE TANK CROSS CONNECT (SOV-SI-202A2, B2)
LICENSEE SUBMITTAL: SCEW(S): 6-225, -227

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) T, (QT) RT, P, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	4a, ~~4b~~; ~~4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a) Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.3.15 Solenoid Operated Valves (Safety Injection)

SOV-SI-202A1
SOV-SI-202A2
SOV-SI-202B1
SOV-SI-202B2

These valves serve to cross-connect the LHSI suction line from the Refueling Water Storage Tank (RWSI) in Unit 1, to supply the LHSI pump suctions for Unit 2. If an HELB occurs in the MSVH for Unit 2 (Location of LHSI line from the RWST of (Unit 2), these valves can be operated to put the RWST of Unit 1 on service. Due to the location of these valves, these valves will not see the effects of an HELB in Unit two's main steam valve house. Thus, these valves have been deleted.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 87

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)

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)

X Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

___ Other (see page___)

___ Resultant NRC Qualification Evaluation Category (IIIa/IIIb)

X Note 1: The Licensee ~~(did~~ has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page 3b)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

EQUIPMENT ITEM NO. 88
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL LB831654
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 88
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): BORON INJECTION TANK RECIRCULATION (SOV-2884A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-228 TO -230

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, (RPN), EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 88

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO RE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

EQUIPMENT ITEM NO. 89
SOLENOID VALVE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-47A)
ASCO, MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 89
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER POWER OPERATED RELIEF (SOV-2455C-1, -2; -2456-1, -2)
LICENSEE SUBMITTAL: SCEW(S): 6-200C, D, F, G

DESIGNATION 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~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 89

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

EQUIPMENT ITEM NO. 90
SOLENOID VALVE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-47A)
LAWRENCE MODEL 3300WA742DC
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 90
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER POWER OPERATED RELIEF (SOV-2445SC-3, -2456-3)
LICENSEE SUBMITTAL: SCEW(S): 6-200E, H

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) (T) (QT) RT, (P) (H) (CS) (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

X Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b) Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 90

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

EQUIPMENT ITEM NO. 91
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ASCO MODEL HBX8320A12
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 91
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): NITROGEN SUPPLY LINE (SOV-DG-208A)
LICENSEE SUBMITTAL: SCEW(S): 6-175
FUNCTION (PLANT ID): CONTAINMENT VACUUM PUMP TRIP VALVE (SOV-CV-250A)
LICENSEE SUBMITTAL: SCEW(S): 6-80

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) (T) (QT) RT, (P) (H) (CS) (A) S, (R), M, I, QM, (RPN) EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 91

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

EQUIPMENT ITEM NO. 92
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL HBX8320A12
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 92
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY DRAIN TRANSFER PUMP (SOV-DG-208B)
LICENSEE SUBMITTAL: SCEW(S): 6-176
FUNCTION (PLANT ID): RADIATION MONITORING TRIP VALVE (SOV-RM-200A)
LICENSEE SUBMITTAL: SCEW(S): 6-181
FUNCTION (PLANT ID): CONTAINMENT VACUUM PUMP TRIP VALVE (SOV-CV-250C, D, B)
LICENSEE SUBMITTAL: SCEW(S): 6-81 TO -83
FUNCTION (PLANT ID): COMPONENT COOLING FROM CONTAINMENT COOLER (SOV-CC-210C, B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-69 TO -71
FUNCTION (PLANT ID): REACTOR COOLANT PUMP THERMAL BARRIER ISOLATION (SOV-CC-207)
LICENSEE SUBMITTAL: SCEW(S): 6-66
FUNCTION (PLANT ID): REACTOR COOLANT PUMP COOLING WATER ISOLATION (SOV-CC-205C, B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-63 TO -65

DESIGNATION 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	1a
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Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 92

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

EQUIPMENT ITEM NO. 93
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL HT8316C47E
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 93
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MAIN STEAM TRIP VALVE (SOV-MS-201AA, AB, BA, BB)
LICENSEE SUBMITTAL: SCEW(S): 6-160 TO -163

DESIGNATION 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~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 93

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

EQUIPMENT ITEM NO. 94
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL NP8316A76E
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 94
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MAIN STEAM TRIP VALVE (SOV-MS-201CA)
LICENSEE SUBMITTAL: SCEW(S): 6-164

DESIGNATION 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~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 94

NOTES:

The Licensee has identified this equipment as the ASCO NP series valve and has stated that these valves were scheduled for replacement during the last quarter of 1981. The Licensee should identify the installed valves and the qualification documentation that applies if the NP-series valves are installed

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

EQUIPMENT ITEM NO. 95
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL HT8316CE7E
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 95
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MAIN STEAM TRIP VALVE (SOV-MS-201CB)
LICENSEE SUBMITTAL: SCEW(S): 6-165

DESIGNATION 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~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 95

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety funct.on when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

EQUIPMENT ITEM NO. 96
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL NP8320A174E
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 96
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY GRADE WATER TO PRESSURIZER RELIEF TANK (SOV-2519A)
LICENSEE SUBMITTAL: SCEW(S): 6-200

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, Q, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO RE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 96

NOTES:

The Licensee has identified this equipment as the ASCO NP series valve and has stated that these valves were scheduled for replacement during the last quarter of 1981. The Licensee should identify the installed valves and the qualification documentation that applies if the NP-series valves are installed

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

EQUIPMENT ITEM NO. 97
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 80174
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 97
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY DRAIN TRANSFER TANK VENT (SOV-VG-209B)
LICENSEE SUBMITTAL: SCEW(S): 6-178

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) T, (QT) RT, P, H, CS, (A) S, (R), M, I, QM, (RPN) EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 97

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 98

EQUIPMENT ITEM NO. 98
SOLENOID VALVE LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-27)
ASCO MODEL 80147
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 98
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MAIN STEAM LINE DRAINS TO CONDENSER (SOV-MS-209, -210)
LICENSEE SUBMITTAL: SCEW(S): 6-166, -166A

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.
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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 98

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/[redacted]) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/[redacted]) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/[redacted]) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (has/[redacted]) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b) Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 98

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 98

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO RE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

EQUIPMENT ITEM NO. 99
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING (AB-13)(N)
ASCO MODEL 8320A102
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 99
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT LEAKAGE MONITORING (SOV-LM-200A TO H; 201A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-132 TO -138; -140, -141

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, (RPN), EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 99

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

EQUIPMENT ITEM NO. 100
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL HBX8320A26
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 100
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT INSTRUMENT AIR COMPRESSOR DISCHARGE (SOV-IA-200)
LICENSEE SUBMITTAL: SCEW(S): 6-125

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, (RPN), EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b ~~, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 100

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 101

EQUIPMENT ITEM NO. 101
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ASCO MODEL NP8320A179E
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 101
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): CONTAINMENT INSTRUMENT AIR COMPRESSOR SUCTION (SOV-IA-201A)
LICENSEE SUBMITTAL: SCEW(S): 6-126

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 101

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
(II.c) Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 101

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	X
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	X
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 101

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 101

Checksheets 5a thru 5f have been removed due to the proprietary nature of information contained therein.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 102

EQUIPMENT ITEM NO. 102
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL NP8320A173V
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 102
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): COOLING WATER RETURN FROM RESIDUAL HEAT EXCHANGER ISOLATION (SOV-CC-209B)
LICENSEE SUBMITTAL: SCEW(S): 6-68

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT) RT, D, H, CS, (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b~~ ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ ~~5f~~ ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 102

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b) Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 102

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 102

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO RE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 102

NOTES:

The Licensee has identified this equipment as the ASCO NP series valve and has stated that these valves were scheduled for replacement during the last quarter of 1981. The Licensee should identify the installed valves and the qualification documentation that applies if the NP-series valves are installed

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 103

EQUIPMENT ITEM NO. 103
SOLENOID VALVE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
ASCO MODEL NP831654V
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 103
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): CHEMICAL VOLUME CONTROL SYSTEM ISOLATION VALVE FOR LETDOWN (SOV-2200A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-20 TO -22

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R) (T) (VT) RT, (P) (H) (CS) (A) S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 103

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
(II.c) Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 103

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	X
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	X
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

For evaluation see item 101

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 103

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 104

EQUIPMENT ITEM NO. 104
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 831654
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 104
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): LETDOWN INLET NON-REGENERATIVE HEAT EXCHANGER (SOV-2204)
LICENSEE SUBMITTAL: SCEW(S): 6-19

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.
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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 104

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action, "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 104

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 104

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 105

EQUIPMENT ITEM NO. 105
SOLENOID VALVE LOCATED IN CONTAINMENT, INSIDE CRANEWALL
ASCO MODEL LB831654
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 105
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER AUXILIARY SPRAY ISOLATION (SOV-2311)
LICENSEE SUBMITTAL: SCEW(S): 6-12

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	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	4a, 4b, ~~4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 105

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
(III.a) Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 105

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 105

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

____ (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.3.14 Solenoid Operated Valves (Chemical and Volume Control)

SOV-1311

This valve will not be required during a LOCA because pressure and boration control are not necessary. During an Auxiliary Building HELB, this valve will not be affected, since it is inside containment.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 105

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	Reason for Non-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)	___ 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.
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 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.
___ 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)	___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.
	___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 105

Reason for Concurrence

___ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)

___ Other (see page___)

___ Resultant NRC Qualification Evaluation Category (IIIa/IIIb)

X Note 1: The Licensee ([redacted] has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page 3b)

Reason for Non-Concurrence

___ Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.

___ Backup (equipment/system) is not safety-related.

___ This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.

___ The rationale presented by the Licensee is not supported by objective technical evidence.

___ Other (see page___)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 106

EQUIPMENT ITEM NO. 106
SOLENOID VALVE LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-27)
ASCO MODEL HBX8320A26
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 106
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): AIR REMOVAL TO CONTAINMENT (SOV-SV-202A)
LICENSEE SUBMITTAL: SCEW(S): 6-1

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), T, (QI), RT, P, H, CS, (A), S, (R), M, I, QM, (RPN), EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
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System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 106

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

- X Equipment replacement with qualified equipment
- ___ Equipment modification
- ___ Equipment relocation above submergence level
- ___ Relocate or shield equipment from radiation source
- ___ Verify qualification by additional (testing/analysis)
- ___ Equipment relocation to a mild environment
- ___ Qualification testing of equipment in progress
- ___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action "during the last quarter of 1981".)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 106

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 106

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the last quarter of 1981.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are of NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and severe external environments. They are heat resistant. They are Underwriter's Laboratory listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e. insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will peform their intended safety function when exposed to harsh environments. Therefore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 107

EQUIPMENT ITEM NO. 107
ELECTRICAL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
KAISER MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 107
LICENSEE REFERENCE(S): 3582
FUNCTION (PLANT ID): 600V POWER CABLE (NUS-225 SN-251)
LICENSEE SUBMITTAL: SCEW(S): 6-48

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT) RT, P, H, (CS) (A) S, (R), M, I, (QM) RPN, EXN, SEN, (QI) RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	4a, ~~4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 107

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

X The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 107

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	X
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 107

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

X (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

Kaiser Aluminum and Chemical Sales Inc. (Spec. Nos. NUS 225, NUS 365A, and NUS 217

Based on field test verification (special test 104) obtained subsequent to the February 1980 submittal, it was established that these cables have not been used in safety related applications in Surry Unit No. 1. Therefore, this has been deleted from the Master List.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 107

SYSTEM CONSIDERATION REVIEW

The Licensee has stated that this equipment item does not require environmental qualification and/or should be exempted from qualification. The Licensee's rationale has been evaluated and the reasons for concurrence/~~non-concurrence~~ with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

X Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not required by the DOR Guidelines. (NRC Qualification Evaluation Category IIIa)

___ Equipment is not exposed to a harsh environment by the accident it is intended to mitigate. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIb)

___ Backup (equipment/system) is available which completely performs the safety function. The backup (equipment/system) is environmentally qualified and appears to meet single active failure criterion. See note (1) on page 4b. (NRC Qualification Evaluation Category IIIa)

Reason for Non-Concurrence

___ Backup (equipment/system) is not fully capable of performing the intended safety function or accident mitigating function.

___ Backup (equipment/system) is not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

___ Backup (equipment/system) is subject to a potentially disabling single active failure.

___ Failure of the primary equipment can compromise the ability of other safety-related equipment to perform its specified safety function.

___ Failure of the primary equipment can result in erroneous indication which could mislead an operator.

___ Requirement for continued functioning throughout the post-accident period necessitates environmental qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 108

EQUIPMENT ITEM NO. 108
ELECTRICAL CABLE SPLICE LOCATED IN CONTAINMENT (RC-3A)
MANUFACTURER AND MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 108
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION AND CONTROL
LICENSEE SUBMITTAL: SCEW(S): 6-268

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, QT, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

(Not stated,) Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
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Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment ~~is qualified and/or~~ will function when exposed to the applicable DBE environmental service conditions.

___ 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 (qualify or replace)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (~~has~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 108

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
ation Adequate	
uired Profile Enveloped Adequately	
Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.11 Terminal Blocks and Splices

Terminal blocks and splices of several manufacturers have been utilized in safety related circuits for Surry Units 1 and 2. Documentation to support qualification of all types of terminal blocks and splices has not been assembled.

7.1.11.1 Modification/Replacement Status

VEPCO has undertaken a program (special test 104) to verify model and serial numers of all safety-related equipment on the master list. As a result of the special test effort, many of the terminal blocks and splices have been identified. Information we can gather generically on various manufacturers/types of terminal blocks indicate that most of all types of terminal blocks are qualifiable to meet the DOR guidelines.

Upon completion of our review of the information gathered in the field verification program, qualification packages for all types of installed terminal blocks and splices will be assembled. Where documentation deficiencies cannot be corrected in a cost effective manner, the terminal blocks or splices will be replaced by qualified terminal blocks or splices.

As part of the field verification program, all terminal blocks in safety related circuits located inside containment were replaced with qualified Raychem Splices (WCSF-N).

7.1.11.2 Modification/Replacement Schedule

The field inspection of installed terminal blocks and splices will be finalized to provide specific identification of the installed terminal blocks and splices. This inspetion will be completed by the first quarter of 1982. Upon completion of this inspection, the data will be reviewed to identify any unqualified terminal blocks and splices. A schedule for replacement of any unqualified terminal blocks or splices will be developed by the end of the second quarter of 1982.

LICENSEE RESPONSE TO NRC SER (Continued)

7.1.11.3 Justification for Continued Operation

The terminal blocks and splices that exist in the plant have been specified and installed in strict accordance with established power industry practices. These terminal blocks and splices have a history of reliability and satisfactory performance under similar opeating conditions.

On the basis of the above, it is reasonable to conclude that these terminal blocks and splices will perform their intended safety function when exposed to harsh environments. Therefore, continued operation of the Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 109

EQUIPMENT ITEM NO. 109
MOTORIZED VALVE ACTUATOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
LIMITORQUE MODEL H2BC, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 109
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION SUCTION (MOV-2862B)
LICENSEE SUBMITTAL: SCEW(S): 6-207

DESIGNATION 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	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 109

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____ ___)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 109

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 109

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

_X_ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 110

EQUIPMENT ITEM NO. 110
MOTORIZED VALVE ACTUATOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
LIMITORQUE MODEL SMB, CLASS B INSULATION, SIZES 00, 000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 110
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): RECIRCULATION SPRAY PUMP SUCTION (MOV-RS-255B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-170, -169
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION RECIRCULATION WATER (MOV-2860B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-205, -204
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION SUCTION FROM REACTOR WATER STORAGE TANK (MOV-2862A)
LICENSEE SUBMITTAL: SCEW(S): 6-206
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION PUMP RECIRCULATION (MOV-2885D)
LICENSEE SUBMITTAL: SCEW(S): 6-232E

DESIGNATION 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

MOV-2885D only

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 110

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 110

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 111

EQUIPMENT ITEM NO. 111
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
LIMITORQUE MODEL SMB 00, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 111
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): BORIC ACID INJECTION TANK OUTLET VALVE (MOV-2842, -2867B, C, D)
LICENSEE SUBMITTAL: SCEW(S): 6-203, -214 TO -216
FUNCTION (PLANT ID): BORIC ACID INJECTION TANK VALVE (MOV-2867A)
LICENSEE SUBMITTAL: SCEW(S): 6-213
FUNCTION (PLANT ID): SAFETY INJECTION TO REACTOR HOT LEGS ISOLATION (MOV-2869A)
LICENSEE SUBMITTAL: SCEW(S): 6-217
FUNCTION (PLANT ID): CHARGING HEADER ISOLATION VALVE (MOV-2289B)
LICENSEE SUBMITTAL: SCEW(S): 6-18
FUNCTION (PLANT ID): CHARGING TO REGENERATIVE HEAT EXCHANGER STOP VALVE (MOV-2289A)
LICENSEE SUBMITTAL: SCEW(S): 6-17
FUNCTION (PLANT ID): CHARGING PUMP 2-CH-P-1B RECIRCULATION/REFUELING WATER STORAGE TANK HEADER ISOLATION (MOV-2373)
LICENSEE SUBMITTAL: SCEW(S): 6-5

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	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 111

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 111

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 111

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

EQUIPMENT ITEM NO. 112
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-47A)
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 112
LICENSEE REFERENCE(S): 659, 706, 45
FUNCTION (PLANT ID): PRESSURIZER RELIEF BLOCK VALVE (MOV-2535, -2536)
LICENSEE SUBMITTAL: SCEW(S): 6-200A, B

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), (T), (QT), RT, (P), (H), (CS), (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, ~~3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
X Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action by 3rd Quarter 1982 (820930).)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b Modification)
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.8 Limitorque (Motor Operated Valve Actuators)

7.2.8.1 Motor Operators Without Brakes

PLANT ID NO.	WORKSHEET PAGE NO.
MOV-FW251A	6-96
MOV-FW251B	6-97
MOV-FW251C	6-98
MOV-FW251D	6-99
MOV-FW251E	6-100
MOV-FW251F	6-101
MOV-2535	6-196
MOV-2536	6-197

7.2.8.1.1 Modification/Replacement Status

Additional vendor qualification documentation comprised of a listing of the special operator features (e.g., actuator motor, limit switch and torque switches, insulating and housing materials, splices, etc., used in the various vendor qualification tests was received. For each MOV with incomplete qualification data, we conducted a field inspection to determine the existence of any unqualified components. We will replace all unqualified parts with qualified ones.

7.2.8.1.2 Modification/Replacement Schedule

Based on current projections for purchase order placement, material delivery and our present outage schedule, these modifications are scheduled to start during the third quarter of 1982.

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.8.1.3 Justification For Continued Operation

Review of the available qualification documents, some dating back to the time at which Surry was built, indicates that valve actuators with parts similar to those slated for replacement were demonstrated by testing and analysis to be capable of functioning in the harsh environments more severe than that expected in Surry following DBA/HELB.

Also, no failure of any significance were experienced during these tests to indicate a potential for common mode failures. On this basis, it is concluded that continued operation of Surry Units in the interim with this equipment, albeit incomplete in qualification documentation, will have little or no effect on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines X; NUREG-0588, Cat. I__; NUREG-0588, Cat. II __.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	MVA	MOTORIZED VALVE ACTUATOR	
Manufacturer's Name (5.2.2/-/-)	LIMITORQUE	LIMITORQUE	
Model Number (5.2.2/-/-)	SMB; Various sizes	SMB-0	
Serial Number	NOTE 1	189835(O/N 600456-A)	NOTE 1
Features/Mounting (5.2.6/-/-)	NOTE 2	RELIANCE CLASS RH INSUL. MOTOR, ID# 2Y267074A1EZ, TYPE P	NOTE 2, 7
Connections/Interfaces (5.2.6/-/-)	NOTE 3	CONTROL & POWER LEADS THRU FLEXIBLE, PRESSURE-TIGHT CONDUIT	NOTE 3
Location/Elevation	See Pg. 1a	AUTOCLAVE	
Equipment ID No.	See Pg. 1a	——	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	——	600456 (with B-0058)	
Report Date	——	751201	
Issued by	——	LIMITORQUE	
Prepared for	——	LIMITORQUE	
Referenced Reports	——	LOCKHEED 3521-4811	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	——	SIMULTANEOUS AND SEQUENTIAL TEST	
QUALIFICATION TEST PROGRAM			
Functional Test Description (5.2.5/2.2.9/2.2.9)	——	VALVE ACTUATION AND IR MEASUREMENTS	
Operating Conditions (-/2,2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.	NOTE 4	40 ft-#/460 Volts/60 Hz	NOTE 4

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	—	SUCCESSFUL OPERATION OF THE MVA	
Accuracy (5.2.5/-/-)	—	—	
Number of Specimens	—	1 COMPLETE MVA AND 1 ADDITIONAL MOTOR	
Test Instruments Calibrated	—	YES	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	ACTIVE	—	
Test Duration (5.2.1/-/-)	—	30 DAYS	NOTE 5
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	48 hrs.	—	NOTE 5
Required Function Time	120 days	—	NOTE 5
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		YES	
5. Radiation Aging		YES	
6. Wear Aging		YES	
7. Vibration/Seismic		YES	
8. DBE Exposure		YES	
9. Post-DBE Exposure		YES	
10. Inspection		YES	
Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	120°F for 40 years	100 HOURS @ 180 C FOR THE MOTOR STATORS ONLY	NOTE 6
Material Aging Evaluation (7.0/-/-)	NOTE 6	NO	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	—	NOT STATED	
Radiation Aging, Type	GAMMA	GAMMA	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	1.3E07 rd	4 Mrd (COMPLETE UNIT)	
Radiation Aging, Dose Rate	—	1 Mrd/Hr	
Radiation Aging, Method	—	TEST (SEQUENTIAL)	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	—	NOT STATED	
Operational Aging (-/4.2/-)	—	1208 OPEN/CLOSE CYCLES+ 803 (LOCA+POST-LOCA) CYCLES + 2184 CYCLES OF MVA WITH BASE TEST MOTOR INSTALLED	
Other Age Conditioning (-/4.2/-)	—	SEISMIC/VIBRATIONAL	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	40 years/ None	NONE	
Normal Ambient Temperature	120°F	—	
Normal Ambient Radiation*	37.1 R/hr	—	
Normal Ambient Humidity**	20-90%	—	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	yes	—	
On-Going Analysis of Failures and Degradation (7.0/-/-)	yes	—	
Margin (General) (6.0/3.0/3.0)	—	—	
Margin (NUREG-0588, Cat. I) (-/3.2/-)		NOT STATED, EXCEPT FOR THE POST-LOCA ADDITIONAL MVA CYCLING	
1. Temperature (+15°F)		—	
2. Pressure (+10%, 10 psig max)		—	
3. Radiation (not required)		—	
4. Time (+10%, +1 hour + function time minimum)		—	

* $\frac{(1.3E07\ rd)}{40\ yr}\left(\frac{1\ yr}{8760\ hr}\right) = 37.1\ R/hr$

** assumed by FRC

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	LOCA	LOCA	
Radiation Type	GAMMA	GAMMA	
Radiation Dose (rd) (4.1.2/1.4/1.4)	2.4E07rd	200 Mrd	
Radiation Dose Rate (rd/hr)	—	1 Mrd/Hr	
Radiation Qual. Method (5.3.1/-/-)	—	TEST	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	Not Stated	—	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)	—	—	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	3.7E07rd	204 Mrd TOTAL DOSE	
Plateout Dose Considered (-/1.48/1.48)	—	—	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	3.7E07rd	—	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase	26.7°F/sec; 7.5 psig/sec	10F/SEC., 2.5 psig/SEC.	
Peak: °F/psig/RH/Time	280/45/100/ 30 min.	310/78/100/30 min.	2 PEAKS
~~Decrease~~ Drop To: °F/psig/RH/Time	280→150/45→0/100/ 30m→1hr	255/30/100/91 hours	
~~Decrease~~ Drop To: °F/psig/RH/Time	150→120/0/100 1hr→48 hrs	195/10/100/623 hours	
Decrease To: °F/psig/RH/Time	120/0/100/ >48 hrs	COOL TO AMBIENT	
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	——	——	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	——	TEST PER IEEE-323-1974	
Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8)	H_3BO_3 (2000 2200 ppm B); NaOH, 8.5-11 pH NOT STATED	3000 PPM BORON(0.28 molar H_3BO_3), 0.064 molar $Na_2S_2O_3$ NaOH to pH of 10.5 @ 77F	
Spray Density (gpm/ft^2)		1.2 gpm	
Spray Duration	0 - 4 hrs	24 hours (ASSUMED)	
Submergence Duration (4.1.3/2.2.5/2.2.5)	NONE	——	
In-Leakage Considered (5.2.6, 5.3.2/-/-)		——	
Time to Submergence		——	
Dust Environment (-/2.2.11/2.2.11)	——	——	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

NOTES:

1. The serial numbers are provided in PSR #45 on the "walk down" sheets
2. For most motorized valve actuators (MVA's) the motor manufacturer, class of insulation, and whether or not the MVA contains a motor-brake assembly has been identified in PSR #45 and on the SCEWs
3. The component interfaces (i.e. motor leads, splices) are not considered part of the MVA by the licensee and will be addressed separately.
4. The nameplate operating conditions for the MVA are provided in PSR #45 on the "walk down" sheets.
5. For the equipment located inside containment, a required operating time of 120 days is specified. PSR #45 has attempted to extrapolate the saturated steam test data to extend the qualified duration. The following facts should be noted in considering this methodology:

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

NOTES:

a. The installed motor is Class B
b. The replacement motor is Class RH
c. The extrapolation and thermal aging analyses use data from BØØ58.
d. Class RH data is used to extend the test duration
e. Class B data is used in evaluating thermal aging and relative humidity.
f. The 165°F/100%RH/200hr. exposure cited in BØØ58 for class B motors was performed in BØØØ3 and simulates only a small fraction of the installed life.
g. The thermal aging (log-life) data in BØØ58 (for both Class B and RH) did not consider RH. These were air-oven aging tests.

The following is noted with respect to this application of the Arrhenius Methodology:

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 justifying 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

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 112

NOTES:

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 by oxidation--when exposed to elevated temperatures in the presence of air. 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 as an aging procedure. In addition, the Arrhenius 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 anomalies 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.

Though the licensee has not provided the technical basis for extending the test duration by using Arrhenius, the licensee did state the following with respect to thermal aging. (PSR #43)

"Question #13

Report B0058, Section 3.2.1.3 (Thermal Aging) addresses that 100% relative humidity was maintained during the thermal aging procedure. Because there is no known method to contemplate the effects of humidity aging it is sufficient to assume that this meets the condition by keeping 100% RH during thermal aging of the equipment."

NOTES:

This statement has not been related to the test duration. extension and pressure effects were also not addressed. However, there was no indication during the test that continued exposure to the post-LOCA conditions would result in a failure of the device, and, as such, this device is considered qualified for the specified duration

6. Thermal aging has been addressed in B0058 (for the motor insulation system. The licensee has also addressed the qualification of the seals, gaskets and the lubricants. The limit and torque switches are to be replaced along with the motor and thermal aging of these devices has been addressed in B0058. These devices are composed of plastics and metals which are not significantly affected by thermal aging degradation. Terminal strips (blocks) and connector have been addressed also. The licensee

NOTES:

has stated that the equipment interfaces will be addressed as separate items. The licensee should be aware that teflon is used in many motor leads and is susceptible to thermal aging and radiation effects.

7. The difference in motor manufacturers has been adequately addressed

GENERAL NOTE:

Since the licensee has committed to replace the motor, limit switches, install "T" drains on the limit switch compartments and use grease relief valves on the main gear box; the licensee should provide documented evidence that the modified MVA and the tested MVA are similar because the changes are extensive. This request is meant as a precaution to assure qualification.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 113

EQUIPMENT ITEM NO. 113
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-47B)
LIMITORQUE MODEL SMB00, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 113
LICENSEE REFERENCE(S): 659, 706, 45
FUNCTION (PLANT ID): AUXILIARY FEEDWATER/HELB MITIGATION (MOV-FW-251A TO F)
LICENSEE SUBMITTAL: SCEW(S): 6-99 TO -104

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, (P), H, (CS), (A), S, (R), M, I, QM, RPN, EXN, SEN, (QI), RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, ~~3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 113

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X Tne Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
X Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action by third quarter of 1982 (820930).)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b Modification)	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 113

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

For detailed evaluation of the referenced documents refer to equipment item #112. The licensee has committed to replace the torque switch on MOV-FW-251A,B,C in addition to the other modifications noted.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 113

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.8.1 Motor Operators Without Brakes

PLANT ID NO.	WORKSHEET PAGE NO.
MOV-FW251A	6-96
MOV-FW251B	6-97
MOV-FW251C	6-98
MOV-FW251D	6-99
MOV-FW251E	6-100
MOV-FW251F	6-101
MOV-2535	6-196
MOV-2536	6-197

7.2.8.1.1 Modification/Replacement Status

Additional vendor qualification documentation comprised of a listing of the special operator features (e.g., actuator motor, limit switch and torque switches, insulating and housing materials, splices, etc., used in the various vendor qualification tests was received. For each MOV with incomplete qualification data, we conducted a field inspection to determine the existence of any unqualified components. We will replace all unqualified parts with qualified ones.

7.2.8.1.2 Modification/Replacement Schedule

Based on current projections for purchase order placement, material delivery and our present outage schedule, these modifications are scheduled to start during the third quarter of 1982.

7.2.8.1.3 Justification For Continued Operation

Review of the available qualification documents, some dating back to the time at which Surry was built, indicates that valve actuators with parts similar to those slated for replacement were demonstrated by testing and analysis to be capable of functioning in the harsh environments more severe than that expected in Surry following DBA/HELB.

Also, no failure of any significance were experienced during these tests to indicate a potential for common mode failures. On this basis, it is concluded that continued operation of Surry Units in the interim with this equipment, albeit incomplete in qualification documentation, will have little or no effect on safety.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 114

EQUIPMENT ITEM NO. 114
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING CHARGING PUMP CUBICLE (AB-2C)
LIMITORQUE, MODEL NOT STATED, PEERLESS MOTOR, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 114
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): CHARGING PUMP 2-CH-P-1A RECIRCULATION TO REFUELING WATER STORAGE TANK (MOV-2275A)
LICENSEE SUBMITTAL: SCEW(S): 6-2

LESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

R, T, (QT), RT, P, H, CS, (A), S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
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Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 114

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a Qualified)
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 114

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	____
II.a	Equipment Qualification Not Established	____
II.b	Equipment Not Qualified	____
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	____
III.a	Equipment Exempt From Qualification	____
III.b	Equipment Not in the Scope of the Qualification Review	____
IV	Documentation Not Made Available	____

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 114

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

____ (1) COMPONENTS DELETED FROM THE MASTER LIST

____ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

____ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 115

EQUIPMENT ITEM NO. 115
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING CHARGING PUMP CUBICLE (AB-2C)
LIMITORQUE MODEL SMB WITH CLASS B INSULATION; SIZES 00, 000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 115
LICENSEE REFERENCE(S): 062, 659, 29
FUNCTION (PLANT ID): CHARGING PUMP 2-CH-P-1C RECIRCULATION TO REFUELING WATER STORAGE TANK (MOV-2275C, B)
LICENSEE SUBMITTAL: SCEW(S): 6-4, 6-3
FUNCTION (PLANT ID): CHARGING PUMP SUCTION FROM VOLUME CONTROL TANK (MOV-2115E, C)
LICENSEE SUBMITTAL: SCEW(S): 6-16, -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

→ MOV-2115E, C only

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 115

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

X The Licensee (has/~~has not~~) provided a response to the SER concerns.

X The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

X The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

[I.a Qualified]	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 115

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

REFER TO EQUIPMENT ITEM #64 FOR DETAILED EVALUATION OF THE REFERENCED REPORTS. SPECIFIC NOTES, IF ANY, WILL BE FOUND ON THE APPROPRIATE NOTE PAGES.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 115

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component has been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

___ (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

X (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 116

EQUIPMENT ITEM NO. 116
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING
ROSEMOUNT MODEL 1152AP7A22PB
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 104
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT PRESSURE POST-ACCIDENT MONITORING (PT-LM-201A, -201B)
LICENSEE SUBMITTAL: SCEW(S): T-1, T-2 [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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f,~~ 5g, ~~5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 116

NA new item

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 (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 116

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

LICENSEE RESPONSE TO NRC SER

5. Rosemount Inc. - Pressure Transmitters

Plant ID No.	Model	Worksheet Page No.
PT-LM-201A	1152AP7A22PB	10.3-1
PT-LM-201B	1152AP7A22PB	10.3-2

Transmitters test documentation is presently being upgraded from IEEE 323-1971 to IEEE 323-1974.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 117

EQUIPMENT ITEM NO. 117
SOLENOID VALVE LOCATED IN THE SAFEGUARDS AREA
ASCO MODEL NP831 54E
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 105
LICENSEE REFERENCE(S): 649
FUNCTION (PLANT ID): CONTAINMENT ISOLATION (SOV-DA-203A, B)
LICENSEE SUBMITTAL: SCEW(S): T-3, T-4 [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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	~~3a, 3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 117

NA new item

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ Tne Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
(II.c) Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 117

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	X
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	X
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See equipment item no. 101 for evaluation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 118

EQIUPMENT ITEM NO. 118
LEVEL TRANSMITTER LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
GEMS MODELS XM-54854 AND XM-54853
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 106
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): REACTOR COOLANT WATER LEVEL (WIDE RANGE) (LT-RS-251A, B)
LICENSEE SUBMITTAL: SCEW(S): T-30, T-31 [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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 118

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

NA new item

___ Tne Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
(II.a) Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 118

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 118

LICENSEE RESPONSE TO NRC SER

1. GEMS - Level Transmitters

Plant ID No.	Model	Worksheet Page No.
LT-RS-151A	XM-54854 & XM-54853	10.3-30
LT-RS-151B	XM-54854 & XM-54853	10.3-31
LT-DA-110A	XM-54854	10.3-5
LT-DA-110B	XM-54854	10.3-6

Components are presently being qualified to IEEE 323-1974.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 119

EQUIPMENT ITEM NO. 119
LEVEL TRANSMITTER LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
GEMS MODEL XM-54854
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 107
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): REACTOR COOLANT SUMP WATER LEVEL, NARROW RANGE (LT-DA-210A, B)
LICENSEE SUBMITTAL: SCEW(S): T-5, T-6 [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) New Item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e,~~ 5f, ~~5g, 5h, 5i, 5j.~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 119

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

NA new item

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 119

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 119

LICENSEE RESPONSE TO NRC SER

1. GEMS - Level Transmitters

Plant ID No.	Model	Worksheet Page No.
LT-RS-151A	XM-54854 & XM-54853	10.3-30
LT-RS-151B	XM-54854 & XM-54853	10.3-31
LT-DA-110A	XM-54854	10.3-5
LT-DA-110B	XM-54854	10.3-6

Components are presently being qualified to IEEE 323-1974.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

EQUIPMENT ITEM NO. 120
LIMIT SWITCH LOCATED IN THE SAFEGUARDS AREA
NAMCO MODEL EA180-31302
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 108
LICENSEE REFERENCE(S): 4447
FUNCTION (PLANT ID): CONTAINMENT ISOLATION AUXILIARY BUILDING SUMP (ZS-DA-203A, B)
LICENSEE SUBMITTAL: SCEW(S): T-7, T-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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	~~3a, 3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

NA new item

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
(II.c) Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	X
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	X
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines ___; NUREG-0588, Cat. I X; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	Limit Switch	Limit Switch	
Manufacturer's Name (5.2.2/-/-)	NAMCO	NAMCO Controls	
Model Number (5.2.2/-/-)	EA180-31902	EA-180, Type 23	
Serial Number	—	EA-180-11302,Rev.-D	
Features/Mounting (5.2.6/-/-)	—	Horizontal in Autoclave	
Connections/Interfaces (5.2.6/-/-)	—	—	
Location/Elevation	Outside Containment	Not Applicable	
Equipment ID No.	ZS-DA-103A ZS-DA-103B	Not Applicable	
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	Not stated	No Report I/D Number	
Report Date	March 3, 1980	8/20/81	
Issued by	Cleveland Development Co.	ACME CLEVELAND DEVELOPMENT COMPANY	
Prepared for		NAMCO CONTROLS	
Referenced Reports	—	Not Stated	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	Sequential Test	Sequential Test	
QUALIFICATION TEST PROGRAM			
Functional Test Description (5.2.5/2.2.9/2.2.9)	—	Make/break contact	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.	—	0.5Amps @ 100 Vdc	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	—	Not Stated	
Accuracy (5.2.5/-/-)	Not Required	Not Stated	
Number of Specimens	—	One (1)	
Test Instruments Calibrated	—	Yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Active		
Test Duration (5.2.1/-/-)	—	30 days	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	120 days	Not Applicable	Note 2, page 5f
Required Function Time	120 days	Not Applicable	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	—	Inspection/Base line data Heat/Humidity Aging	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)	—	Mechanical Aging Irradiation Seismic testing LOCA Simulation	
1. Representative Sample			
2. Baseline Data			
3. Performance Extremes			
4. Thermal Aging			
5. Radiation Aging			
6. Wear Aging			
7. Vibration/Seismic			
8. DBE Exposure			
9. Post-DBE Exposure			
10. Inspection			
Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	See Note 3, page 5f.	120°C for 400 hours	
Material Aging Evaluation (7.0/-/-)	—	Not Stated	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	—	Not Stated	
Radiation Aging, Type	—	Gamma	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)	8.8 E2 Rads	204 Megarads	*
Radiation Aging, Dose Rate	—	0.7 Megarads/ hour	
Radiation Aging, Method	Sequential Test	Test	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	—	Not Stated	
Operational Aging (-/4.2/-)	—	100,000 Actuation Cycles	
Other Age Conditioning (-/4.2/-)	—	Not Stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	None Claimed	None Claimed	See Note 1, page 5f.
Normal Ambient Temperature	120°F	Not Applicable	
Normal Ambient Radiation	—	Not Applicable	
Normal Ambient Humidity	—	Not Applicable	
On-Going Surveillance and Preventive Maintenance (7.0/-/-)		Not Applicable	See Note 3, page 5f.
On-Going Analysis of Failures and Degradation (7.0/-/-)	—	Not Applicable	
Margin (General) (6.0/3.0/3.0)	—	Not Stated/ Not Appicable	
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)	—	Not Stated	

* Radiation aging and accident doses were combined in a single Exposure prior to the LOCA Simulation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	LOCA	LOCA/MSLB	
Radiation Type	—	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	8 E 6 Rads	204 Megarads	*
Radiation Dose Rate (rd/hr)	—	0.7 Megarads per hour	
Radiation Qual. Method (5.3.1/-/-)	Test	Test	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	—	Not Applicable	
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)	—	Not Applicable	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	—	Not Applicable	

*Radiation aging and accident doses were combined in a single Exposure prior to the LOCA Simulation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase	Not Required	11°F/8psi/sec	
Peak: °F/psig/RH/Time		340/115/100/3h4s	
Decrease To: °F/psig/RH/Time		140/-/-/2h4r 340/105/100/3hrs	
Decrease To: °F/psig/RH/Time		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, 2.2.6/1.2.5.C, 2.2.6)		Not Applicable	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)		Test	
Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8)		Boric Acid/water/sodium thiosulfate/sodium hydroxide	
Spray Density (gpm/ft^2)		0.15	
Spray Duration		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 (-/2.2.11/2.2.11)		Not Applicable	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 120

NOTES:

1. The qualification report (reference [4447]) provides a reasonable estimate of qualified life, viz. 5 years at 55°C. The licensee should implement a replacement program for complete qualification of this item.

2. This is a harsh environment due to radiation. The accident duration is assumed to be the full 120 days of the required function time.

3. The licensee's response to equipment aging is as follows:

Vepco has not fully developed an aging evaluation program to meet the current requirements for addressing aging as outlined in the Safety Evaluation Report and as discussed in the meetings held in Bethesda on July 7-10, 1981. As indicated previously in I.E. Bulletin 79-01B 90 Day Review, Revision 3, a program to assess the failure mechanisms of all class 1E electrical equipment has been developed and implemented at Surry.

The Atomic Industrial Forum is currently drafting a position paper which Vepco feels has merit with regard to addressing the aging concerns. Implementation of this program is contingent, however, on review of the existing preventive maintenance program at the station. Vepco is currently reviewing the draft AIF position paper on aging evaluation methods in conjunction with the existing preventive maintenance program at Surry. An aging evaluation program which meets the requirements of the SER will be implemented by June 1982.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 121

EQUIPMENT ITEM NO. 121
ACCELEROMETER LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
ENDEVCO MODEL 2273AM20
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 109
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER SAFETY AND PORV VALVE POSITION INDICATOR (YE-200A-1, -2; -200B-1, -2; -200C-1, -2; -201A-1, -2; 201B-1, -2)
LICENSEE SUBMITTAL: SCEW(S): T-9 THROUGH T-18 [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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
X Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
(I.b) Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 121

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	____
II.a	Equipment Qualification Not Established	____
II.b	Equipment Not Qualified	____
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	____
III.a	Equipment Exempt From Qualification	____
III.b	Equipment Not in the Scope of the Qualification Review	____
IV	Documentation Not Made Available	____

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 121

LICENSEE RESPONSE TO NRC SER

3. Endevco - Acoustical Monitoring Accelerometer

Plant ID No.	Model	Worksheet Page No.
YE-VMS-200A-1	2273AM20	10.3-9
YE-VMS-200A-2	2273AM20	10.3-10
YE-VMS-200B-1	2273AM20	10.3-11
YE-VMS-200B-2	2273AM20	10.3-12
YE-VMS-200C-1	2273AM20	10.3-13
YE-VMS-200C-2	2273AM20	10.3-14
YE-VMS-201A-1	2273AM20	10.3-15
YE-VMS-201A-2	2273AM20	10.3-16
YE-VMS-201B-1	2273AM20	10.3-17
YE-VMS-201B-2	2273AM20	10.3-18

The monitoring equipment is currently in the process of being qualified to the requirements of IEEE 323-1974. The information on the worksheets is the levels to which the equipment will be tested.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 122

EQUIPMENT ITEM NO. 122
HARDLINE COAXIAL CABLE LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
ENDEVCO MODEL 3075M6
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 110
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION SIGNAL TRANSMISSION (LOW NOISE CABLE)
LICENSEE SUBMITTAL: SCEW(S): T-19 [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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j.~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b.~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 122

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ 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
X Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/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
(I.b) Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12.2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

LICENSEE RESPONSE TO NRC SER

4. Endevco Supplied Cable - Acoustical Monitoring Equipment

Plant ID No.	Model	Worksheet Page No.
Low Noise Cable	3075M6	10.3-19

The cable is currently in the process of being qualified to the requirements of IEEE 323-1974. The information on the worksheet reflects the levels to which the equipment will be tested.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 123

EQUIPMENT ITEM NO. 123
CHARGE PREAMPLIFIER LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
UNHOLTZ-DICKIE MODEL 22CA-2TR
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 111
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER PORV AND SAFETY VALVE POSITION INDICATION (YY-VMS-200A-1, -2; B-1, -2; C-1, -2; -201A-1, -2; B-1, -2)
LICENSEE SUBMITTAL: SCEW(S): T-20 THROUGH T-29 [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) New item

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~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 123

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

X Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
X Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 123

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

LICENSEE RESPONSE TO NRC SER

2. Unholtz-Dickie - Acoustical Monitoring Preamplifier

Plant ID No.	Model	Worksheet Page No.
YY-VMS-200A-1	22CA-2TR	10.3-20
YY-VMS-200A-2	22CA-2TR	10.3-21
YY-VMS-200B-1	22CA-2TR	10.3-22
YY-VMS-200B-2	22CA-2TR	10.3-23
YY-VMS-200C-1	22CA-2TR	10.3-24
YY-VMS-200C-2	22CA-2TR	10.3-25
YY-VMS-201A-1	22CA-2TR	10.3-26
YY-VMS-201A-2	22CA-2TR	10.3-27
YY-VMS-201B-1	22CA-2TR	10.3-28
YY-VMS-201B-2	22CA-2TR	10.3-29

The monitoring equipment is currently in the process of being qualified to the requirements of IEEE 323-1974. The information on the worksheets is the levels to which the equipment will be tested.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

EQUIPMENT ITEM NO. 124
SOLENOID VALVE LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
VALCOR MODEL V526
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 112
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POST-ACCIDENT SAMPLING (HCV-SS-200A, -200B)
LICENSEE SUBMITTAL: SCEW(S): 10.3-38, -39 [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), I, QM, RPN, EXN, SEN, QI, RPS, None,

Not stated, (Not applicable) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, ~~5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

NA new item

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified	II.c Qualified Life Deficiency
I.b Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

LICENSEE RESPONSE TO NRC SER

6. Valcor - Solenoid Operated Valves

Plant ID No.	Model	Worksheet Page No.
TV-SS-202A	V526-5683-19	10.3-32
TV-SS-202B	V526-5683-19	10.3-33
TV-SS-206A	V526-5683-19	10.3-34
TV-SS-206B	V526-5683-19	10.3-35
HCV-SS-201D	V526-5683-19	10.3-36
HCV-SS-202A	V526-5683-19	10.3-37
HCV-SS-200A	V526-5683-19	10.3-38
HCV-SS-200B	V526-5683-19	10.3-39
TV-SS-203A	V526-5683-19	10.3-40
TV-SS-203B	V526-5683-19	10.3-41
S2-XCV-2401A	V526-5683-19	10.3-62
S2-XCV-2401B	V526-5683-19	10.3-63
S2-XCV-2422A	V526-5683-19	10.3-64
S2-XCV-2422B	V526-5683-19	10.3-65
TV-GW-200	V526-5695-31	10.3-76
TV-GW-201	V526-5695-31	10.3-77
TV-GW-202	V526-5695-31	10.3-78
TV-GW-203	V526-5695-31	10.3-79
TV-GW-204	V526-5695-31	10.3-80
TV-GW-205	V526-5695-31	10.3-81
TV-GW-206	V526-5695-31	10.3-82
TV-GW-207	V526-5695-31	10.3-83

The vendor has been contacted for qualification test data.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

Criteria: DOR Guidelines ___; NUREG-0588, Cat. I X ; NUREG-0588, Cat. II ___.

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
EQUIPMENT DESCRIPTION			
Equipment Type	Solenoid Valve	Solenoid Valve	
Manufacturer's Name (5.2.2/-/-)	Valcor Engineering	Valcor Engineering	
Model Number (5.2.2/-/-)	V526-5683-19 and V526-5295-31	V52600-5291-2	
Serial Number			
Features/Mounting (5.2.6/-/-)			
Connections/Interfaces (5.2.6/-/-)			
Location/Elevation	Containment and Aux. Bldg.		
Equipment ID No.	various		
QUALIFICATION REPORT (8.0/5.0/5.0)			
Report ID Number	not cited	QR-52600-5940-2	
Report Date		05-July-1979	
Issued by		Valcor Engineering Corp.	
Prepared for		Isomedix Inc.	
Referenced Reports		IFR-V877-01	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)		Type Test	
QUALIFICATION TEST PROGRAM			
Functional Test Description (5.2.5/2.2.9/2.2.9)		Insulation Resistance Tests	
Operating Conditions (-/2.2.10/2.2.10) Load/Cycles/Voltage/ Current/Freq.		108 VAC 44 psig N_2	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)		Pass Functional Tests, Demonstrate Satisfactory Operability	
Accuracy (5.2.5/-/-)		ND	
Number of Specimens		1	
Test Instruments Calibrated		Yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Active; Cont. Isolation and Post Accident Sampling system		
Test Duration (5.2.1/-/-)		31 Days	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)			
Required Function Time	120 days		
Test Sequence (General) (5.2.3/2.3.1/2.3.1)			
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)		TA/OPER/RAD/SEIS/STM+CHSP	
1. Representative Sample			
2. Baseline Data			
3. Performance Extremes			
4. Thermal Aging			
5. Radiation Aging			
6. Wear Aging			
7. Vibration/Seismic			
8. DBE Exposure			
9. Post-DBE Exposure			
10. Inspection			
Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis		318 deg.F, 172 Hr. To Simulate 40 Yrs. @ 120 deg.F	
Material Aging Evaluation (7.0/-/-)		MR52600-515-2 Additional 442 Hr.@318°F to age polyimide to 40 Yr.	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)		Coil Materials	
Radiation Aging, Type		GAMMA	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
Radiation Aging, Dose (rd)		50×10^6	
Radiation Aging, Dose Rate		0.75 Mrd/h	
Radiation Aging, Method		Test	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)			
Operational Aging (-/4.2/-)		7500 cycles 44psig N_2	
Other Age Conditioning (-/4.2/-)		Seismic Simulation	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	none	40 Yr./40 Yr.	
Normal Ambient Temperature Normal Ambient Radiation Normal Ambient Humidity			
On-Going Surveillance and Preventive Maintenance (7.0/-/-)			
On-Going Analysis of Failures and Degradation (7.0/-/-)			
Margin (General) (6.0/3.0/3.0)			
Margin (NUREG-0588, Cat. I) (-/3.2/-) 1. Temperature (+15°F) 2. Pressure (+10%, 10 psig max) 3. Radiation (not required) 4. Time (+10%, +1 hour + function time minimum)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
ACCIDENT CONDITIONS			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)			
Radiation Type		GAMMA	
Radiation Dose (rd) (4.1.2/1.4/1.4)	3.7×10^7 rd	150×10^6	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)		0.75×10^6, Test	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)			
Equipment Susceptible to Beta Radiation (4.1.2/-/-)			
Radiation Dose (Normal + Accident) (4.1.2/-/-)	3.7×10^7 rd.	200×10^6 rad	
Plateout Dose Considered (-/1.48/1.48)		NA	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)		NA	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS			
Rate of Temp./Press. Increase		Not Stated But Within 3 - 5 Min.	
Peak: °F/psig/RH/Time	275/45/-/30min.	346/113/100/3h	
Decrease To: °F/psig/RH/Time	275 / 150 / 45 / 1.0 / -/30min.	335/113/100/3h	
Decrease To: °F/psig/RH/Time	150 / 125 / 1.0 / -/47hr.	315/69/100/4h	
Decrease To: °F/psig/RH/Time	150/1.0/-/120days	272/28/100/4h	
Equipment Surface Temperature (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)		245/13/100/27.5d	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)		Test (Simultaneous)	
Spray Composition (4.1.4/1.3, 2.2.8/1.3, 2.2.8)	H_3BO_3 (2000 - 2200 ppm) NaOH buffer ph 8.5 - 11	2200 ppm Boron H_3BO_3 0.064m $Na_2S_2O_3$ NaOH, ph=10.5	
Spray Density (gpm/ft^2)		0.15 gpm/ft^2	
Spray Duration	4 hr.	44,640 min.	
Submergence Duration (4.1.3/2.2.5/2.2.5)	NA		
In-Leakage Considered (5.2.6, 5.3.2/-/-)			
Time to Submergence	NA		
Dust Environment (-/2.2.11/2.2.11)			

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 124

NOTES:

1. It was determined by analysis that polyimide would require additional thermal aging of 442 hr. @ 318°F to simulate 40 yrs @ 120°F. All other coil materials were subsequently overaged during the additional thermal aging.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 125

EQUIPMENT ITEM NO. 125
SOLENOID VALVE LOCATED INSIDE CONTAINMENT, OUTSIDE CRANEWALL
VALCOR MODEL V526
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 113
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG SAMPLING VALVE (TV-SS-202A, -206A, -203A; HCV-SS-201D, -202A)
LICENSEE SUBMITTAL: SCEW(S): 10.3-32, -34, -40, -36, -37 [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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 125

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 125

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

See item 124 for evaluation

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 125

LICENSEE RESPONSE TO NRC SER

6. Valcor - Solenoid Operated Valves

Plant ID No.	Model	Worksheet Page No.
TV-SS-202A	V526-5683-19	10.3-32
TV-SS-202B	V526-5683-19	10.3-33
TV-SS-206A	V526-5683-19	10.3-34
TV-SS-206B	V526-5683-19	10.3-35
HCV-SS-201D	V526-5683-19	10.3-36
HCV-SS-202A	V526-5683-19	10.3-37
HCV-SS-200A	V526-5683-19	10.3-38
HCV-SS-200B	V526-5683-19	10.3-39
TV-SS-203A	V526-5683-19	10.3-40
TV-SS-203B	V526-5683-19	10.3-41
S2-XCV-2401A	V526-5683-19	10.3-62
S2-XCV-2401B	V526-5683-19	10.3-63
S2-XCV-2422A	V526-5683-19	10.3-64
S2-XCV-2422B	V526-5683-19	10.3-65
TV-GW-200	V526-5695-31	10.3-76
TV-GW-201	V526-5695-31	10.3-77
TV-GW-202	V526-5695-31	10.3-78
TV-GW-203	V526-5695-31	10.3-79
TV-GW-204	V526-5695-31	10.3-80
TV-GW-205	V526-5695-31	10.3-81
TV-GW-206	V526-5695-31	10.3-82
TV-GW-207	V526-5695-31	10.3-83

The vendor has been contacted for qualification test data.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 126

EQUIPMENT ITEM NO. 126
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING
VALCOR MODEL V526
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 114
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): HYDROGEN ANALYZER CONTAINMENT ISOLATION (TV-GW-200 THROUGH -207; TV-SS-202B, -203B, -206B; S1-XCV-2401A, B; -2422A, B)
LICENSEE SUBMITTAL: SCEW(S): 10.3-76 THROUGH -83; 10.3-33, -35, -41, -62, -63, -64, -65 [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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
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Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 126

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

NA new item

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

(I.a) Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 126

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	____
Adequate Similarity Between Equipment and Test Specimen Established	____
Aging Degradation Evaluated Adequately	____
Qualified Life or Replacement Schedule Established (If Required)	____
Program Established to Identify Aging Degradation	____
Criteria Regarding Aging Simulation Satisfied (If Required)	____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	____
o Peak Pressure Adequate	____
o Duration Adequate	____
o Required Profile Enveloped Adequately	____
o Steam Exposure (If Required) Adequate	____
Criteria Regarding Spray Satisfied	____
Criteria Regarding Submergence Satisfied	____
Criteria Regarding Radiation Satisfied	____
Criteria Regarding Test Sequence Satisfied	____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	____
Criteria Regarding Functional Testing Satisfied	____
Criteria Regarding Instrument Accuracy Satisfied	____
Test Duration Margin (1 hour + Function Time) Satisfied	____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	____

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	X
I.b	Equipment Qualification Pending Modification	____
II.a	Equipment Qualification Not Established	____
II.b	Equipment Not Qualified	____
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	____
III.a	Equipment Exempt From Qualification	____
III.b	Equipment Not in the Scope of the Qualification Review	____
IV	Documentation Not Made Available	____

See equipment item no. 124 for evaluation.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 126

LICENSEE RESPONSE TO NRC SER

6. Valcor - Solenoid Operated Valves

Plant ID No.	Model	Worksheet Page No.
TV-SS-202A	V526-5683-19	10.3-32
TV-SS-202B	V526-5683-19	10.3-33
TV-SS-206A	V526-5683-19	10.3-34
TV-SS-206B	V526-5683-19	10.3-35
HCV-SS-201D	V526-5683-19	10.3-36
HCV-SS-202A	V526-5683-19	10.3-37
HCV-SS-200A	V526-5683-19	10.3-38
HCV-SS-200B	V526-5683-19	10.3-39
TV-SS-203A	V526-5683-19	10.3-40
TV-SS-203B	V526-5683-19	10.3-41
S2-XCV-2401A	V526-5683-19	10.3-62
S2-XCV-2401B	V526-5683-19	10.3-63
S2-XCV-2422A	V526-5683-19	10.3-64
S2-XCV-2422B	V526-5683-19	10.3-65
TV-GW-200	V526-5695-31	10.3-76
TV-GW-201	V526-5695-31	10.3-77
TV-GW-202	V526-5695-31	10.3-78
TV-GW-203	V526-5695-31	10.3-79
TV-GW-204	V526-5695-31	10.3-80
TV-GW-205	V526-5695-31	10.3-81
TV-GW-206	V526-5695-31	10.3-82
TV-GW-207	V526-5695-31	10.3-83

The vendor has been contacted for qualification test data.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 127

EQUIPMENT ITEM NO. 127
LIMIT SWITCH LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
GORDOS MODEL MR8901
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 115
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): RHR SYSTEM OUTLET POST-ACCIDENT SAMPLING VALVE (ZS-SS-200A-1, -2; -200B-1, -2)
LICENSEE SUBMITTAL: SCEW(S): 10.3-54, -55, -56, -57 [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) new item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 127

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 (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 127

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 127

LICENSEE RESPONSE TO NRC SER

7. Gordos - Limit Switches

Plant ID No.	Model	Worksheet Page No.
ZS-SS-202A-1	MR8901	10.3-42
ZS-SS-202A-2	MR8901	10.3-43
ZS-SS-202B-1	MR8901	10.3-44
ZS-SS-202B-2	MR8901	10.3-45
ZS-SS-206A-1	MR8901	10.3-46
ZS-SS-206A-2	MR8901	10.3-47
ZS-SS-206B-1	MR8901	10.3-48
ZS-SS-206B-2	MR8901	10.3-49
ZS-SS-201D-1	MR8901	10.3-50
ZS-SS-201D-2	MR8901	10.3-51
ZS-SS-202A-3	MR8901	10.3-52
ZS-SS-202A-4	MR8901	10.3-53
ZS-SS-200A-1	MR8901	10.3-54
ZS-SS-200A-2	MR8901	10.3-55
ZS-SS-200B-1	MR8901	10.3-56
ZS-SS-200B-2	MR8901	10.3-57
ZS-SS-203A-1	MR8901	10.3-58
ZS-SS-203A-2	MR8901	10.3-59
ZS-SS-203B-1	MR8901	10.3-60
ZS-SS-203B-2	MR8901	10.3-61
ZS-XCV-2401A-1	MR8901	10.3-66
ZS-XCV-2401A-2	MR8901	10.3-67
ZS-XCV-2401B-1	MR8901	10.3-68
ZS-XCV-2401B-2	MR8901	10.3-69
ZS-XCV-2422A-1	MR8901	10.3-70
ZS-XCV-2422A-2	MR8901	10.3-71
ZS-XCV-2422B-1	MR8901	10.3-72
ZS-XCV-2422B-2	MR8901	10.3-73
ZS-GW-200-1	MR8901	10.3-84
ZS-GW-200-2	MR8901	10.3-85
ZS-GW-201-1	MR8901	10.3-86
ZS-GW-201-2	MR8901	10.3-87
ZS-GW-202-1	MR8901	10.3-88
ZS-GW-202-2	MR8901	10.3-89
ZS-GW-203-1	MR8901	10.3-90
ZS-GW-203-2	MR8901	10.3-91
ZS-GW-204-1	MR8901	10.3-92
ZS-GW-204-2	MR8901	10.3-93
ZS-GW-205-1	MR8901	10.3-94
ZS-GW-205-2	MR8901	10.3-95
ZS-GW-206-1	MR8901	10.3-96
ZS-GW-206-2	MR8901	10.3-97
ZS-GW-207-1	MR8901	10.3-98
ZS-GW-207-2	MR8901	10.3-99

The vendor has been contacted for qualification test data.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 128

EQUIPMENT ITEM NO. 128
LIMIT SWITCH LOCATED INSIDE CONTAINMENT, OUTSIDE CRANEWALL
GORDOS MODEL MR8901
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 116
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG SAMPLING VALVE (ZS-SS-202A-1, -2; -206A-1, -2; -201D-1, -2; 202A-3, -4; 203A-1, -2)
LICENSEE SBUMITTAL: SCEW(S): 10.3-42, -43, -46, -47, -50, -51, -52, -53, -58, -59 [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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 128

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 (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 128

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

LICENSEE RESPONSE TO NRC SER

7. Gordos - Limit Switches

Plant ID No.	Model	Worksheet Page No.
ZS-SS-202A-1	MR8901	10.3-42
ZS-SS-202A-2	MR8901	10.3-43
ZS-SS-202B-1	MR8901	10.3-44
ZS-SS-202B-2	MR8901	10.3-45
ZS-SS-206A-1	MR8901	10.3-46
ZS-SS-206A-2	MR8901	10.3-47
ZS-SS-206B-1	MR8901	10.3-48
ZS-SS-206B-2	MR8901	10.3-49
ZS-SS-201D-1	MR8901	10.3-50
ZS-SS-201D-2	MR8901	10.3-51
ZS-SS-202A-3	MR8901	10.3-52
ZS-SS-202A-4	MR8901	10.3-53
ZS-SS-200A-1	MR8901	10.3-54
ZS-SS-200A-2	MR8901	10.3-55
ZS-SS-200B-1	MR8901	10.3-56
ZS-SS-200B-2	MR8901	10.3-57
ZS-SS-203A-1	MR8901	10.3-58
ZS-SS-203A-2	MR8901	10.3-59
ZS-SS-203B-1	MR8901	10.3-60
ZS-SS-203B-2	MR8901	10.3-61
ZS-XCV-2401A-1	MR8901	10.3-66
ZS-XCV-2401A-2	MR8901	10.3-67
ZS-XCV-2401B-1	MR8901	10.3-68
ZS-XCV-2401B-2	MR8901	10.3-69
ZS-XCV-2422A-1	MR8901	10.3-70
ZS-XCV-2422A-2	MR8901	10.3-71
ZS-XCV-2422B-1	MR8901	10.3-72
ZS-XCV-2422B-2	MR8901	10.3-73
ZS-GW-200-1	MR8901	10.3-84
ZS-GW-200-2	MR8901	10.3-85
ZS-GW-201-1	MR8901	10.3-86
ZS-GW-201-2	MR8901	10.3-87
ZS-GW-202-1	MR8901	10.3-88
ZS-GW-202-2	MR8901	10.3-89
ZS-GW-203-1	MR8901	10.3-90
ZS-GW-203-2	MR8901	10.3-91
ZS-GW-204-1	MR8901	10.3-92
ZS-GW-204-2	MR8901	10.3-93
ZS-GW-205-1	MR8901	10.3-94
ZS-GW-205-2	MR8901	10.3-95
ZS-GW-206-1	MR8901	10.3-96
ZS-GW-206-2	MR8901	10.3-97
ZS-GW-207-1	MR8901	10.3-98
ZS-GW-207-2	MR8901	10.3-99

The vendor has been contacted for qualification test data.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 129

EQUIPMENT ITEM NO. 129
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING
GORDOS MODEL MR8901
REQUIRED OPERATING TIME: 120 DAYS
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG SAMPLING VALVE (ZS-SS-202B-2, -1; -206B-1, -2; 203B-1, -2; ZS-XCV-2401A-1, -2; -2401B-1, -2; 2422A-1, -2; -2422B-1, -2; ZS-GW-200-1, -2; -201-1, -2; -202-1, -2; -203-1, -2; -204-1, -2; -205-1, -2; -206-1, -2; -207-1, -2)
LICENSEE SUBMITTAL: SCEW(S): 10.3-45, -44, -48, -49, -60, -61, -66 THROUGH -69, -70 THROUGH -73, -84 THROUGH -99 [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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 129

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 (nas/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
(II.a) Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 129

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	X
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

LICENSEE RESPONSE TO NRC SER

7. Gordos - Limit Switches

Plant ID No.	Model	Worksheet Page No.
ZS-SS-202A-1	MR8901	10.3-42
ZS-SS-202A-2	MR8901	10.3-43
ZS-SS-202B-1	MR8901	10.3-44
ZS-SS-202B-2	MR8901	10.3-45
ZS-SS-206A-1	MR8901	10.3-46
ZS-SS-206A-2	MR8901	10.3-47
ZS-SS-206B-1	MR8901	10.3-48
ZS-SS-206B-2	MR8901	10.3-49
ZS-SS-201D-1	MR8901	10.3-50
ZS-SS-201D-2	MR8901	10.3-51
ZS-SS-202A-3	MR8901	10.3-52
ZS-SS-202A-4	MR8901	10.3-53
ZS-SS-200A-1	MR8901	10.3-54
ZS-SS-200A-2	MR8901	10.3-55
ZS-SS-200B-1	MR8901	10.3-56
ZS-SS-200B-2	MR8901	10.3-57
ZS-SS-203A-1	MR8901	10.3-58
ZS-SS-203A-2	MR8901	10.3-59
ZS-SS-203B-1	MR8901	10.3-60
ZS-SS-203B-2	MR8901	10.3-61
ZS-XCV-2401A-1	MR8901	10.3-66
ZS-XCV-2401A-2	MR8901	10.3-67
ZS-XCV-2401B-1	MR8901	10.3-68
ZS-XCV-2401B-2	MR8901	10.3-69
ZS-XCV-2422A-1	MR8901	10.3-70
ZS-XCV-2422A-2	MR8901	10.3-71
ZS-XCV-2422B-1	MR8901	10.3-72
ZS-XCV-2422B-2	MR8901	10.3-73
ZS-GW-200-1	MR8901	10.3-84
ZS-GW-200-2	MR8901	10.3-85
ZS-GW-201-1	MR8901	10.3-86
ZS-GW-201-2	MR8901	10.3-87
ZS-GW-202-1	MR8901	10.3-88
ZS-GW-202-2	MR8901	10.3-89
ZS-GW-203-1	MR8901	10.3-90
ZS-GW-203-2	MR8901	10.3-91
ZS-GW-204-1	MR8901	10.3-92
ZS-GW-204-2	MR8901	10.3-93
ZS-GW-205-1	MR8901	10.3-94
ZS-GW-205-2	MR8901	10.3-95
ZS-GW-206-1	MR8901	10.3-96
ZS-GW-206-2	MR8901	10.3-97
ZS-GW-207-1	MR8901	10.3-98
ZS-GW-207-2	MR8901	10.3-99

The vendor has been contacted for qualification test data.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 130

EQUIPMENT ITEM NO. 130
HYDROGEN ANALYZER LOCATED IN THE AUXILIARY BUILDING
COMSIP-DELPHI MODEL K-III
REQUIRED OPERATING TIME: 120 DAYS
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT HYDROGEN ANALYZER (H2A-GW-201-1, -2)
LICENSEE SUBMITTAL: SCEW(S): 10.3-74, -75 [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) New item

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, ~~3b, 3c, 3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 130

SUMMARY OF LICENSEE RESPONSES TO THE NRC SER - ONLY CHECKED ITEMS ARE APPLICABLE:

___ The Licensee (has/has not) provided a response to the SER concerns.

___ The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

___ The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.

___ Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.

___ Corrective action specified by the Licensee:

___ Equipment replacement with qualified equipment
___ Equipment modification
___ Equipment relocation above submergence level
___ Relocate or shield equipment from radiation source
___ Verify qualification by additional (testing/analysis)
___ Equipment relocation to a mild environment
___ Qualification testing of equipment in progress
___ Other (_____)

___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.

___ The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action _____.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified
I.b Modification
II.a Qualification Not Established
II.b Not Qualified
II.c Qualified Life Deficiency
III.a Exempt
III.b Not in Scope
(IV) Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 130

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	X

LICENSEE RESPONSE TO NRC SER

8. Comsip Delphi - Hydrogen Analyzer

Plant ID No.	Model	Worksheet Page No.
H2A-GW-201-1	K-III	10.3-74
H2A-GW-201-2	K-III	10.3-75

The vendor is retesting and evaluating component test. We have contacted the supplier for the qualification test data.

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 131

EQUIPMENT ITEM NO. 131
FLOW TRANSMITTER LOCATED INSIDE CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
FISCHER AND PORTER MODEL 10B2496QB
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 131
LICENSEE REFERENCE(S): 687
FUNCTION (PLANT ID): STEAM-FLOW TRANSMITTER (FT-2474, -2475, -2484, -2485, -2494, -2495)
LICENSEE SUBMITTAL: SCEW(S): 6-142 TO -147

DESIGNATION FOR DEFICIENCY IDENTIFIED BY THE NRC SER - CIRCLED ITEM(S) ONLY:
(See Section 3 of this TER for Legend)

(R), (T), (QT), RT, (P), H, (CS), (A), S, (R), M, I, QM, (RPN), EXN, SEN, QI, RPS, None,

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

Contents	Checksheet Page No.
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, 3b, 3c, ~~3d~~
System Consideration Review	~~4a, 4b, 4c, 4d, 4e, 4f~~
Equipment Environmental Qualification Review	~~5a, 5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5j~~
Installed TMI Lessons Learned Implementation Equipment Summary	~~6a, 6b~~
Maintenance and Replacement Schedule Summary	~~7a, 7b, 7c~~

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. L31

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/nas not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.

___ The Licensee has presented information which shows there are no outstanding qualification deficiencies.

X The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.

- X Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- X Corrective action specified by the Licensee:
  - X Equipment replacement with qualified equipment
  - ___ Equipment modification
  - ___ Equipment relocation above submergence level
  - ___ Relocate or shield equipment from radiation source
  - ___ Verify qualification by additional (testing/analysis)
  - ___ Equipment relocation to a mild environment
  - ___ Qualification testing of equipment in progress
  - ___ Other (_____)
- ___ The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- X The Licensee (nas/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action: 12/31/81.)

___ The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

DESIGNATION OF RESULTANT NRC QUALIFICATION EVALUATION CATEGORY BASED ON REVIEW - CIRCLED ITEM ONLY: (See Section 3 of this TER for Legend)

I.a Qualified	II.c Qualified Life Deficiency
(I.b) Modification	III.a Exempt
II.a Qualification Not Established	III.b Not in Scope
II.b Not Qualified	IV Documentation Not Available

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 131

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS	DESIGNATION: X = DEFICIENCY
Documented Evidence of Qualification Adequate	X
Adequate Similarity Between Equipment and Test Specimen Established	
Aging Degradation Evaluated Adequately	
Qualified Life or Replacement Schedule Established (If Required)	
Program Established to Identify Aging Degradation	
Criteria Regarding Aging Simulation Satisfied (If Required)	
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	
o Peak Pressure Adequate	
o Duration Adequate	
o Required Profile Enveloped Adequately	
o Steam Exposure (If Required) Adequate	
Criteria Regarding Spray Satisfied	
Criteria Regarding Submergence Satisfied	
Criteria Regarding Radiation Satisfied	
Criteria Regarding Test Sequence Satisfied	
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	
Criteria Regarding Functional Testing Satisfied	
Criteria Regarding Instrument Accuracy Satisfied	
Test Duration Margin (1 hour + Function Time) Satisfied	
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	

NRC QUALIFICATION CATEGORY		DESIGNATION: X = CATEGORY
I.a	Equipment Qualified	
I.b	Equipment Qualification Pending Modification	X
II.a	Equipment Qualification Not Established	
II.b	Equipment Not Qualified	
II.c	Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified	
III.a	Equipment Exempt From Qualification	
III.b	Equipment Not in the Scope of the Qualification Review	
IV	Documentation Not Made Available	

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 131

LICENSEE RESPONSE TO NRC SER

The present status of each component listed in Appendix B is indicated in the resolution column of Table 3. Each component as been placed into one of the following four categories:

___ (1) COMPONENTS DELETED FROM THE MASTER LIST

X (2) COMPONENTS REQUIRING REPLACEMENT OR MODIFICATION

___ (3) COMPONENTS DETERMINED TO BE QUALIFIED

___ (4) COMPONENTS DETERMINED TO BE QUALIFIED EXCEPT FOR AGING

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4 Fischer Porter (Transmitters)

PLANT ID NO.	MODEL NO.	WORKSHEET PAGE NO.
FT-2474	10B2496OB	6-142
FT-2475	10B2496OB	6-142
FT-2484	10B2496OB	6-144
FT-2485	10B2496OB	6-145
FT-2494	10B2496OB	6-146
FT-2495	10B2496OB	6-147
FT-FW-200A	10B2496PB-NS	6-87
FT-FW-200B	10B2496PB-NS	6-88
FT-FW-200C	10B2496PB-NS	6-89
PT-2464	50EP1041BCXA-NS	6-148
PT-2466	50EP1041BCXA-NS	6-149
PT-2468	50EP1041BCXA-NS	6-150
PT-2474	50EP1041BCXA-NS	6-151
PT-2475	50EP1041BCXA-NS	6-152
PT-2476	50EP1041BCXA-NS	6-153
PT-2484	50EP1041BCXA-NS	6-154
PT-2484	50EP1041BCXA-NS	6-155
PT-2486	50EP1041BCXA-NS	6-156
PT-2494	50EP1041BCXA-NS	6-157
PT-2495	50EP1041BCXA-NS	6-158
PT-2496	50EP1041BCXA-NS	6-159
PT-LM-200A	50EN1071BCXA	6-128
PT-LM-200B	50EN1071BCXA	6-129
PT-LM-200C	50EN1071BCXA	6-130
PT-LM-200D	50EN0171BCXA	6-131
PT-2455	10B2496OBXA-NS	6-185
PT-2456	10B2496OBXA-NS	6-186
PT-2457	10B2496OBXA-NS	6-187

7.2.4.1 Modification/Replacement Status

We are presently participating in a transmitter qualification program which is scheduled to be completed by June 1982. We have ordered replacement transmitters of the type being tested (Rosemount Series No. 1153D) to ensure that we will have transmitters available to replace existing types.

LICENSEE RESPONSE TO NRC SER (Continued)

7.2.4.2 Modification/Replacement Schedule

Replacement transmitters have been placed on order. Based on current projections for material delivery and our current outage schedule, replacement is scheduled to begin during the last quarter of 1981.

7.2.4.3 Justification For Continued Operation

These transmitters have been environmentally tested and have demonstrated their ability to provide an accident mitigation trip signal when subject to a harsh environment. Therefore, it is concluded that continued operation of the Surry Units in the interim with this equipment will have no effect on safety.

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 reached as a result of the review which require special attention. These are summarized below.

In general, the Licensee's effort to establish similarity between a device tested and that installed in the plant was well done. The program used to determine the level of qualification of the Limitorque motorized valve actuators was very effective. Proving similarity of cable from tested to installed was the main exception. Some of the arguments were weak or inconclusive.

When a lack of qualification was found, the Licensee has generally chosen to replace the device.

As with all reviews to date, problems were noted with many aging evaluations and programs.

On February 1, 1981, the Licensee provided the following response concerning TMI Action Plan equipment [15]:

STONE & WEBSTER ENGINEERING CORPORATION 10.2-1

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: AUXILIARY FEEDWATER

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
FT-FW-200A	Note 1	Flow Transmitter	x	
FT-FW-200B	Note 1	Flow Transmitter	x	
FT-FW-200C	Note 1	Flow Transmitter	x	

		TITLE	
CHECKED		VIRGINIA ELECTRIC AND POWER COMPANY	
CORRECT		SURRY UNIT 2	
APPROVED			
REVISIONS	(2) (3) (4) (5)		

Note 1: Refer to IE Bulletin 79-01B, pages 6-87, 6-88, and 6-89 of the 90-Day Review.

FIGURE SUPPLIED BY THE LICENSEE

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STONE & WEBSTER ENGINEERING CORPORATION 10.2-2

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: LEAKAGE MONITORING

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
PT-LM-201A	10.3-1	Pressure Transmitter		x
PT-LM-201B	10.3-2	Pressure Transmitter		x
PT-LM-200A	Note 1	Pressure Transmitter		x
PT-LM-200B	Note 1	Pressure Transmitter		x
PT-LM-200C	Note 1	Pressure Transmitter		x
PT-LM-200D	Note 1	Pressure Transmitter		x

		TITLE	
CHECKED		VIRGINIA ELECTRIC AND POWER COMPANY	
CORRECT		SURRY UNIT 2	
APPROVED			
REVISIONS	(2) (3) (4) (5)		

Note 1: Refer to IE Bulletin 79-01B, pages 6-128, 6-129, 6-130, 6-131 of the 90-Day Review.

FIGURE SUPPLIED BY THE LICENSEE

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STONE & WEBSTER ENGINEERING CORPORATION 10.2-3

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: PRIMARY PLANT VENT AND DRAINS

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
SOV-DA-203A	10.3-3	Solenoid Operated Valve		x
SOV-DA-203B	10.3-4	Solenoid Operated Valve		x
LT-DA-210A	10.3-5	Level Transmitter	x	
LT-DA-210B	10.3-6	Level Transmitter	x	
ZS-DA-203A for TV-DA-203A	10.3-7	Limit Switch		x
ZS-DA-203B for TV-DA-203B	10.3-8	Limit Switch		x

		TITLE						
CHECKED		VIRGINIA ELECTRIC AND POWER COMPANY						
CORRECT		SURRY UNIT 2						
APPROVED								
REVISIONS		(2)		(3)		(4)	(5)	

FIGURE SUPPLIED BY THE LICENSEE

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A Division of The Franklin Institute

STONE & WEBSTER ENGINEERING CORPORATION 10.2-4

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: REACTOR COOLANT

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
YE-VMS-200A-1	10.3-9	Accelerometer	x	
YE-VMS-200A-2	10.3-10	Accelerometer	x	
YE-VMS-200B-1	10.3-11	Accelerometer	x	
YE-VMS-200B-2	10.3-12	Accelerometer	x	
YE-VMS-200C-1	10.3-13	Accelerometer	x	
YE-VMS-200C-2	10.3-14	Accelerometer	x	
YE-VMS-201A-1	10.3-15	Accelerometer	x	
YE-VMS-201A-2	10.3-16	Accelerometer	x	
YE-VMS-201B-1	10.3-17	Accelerometer	x	
YE-VMS-201B-2	10.3-18	Accelerometer	x	
LOW NOISE CABLE	10.3-19	Hardline Coaxial Cable	x	

CHECKED		TITLE			
CORRECT		VIRGINIA ELECTRIC AND POWER COMPANY			
APPROVED		SURRY UNIT 2			
REVISIONS	(2)	(3)	(4)	(5)	

FIGURE SUPPLIED BY THE LICENSEE

Franklin Research Center
A Division of The Franklin Institute

STONE & WEBSTER ENGINEERING CORPORATION 10.2-5

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: REACTOR COOLANT

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
YY-VMS-200A-1	10.3-20	Remote Charge Preamplifier	x	
YY-VMS-200A-2	10.3-21	Remote Charge Preamplifier	x	
YY-VMS-200B-1	10.3-22	Remote Charge Preamplifier	x	
YY-VMS-200B-2	10.3-23	Remote Charge Preamplifier	x	
YY-VMS-200C-1	10.3-24	Remote Charge Preamplifier	x	
YY-VMS-200C-2	10.3-25	Remote Charge Preamplifier	x	
YY-VMS-201A-1	10.3-26	Remote Charge Preamplifier	x	
YY-VMS-201A-2	10.3-27	Remote Charge Preamplifier	x	
YY-VMS-201B-1	10.3-28	Remote Charge Preamplifier	x	
YY-VMS-201B-2	10.3-29	Remote Charge Preamplifier	x	

		TITLE	
CHECKED		VIRGINIA ELECTRIC AND POWER COMPANY	
CORRECT		SURRY UNIT 2	
APPROVED			
REVISIONS	(2) (3) (4) (5)		

FIGURE SUPPLIED BY THE LICENSEE

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STONE & WEBSTER ENGINEERING CORPORATION 10.2-6

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: RECIRCULATING SPRAY

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
LT-RS-251A	10.3-30	Level Transmitter	x	
LT-RS-251B	10.3-31	Level Transmitter	x	

CHECKED		TITLE			
CORRECT		VIRGINIA ELECTRIC AND POWER COMPANY			
APPROVED		SURRY UNIT 2			
REVISIONS	(2)	(3)	(4)	(5)	

FIGURE SUPPLIED BY THE LICENSEE

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STONE & WEBSTER ENGINEERING CORPORATION

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: POST-ACCIDENT SAMPLING SYSTEM

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
TV-SS-202A	10.3-32	Solenoid Operated Valve	x	
TV-SS-202B	10.3-33	Solenoid Operated Valve		x
TV-SS-206A	10.3-34	Solenoid Operated Valve	x	
TV-SS-206B	10.3-35	Solenoid Operated Valve		x
HCV-SS-201D	10.3-36	Solenoid Operated Valve	x	
HCV-SS-202A	10.3-37	Solenoid Operated Valve	x	
HCV-SS-200A	10.3-38	Solenoid Operated Valve	x	
HCV-SS-200B	10.3-39	Solenoid Operated Valve	x	
TV-SS-203A	10.3-40	Solenoid Operated Valve	x	
TV-SS-203B	10.3-41	Solenoid Operated Valve		x
ZS-SS-202A-1	10.3-42	Open Position Limit Switch for TV-SS-202A	x	

		TITLE	
CHECKED		VIRGINIA ELECTRIC AND POWER COMPANY	
CORRECT		SURRY UNIT 2	
APPROVED			
REVISIONS	(2) (3) (4) (5)		

Supplement 3
February 1, 1981

FIGURE SUPPLIED BY THE LICENSEE

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A Division of The Franklin Institute

STONE & WEBSTER ENGINEERING CORPORATION 10.2-8

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: POST-ACCIDENT SAMPLING SYSTEM

Plant Identification Number	Worksheet Page No.	Generic Name	Location: Inside Containment	Location: Outside Containment
ZS-SS-202A-2	10.3-43	Closed Position Limit Switch for TV-SS-202A	x	
ZS-SS-202B-1	10.3-44	Open Position Limit Switch for TV-SS-202B		x
ZS-SS-202B-2	10.3-45	Closed Position Limit Switch for TV-SS-202B		x
ZS-SS-206A-1	10.3-46	Open Position Limit Switch for TV-SS-206A	x	
ZS-SS-206A-2	10.3-47	Closed Position Limit Switch for TV-SS-206A	x	
ZS-SS-206B-1	10.3-48	Open Position Limit Switch for TV-SS-206B		x
ZS-SS-206B-2	10.3-49	Closed Position Limit Switch for TV-SS-206B		x
ZS-SS-201D-1	10.3-50	Open Position Limit Switch for HCV-SS-201D	x	
ZS-SS-201D-2	10.3-51	Closed Position Limit Switch for HCV-SS-201D	x	
ZS-SS-202A-3	10.3-52	Open Position Limit Switch for HCV-SS-202A	x	
ZS-SS-202A-4	10.3-53	Closed Position Limit Switch for HCV-SS-202A	x	

CHECKED		TITLE					
CORRECT		VIRGINIA ELECTRIC AND POWER COMPANY SURRY UNIT 2					
APPROVED							
REVISIONS		(2)		(3)		(4)	(5)

Supplement 3
February 1, 1981

FIGURE SUPPLIED BY THE LICENSEE

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STONE & WEBSTER ENGINEERING CORPORATION 10.2-9

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: POST-ACCIDENT SAMPLING SYSTEM

Plant Identification Number	Worksheet Page No.	Generic Name	Location: Inside Containment	Location: Outside Containment
ZS-SS-200A-1	10.3-54	Open Position Limit Switch for HCV-SS-200A	x	
ZS-SS-200A-2	10.3-55	Closed Position Limit Switch for HCV-SS-200A	x	
ZS-SS-200B-1	10.3-56	Open Position Limit Switch for HCV-SS-200B	x	
ZS-SS-200B-2	10.3-57	Closed Position Limit Switch for HCV-SS-200B	x	
ZS-SS-203A-1	10.3-58	Open Position Limit Switch for TV-SS-203A	x	
ZS-SS-203A-2	10.3-59	Closed Position Limit Switch for TV-SS-203A	x	
ZS-SS-203B-1	10.3-60	Open Position Limit Switch for TV-SS-203B		x
ZS-SS-203B-2	10.3-61	Closed Position Limit Switch for TV-SS-203B		x
S2-XCV-1402A	10.3-62	Solenoid Operated Valve		x
S2-XCV-1402B	10.3-63	Solenoid Operated Valve		x
S2-XCV-1423A	10.3-64	Solenoid Operated Valve		x

CHECKED		TITLE					
CORRECT		VIRGINIA ELECTRIC AND POWER COMPANY SURRY UNIT 2					
APPROVED							
REVISIONS		(2)	(3)	(4)	(5)		

Supplement 3
February 1, 1981

FIGURE SUPPLIED BY THE LICENSEE

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STONE & WEBSTER ENGINEERING CORPORATION 10.2-10

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: POST-ACCIDENT SAMPLING SYSTEM

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
S2-XCV-1423B	10.3-65	Solenoid Operated Valve		x
ZS-XCV-1402A-1	10.3-66	Open Position Limit Switch for S2-XCV-1402A		x
ZS-XCV-1402A-2	10.3-67	Closed Position Limit Switch for S2-XCV-1402A		x
ZS-XCV-1402B-1	10.3-68	Open Position Limit Switch for S2-XCV-1402B		x
ZS-XCV-1402B-2	10.3-69	Closed Position Limit switch for S2-XCV-1402B		x
ZS-XCV-1423A-1	10.3-70	Open Position Limit Switch for S2-XCV-1423A		x
ZS-XCV-1423A-2	10.3-71	Closed Position Limit Switch for S2-XCV-1423A		x
ZS-XCV-1423B-1	10.3-72	Open Position Limit Switch for S2-XCV-1423B		x
ZS-XCV-1423B-2	10.3-73	Closed Position Limit Switch for S2-XCV-1423B		x

CHECKED		TITLE						
CORRECT		VIRGINIA ELECTRIC AND POWER COMPANY SURRY UNIT 2						
APPROVED								
REVISIONS		(2)		(3)		(4)	(5)	

Supplement 3
February 1, 1981

FIGURE SUPPLIED BY THE LICENSEE

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MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: HYDROGEN ANALYZER

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
H2A-GW-201-1	10.3-74	Hydrogen Analyzer		x
H2A-GW-201-2	10.3-75	Analyzer Remote Control Module		x
TV-GW-200	10.3-76	Solenoid Operated Valve		x
TV-GW-201	10.3-77	Solenoid Operated Valve		x
TV-GW-202	10.3-78	Solenoid Operated Valve		x
TV-GW-203	10.3-79	Solenoid Operated Valve		x
TV-GW-204	10.3-80	Solenoid Operated Valve		x
TV-GW-205	10.3-81	Solenoid Operated Valve		x
TV-GW-206	10.3-82	Solenoid Operated Valve		x
TV-GW-207	10.3-83	Solenoid Operated Valve		x
ZS-GW-200-1	10.3-84	Open Position Limit Switch for TV-HC-200		x

CHECKED		TITLE					
CORRECT		VIRGINIA ELECTRIC AND POWER COMPANY					
APPROVED		SURRY UNIT 2					
REVISIONS		(2)	(3)	(4)	(5)		

Supplement 3
February 1, 1981

FIGURE SUPPLIED BY THE LICENSEE

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STONE & WEBSTER ENGINEERING CORPORATION 10.2-12

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: HYDROGEN ANALYZER

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
ZS-GW-200-2	10.3-85	Closed Position Limit Switch for TV-HC-200		x
ZS-GW-201-1	10.3-86	Open Position Limit Switch for TV-HC-201		x
ZS-GW-201-2	10.3-87	Closed Position Limit Switch for TV-HC-201		x
ZS-GW-202-1	10.3-88	Open Position Limit Switch for TV-HC-202		x
ZS-GW-202-2	10.3-89	Closed Position Limit Switch for TV-HC-202		x
ZS-GW-203-1	10.3-90	Open Position Limit Switch for TV-HC-203		x
ZS-GW-203-2	10.3-91	Closed Position Limit Switch for TV-HC-203		x
ZS-GW-204-1	10.3-92	Open Position Limit Switch for TV-HC-204		x
ZS-GW-204-2	10.3-93	Closed Position Limit Switch for TV-HC-204		x
ZS-GW-205-1	10.3-94	Open Position Limit Switch for TV-HC-205		x
ZS-GW-205-2	10.3-95	Closed Position Limit Switch for TV-HC-205		x

CHECKED		TITLE						
CORRECT		VIRGINIA ELECTRIC AND POWER COMPANY						
APPROVED		SURRY UNIT 2						
REVISIONS		(2)		(3)		(4)		(5)

Supplement 3
February 1, 1981

FIGURE SUPPLIED BY THE LICENSEE

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A Division of The Franklin Institute

MASTER LIST

Class IE Electrical Equipment Required to Function

Under Postulated Accident Conditions

SYSTEM: HYDROGEN ANALYZER

Plant Identification Number	Worksheet Page No.	Generic Name	Location	
			Inside Containment	Outside Containment
ZS-GW-206-1	10.3-96	Open Position Limit Switch for TV-HC-206		x
ZS-GW-206-2	10.3-97	Closed Position Limit Switch for TV-HC-206		x
ZS-GW-207-1	10.3-98	Open Position Limit Switch for TV-HC-207		x
ZS-GW-207-2	10.3-99	Closed Position Limit Switch for TV-HC-207		x

		TITLE						
CHECKED		VIRGINIA ELECTRIC AND POWER COMPANY						
CORRECT		SURRY UNIT 2						
APPROVED								
REVISIONS		(2)		(3)		(4)		(5)

Supplement 3
February 1, 1981

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6. REFERENCES

The references listed in this section of the report were used to develop the Equipment Environmental Qualification evaluation for this plant. The references have been separated into two lists: (1) Plant-Specific References and (2) Plant Generic References. All non-generic documents are listed on the "Plant-Specific References" list. All qualification documents that could be applicable to equipment installed in several plants were listed on the "Plant Generic References" list. These documents include topical reports, test reports, component and material analyses, etc. cited by the Licensee as evidence of qualification in accordance with the documentation reference instructions established by IE Bulletin 79-01B. Since these documents were compiled by a computer data base, the citation numbering was computer generated and the same document has the same generic reference number in all Technical Evaluation Reports prepared under this equipment qualification program.

Throughout the text of the report, references are designated by a bracketed number; the reference numbers are not presented in sequential order.

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Virginia Electric & Power Co., 29-Sep-78
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Collyer Insulated Wire Co., 16-Dec-70
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NUS Corp., 26-Oct-81
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NUS Corp., 16-Oct-81
QDR-5437-134-01, Rev. 1

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NUS Corp.
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Comsip, Inc., 25-Jan-80

101. Surry Power Station Units 1 & 2; Equipment Qualification Master Lists
Virginia Electric & Power Co., 14-Apr-82

102. 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; Virginia Electric and Power Company, Surry Unit 2
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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 submittal [18, 20].

Accident Conditions Inside Primary Containment

For PWR plants, the DOR Guidelines state that the environmental service conditions inside containment for the loss-of-coolant accident (LOCA) should be established by the Licensee based on the FSAR analysis. In addition, for plants equipped with automatic containment spray systems not subject to single component failure or delayed initiation, the Guidelines state that equipment qualified for the LOCA environment is also considered qualified for the postulated main-steam-line break accident (MSLB). The design of this plant satisfies these criteria. The Licensee has stated that equipment qualified for a LOCA environment can be considered qualified for a MSLB accident environment.

The 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 environmental information [20]:

Figure A-1. Auxiliary Building Penetration Area, Elev. 2'0"

Figure A-2. Auxiliary Building Charging Pump Cubicles, Elev. 2'0"

Figure A-3. Auxiliary Building, General, Elev. 13'0"

Figure A-4. Auxiliary Building Cable Vault, Elev. 13'0"

Figure A-5. Auxiliary Building, General, Elev. 27'6" (excluding cont. vacuum pump cubicles)

Figure A-6. Auxiliary Building, General, Elev. 45'10"

Figure A-7. Containment Spray Pump House, Elev. 11'6"

Figure A-8. Containment Spray Pump House, Elev. 27'6"

Figure A-9. Main Steam Valve House, General, Elev. 11'6"

Figure A-10. Main Steam Valve House, General, Elev. 27'6"

Figure A-11. Containment Inside Cranewall, Elev. (-)3'6"

Figure A-12. Containment Outside Cranewall, Elev. (-)3'6"

Figure A-13. Containment Outside Cranewall, Elev. 18'4"

Figure A-14. Containment, General, Elev. (-)27'7"

Figure A-15. Containment, Elev. (-)27'7" Submerged (Below (-)21'11")

Figure A-16. Containment Inside Cranewall, Elev. 47'4"

Figure A-17. Containment Outside Cranewall, Elev. 47'4"

Figure A-18. Mechanical Equipment Room 3

Figure A-19. Safeguards Area

Figure A-20. Turbine Building, General, Elev. 9'6"

Figure A-21. Turbine Building, Mezzanine Level

Figure A-22. Environmental Qualification of Electrical Equipment Zone Key Plan.

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 Reference 20 as follows:

> "The Environmental Zone Description (EZD) documents the specification of parameters for environmentally harsh areas of the Surry Power Station Units 1 & 2 which contain safety-related equipment (IE Bulletin 79-01B). These areas have been ascribed environmental zones which possess more or less uniform environments relating to temperature, pressure, relative humidity, chemical spray, radiation, and submergence. As applicable for each environmental zone, these environmental parameters are specified for normal operation as well as LOCA, MSLB, and HELB conditions.

In certain instances, it was desirable to determine for specific plant components and environmental parameters a specification for an area contained within an environmental zone (i.e., temperature stratification and radiation zones).

Each environmental zone is described on a zone sheet (EZD pages 3 through 23). Reference numbers appearing on the zone sheets are identified by the reference list (EZD pages 24 through 25). The reference list also identified secondary references which support/supplement the primary references. A copy of each of both types of references is provided in the succeeding volumes of the EZD.

Primary references have numerical tabs which correspond to their respective reference numbers, whereas secondary references have alphabetical tabs. Immediately preceeding each primary reference is one or more pages of the user's guide; the user's guide identifies the specific pages of each primary reference where information from the zone sheet can be located."

With respect to primary containment service conditions, the Licensee stated [18]:

"A description of the containment spray systems at Surry is provided in Section 6.3.1.4 of the Surry FSAR. This system contains redundant 100% capacity trains which are not subjected to a disabling single-component failure."

The Licensee also provided the following response with respect to temperature margins applied to the primary containment accident profile [18]:

"Stratification would only be present for a short time period (since the containment spray system becomes effective within 100 seconds) following a LOCA or MSLB. The spray delivery to the upper regions of the containment would quickly cool the stratified region.

No safety-related electrical equipment is located in the upper third of the containment volume. This precludes any equipment from being exposed to a higher-than-average temperature due to stratification in the upper regions of the containment following a LOCA or MSLB.

Even if safety related electrical equipment were located in the upper third of the containment volume, the computer codes and models used to calculate the maximum containment average temperature of 278°F for LOCA contain significant conservatisms such that the calculated temperature is an overprediction of the expected average temperature. These conservatisms include:

(1) the blowdown model, which maximizes release rates to the containment

(2) overprediction of the energy available for release to the containment

(3) underprediction of the containment heat sinks and containment volume

(4) assuming the most severe containment initial conditions

(5) minimizing containment spray heat removal

(6) the modeling of the behavior of the break effluent to maximize the containment pressure and temperature.

The combination of all these factors results in calculated containment pressure and temperature transients which are substantially greater than expected values. Therefore, there is sufficient margin in the calculated temperature to account for stratified regions of higher-than-average temperatures for an MSLB.

Stratification of steam in the upper regions of the containment is not expected to occur after a LOCA. The location of the break is below the operating floor in the lower portion of the containment. The high, subcooled liquid blowdown rates will result in a high degree of mixing which will prevent the accumulation of stratified steam.

A sample of the methodology used to determine the inside containment LOCA profiles can be found in the Environmental Zone Descriptions for Surry Power Station behind Reference Tab #2.[1]

[1]A copy of the Environmental Zone Descriptions (EZD) Surry Power Stations Units 1 and 2 are provided with the SER response."

With regard to submergence inside containment, the Licensee stated [18]:

"1. Inside Reactor Containment Building

The methodology used to determine the submergence level inside containment is provided for your review in the Environmental Zone Descriptions for Surry Power Station behind Reference Tab #6. This methodology is in accordance with the requirements of I.E. Bulletin 79-01B.

The maximum fluid level in the calculation is elevation -21'11" to which all components were reviewed. The 6 motor operated valves (MOV 1865 A, B, C and MOV 2865 A, B, C) are below the submergence level.

These motor operated valves have been removed from the master list. The valves serve to isolate the safety injection accumulator tanks during refueling. They are administratively locked open whenever the reactor is critical by locking out the breakers that supply power to the valves. The valves will then remain in their locked open position and available to mitigate the consequences of a LOCA or MSLB. No power is supplied to these motor operated valves during

critical operation; therefore, there can be no adverse effects to the electrical bus which normally supplies power to the valves. There is no position indication on these valves, thus the operator cannot be misled due to the submergence of the valves. Since the valves are locked open, the question of operating time across the spectrum of events in relation to submergence need not be addressed."

With regard to submergence outside containment, the Licensee stated [18]:

"2. Outside Reactor Containment Building

Submergence outside of containment was not specifically addressed during the I.E. Bulletin 79-01B 90 Day Review. The effects of piping system breaks outside of containment was analyzed in Appendix D of the Surry FSAR. This review takes into account the effects of discharging fluids that may result in failure of equipment important to safety.

A detailed review of the effects of flooding on equipment important to safety is provided in the North Anna FSAR Appendix C, Effects of Piping System Breaks Outside Containment. The Auxiliary Building was the only area affected by the postulated high-energy line breaks with regard to submergence. The maximum water level in the Auxiliary Building is 1 inch above the floor. All equipment important to safety was found to be at least 15 inches above the floor.

A similar review of the effects of flooding was not done for Surry. We can determine for Surry, however, that no equipment outside of containment important to safety will become submerged due to the postulated pipe breaks because of the similarity in design of the piping systems, the Auxiliary Building layout, and equipment location for North Anna and Surry.

Since we have determined that there is no equipment outside containment that would be subjected to submergence due to a LOCA or HELB, the submergence column on the Component Evaluation Sheet has been marked Not Required (NR)."

With regard to chemical spray, the Licensee stated [18]:

"The component evaluation sheets have been revised to show consistent units for chemical spray concentration. Each component on the master list which is subjected to chemical sprays has been reviewed to ensure that the chemical spray environment in the test report envelops the specified chemical spray environment. The results of the review are indicated on the worksheets included in Revision 4 of the IE Bulletin 79-01B 90 Day Review. Specific chemical spray deficiencies which were identified in Appendix B have also been reviewed and resolutions to these deficiencies are indicated on the Revision 4 component evaluation worksheets.

Details of the qualification review for chemical spray can be found in the qualification review packages contained in the central file."

With respect to radiation values inside primary containment, the Licensee stated [18]:

"The calculated total integrated gamma radiation doses inside containment range from 7.4×10^6 to 3.8×10^7 rads, depending on the location of the dose points. They are shown in Table 2. The radiation doses were calculated based on power level of 2546 MW thermal and containment free volume of 1.8×10^6 ft^3. The shielding credit of crane wall and operating floor was taken into consideration. A sample calculation is provided in the Environmental Zone Descriptions for Surry Power Station behind Reference Tab #3.

TABLE 2

40-year normal plus LOCA gamma dose inside containment

Location		Dose (rads)
el. 47'4"	- Inside crane wall	3.7×10^7
el. 47'4"	- Outside crane wall	7.4×10^6
el. 18'4"	- Outside crane wall	7.4×10^6
el. (-) 3'6"	- Inside crane wall	3.7×10^7
el. (-) 3'6"	- Outside crane wall	7.4×10^6
el. (-)27'7"	- Above sump water	3.5×10^7
el. (-)27'7"	- Submerged in sump water	3.8×10^7"

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: AB-2B
DESCRIPTION: Auxiliary Building Penetration Area, Elev. 2'0"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Occupied spaces, 100F Normally unoccupied machinery spaces, 120F	14	NA	_____	NA	_____	120-205F, 0-30 secs 205F, 30-40 secs 205-190F, 40-1000 secs 190-145F, 1000-2000 secs 145-120F, 2000 secs-1 hr	4
PRESSURE (psia)	NA	_____	NA	_____	NA	_____	15.2, 0-1 min 14.9, 1-60 min	4
RELATIVE HUMIDITY (%)	NC	_____	NA	_____	NA	_____	100	4
CHEMICAL SPRAY	NA	_____	NA	_____	NA	_____	NA	_____
RADIATION (rads)	2.5 x 10⁴	7	2.5 x 10⁴	7	NA	_____	NA	_____
SUBMERGENCE (elev)	NA	_____	NA	_____	NA	_____	Note	_____

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

NOTE: Not applicable. No safety-related electrical equipment will be affected by the submergence level at the 2'0" elevation of the Auxiliary Building.

Figure A-1. Auxiliary Building Penetration Area, Elev. 2'0"

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: AB-2C
DESCRIPTION: Auxiliary Building Charging Pump Cubicles, Elev. 2'0"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Normally unoccupied machinery spaces, 120F	14	NA	_____	NA	_____	120-140F, 0-30 secs 140F, 30-1000 secs 140-125F, 1000-2000 secs 125-120F, 2000 secs-1 hr	4
PRESSURE (psia)	NA	_____	NA	_____	NA	_____	15.2, 0-1 min 14.9, 1-60 min	4
RELATIVE HUMIDITY (%)	NC	_____	NA	_____	NA	_____	100	4
CHEMICAL SPRAY	NA	_____	NA	_____	NA	_____	NA	_____
RADIATION (rads)	2.7 x 10⁴	7	3.0 x 10⁴	7	NA	_____	NA	_____
SUBMERGENCE (elev)	NA	_____	NA	_____	NA	_____	NOTE	_____

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

NOTE: Not applicable. No safety related electrical equipment will be affected by the submergence level at the 2'0" elevation of the Auxiliary Building.

Figure A-2. Auxiliary Building Charging Pump Cubicles, Elev. 2'0"

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: AB-13A
DESCRIPTION: Auxiliary Building, General, Elev. 13'0"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Occupied spaces, 100F Normally unoccupied machinery spaces, 120F	14	NA	_____	NA	_____	120-205F, 0-30 secs 205F, 30-40 secs 205-190F, 40-1000 secs 190-145F, 1000-2000 secs 145-120F, 2000 secs-1hr	4
PRESSURE (psia)	NA	_____	NA	_____	NA	_____	15.2, 0-1 min 14.9, 1-60 min	4
RELATIVE HUMIDITY (%)	NC	_____	NA	_____	NA	_____	100	4
CHEMICAL SPRAY	NA	_____	NA	_____	NA	_____	NA	_____
RADIATION (rads)	NOTE	10	9.3×10^5	10	NA	_____	NA	_____
SUBMERGENCE (elev)	NA	_____	NA	_____	NA	_____	NA	_____

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

NOTE: The radiation dose of 2.66×10^7 for the 40-yr normal operation in zone AB-13A is caused by the primary drain tank and gas stripper located in radiation zone Q (Units 1 & 2). The radiation dose is calculated to be 4.87×10^3 in radiation zones O (Unit 1) and N (Unit 2) and 1.40×10^5 in radiation zones T (Unit 1) and S (Unit 2).

Figure A-3. Auxiliary Building, General, Elev. 13'0"

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: AB-13B
DESCRIPTION: Auxiliary Building Cable Vault, Elev. 13'0"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Normally unoccupied machinery spaces, 120F	14	NA	_____	NA	_____	NA	_____
PRESSURE (psia)	NA	_____	NA	_____	NA	_____	NA	_____
RELATIVE HUMIDITY (%)	NC	_____	NA	_____	NA	_____	NA	_____
CHEMICAL SPRAY	NA	_____	NA	_____	NA	_____	NA	_____
RADIATION (rads)	1.96 x 10⁴	10	3.2 x 10⁴	10	NA	_____	NA	_____
SUBMERGENCE (elev)	NA	_____	NA	_____	NA	_____	NA	_____

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-4. Auxiliary Building Cable Vault, Elev. 13'0"

FIGURE SUPPLIED BY THE LICENSEE

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: AB-27
DESCRIPTION: Auxiliary Building, General Elev. 27'6" (excluding cont. vacuum pump cubicles)

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Occupied spaces, 100F Normally unoccupied machinery spaces, 120F	14	NA		NA		120-205F, 0- 30 secs 205F, 30-40 secs 205-190F, 40-1000 secs 190-145F, 1000-2000 secs 145-120F, 2000 secs-1 hr	4
PRESSURE (psia)	NA		NA		NA		15.2, 0-1 min 14.9, 1-60 min	4
RELATIVE HUMIDITY (%)	NC		NA		NA		100	4
CHEMICAL SPRAY	NA		NA		NA		NA	
RADIATION (rads)	1.3×10^4	10	6.8×10^2	10	NA		NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-5. Auxiliary Building, General, Elev. 27'6" (excluding cont. vacuum pump cubicles)

FIGURE SUPPLIED BY THE LICENSEE

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ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: AB-45
DESCRIPTION: Auxiliary Building, General, Elev. 45'10"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Occupied spaces, 100F Normally unoccupied machinery spaces, 120F	14	NA		NA		120-125F, 0-300 secs 125-122F, 300-2000 secs 122-120F, 2000 secs-1 hr	4
OPRESSURE (psia)	NA		NA		NA		15.2, 0-1 min 14.9, 1-60 min	4
RELATIVE HUMIDITY (%)	NC		NA		NA		100	4
CHEMICAL SPRAY	NA		NA		NA		NA	
RADIATION (rads)	1.1×10^5	10	2.7×10^5	10	NA		NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-6. Auxiliary Building, General, Elev. 45'10"

FIGURE SUPPLIED BY THE LICENSEE

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: CSPH-11
DESCRIPTION: Containment Spray Pump House, Elev. 11'6"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Occupied spaces, 100F Normally un-occupied machinery spaces, 120F	14	NA		NA		NA	
PRESSURE (psia)	NA		NA		NA		NA	
RELATIVE HUMIDITY (%)	NC		NA		NA		NA	
CHEMICAL SPRAY	NA		NA		NA		NA	
RADIATION (rads)	8.8×10^2	11	5.9×10^4	11	NA		NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-7. Containment Spray Pump House, Elev. 11'6"

FIGURE SUPPLIED BY THE LICENSEE

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ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: CSPH-27
DESCRIPTION: Containment Spray Pump House, Elev. 27'6"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Occupied spaces, 100F Normally un-occupied machinery spaces, 120F	14	NA		NA		NA	
PRESSURE (psia)	NA		NA		NA		NA	
RELATIVE HUMIDITY (%)	NC		NA		NA		NA	
CHEMICAL SPRAY	NA		NA		NA		NA	
RADIATION (rads)	8.6×10^2	11	5.3×10^2	11	NA		NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-8. Containment Spray Pump House, Elev. 27'6"

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: MSVH-11
DESCRIPTION: Main Steam Valve House, General, Elev. 11'6"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Normally unoccupied machinery spaces, 120F	14	NA		NA		NA	
PRESSURE (psia)	NA		NA		NA		NA	
RELATIVE HUMIDITY (%)	NC		NA		NA		NA	
CHEMICAL SPRAY	NA		NA		NA		NA	
RADIATION (rads)	8.8×10^2	11	5.9×10^4	11	NA		NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-9. Main Steam Valve House, General, Elev. 11'6"

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: MSVH-27
DESCRIPTION: Main Steam Valve House, General, Elev. 27'6"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Normally unoccupied machinery spaces, 120F	14	NA		NA		Note	12
PRESSURE (psia)	NA		NA		NA		16.5, 0-10 sec 16.2, 10 sec-1 hr	12
RELATIVE HUMIDITY (%)	NC		NA		NA		100	12
CHEMICAL SPRAY	NA		NA		NA		NA	
RADIATION (rads)	8.8×10^2	11	1.7×10^4	11	NA		NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

NOTE: The HELB temperature of 300°F (0-1 hr) was calculated for environmental zone MSVH-27 which extends from elevation 27'6" to the roof. The HELB temperature for equipment located between elevations 27'6" and 38'0" is calculated to be 250°F (0-1 hr).

Figure A-10. Main Steam Valve House, General, Elev. 27'6"

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: RC-3A
DESCRIPTION: Containment Inside Cranewall, Elev. (-)3'6"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Design, 105F Maximum, 125F	15 1	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	NA	
PRESSURE (psia)	9.0-11.1	1	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	NA	
RELATIVE HUMIDITY (%)	NC		100, 0-120 days	2	100, 0-120 days	2	NA	
CHEMICAL SPRAY	NA		Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	NA	
RADIATION (rads)	1.3×10^7	3	$\leq 2.4 \times 10^7$	3	$\leq 2.4 \times 10^7$	3,5	NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in reference columns are identified at the end of this section.

Figure A-11. Containment Inside Cranewall, Elev. (-)3'6"

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: RC-3B
DESCRIPTION: Containment Outside Cranewall, Elev. (-)3'6"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Design, 105F Maximum, 125F	15 1	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	NA	
PRESSURE (psia)	9.0-11.1	1	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	NA	
RELATIVE HUMIDITY (%)	NC		100, 0-120 days	2	100, 0-120 days	2	NA	
CHEMICAL SPRAY	NA		Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	NA	
RADIATION (rads)	3.5×10^4	3	7.4×10^4	3	$<7.4 \times 10^4$	3,5	NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-12. Containment Outside Cranewall, Elev. (-)3'6"

FIGURE SUPPLIED BY THE LICENSEE

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: RC-18B
DESCRIPTION: Containment Outside Cranewall, Elev. 18'4"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Design, 105F Maximum, 125F	15 1	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	NA	
PRESSURE (psia)	9.0-11.1	1	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	NA	
RELATIVE HUMIDITY (%)	NC		100, 0-120 days	2	100, 0-120 days	2	NA	
CHEMICAL SPRAY	NA		Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	NA	
RADIATION (rads)	3.5×10^4	3	7.4×10^4	3	$<7.4 \times 10^4$	3,5	NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-13. Containment Outside Cranewall, Elev. 18'4"

FIGURE SUPPLIED BY THE LICENSEE

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ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: RC-27A
DESCRIPTION: Containment General, Elev. (-)27'7"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Design, 105F Maximum, 125F	15 1	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	NA	
PRESSURE (psia)	9.0-11.1	1	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	NA	
RELATIVE HUMIDITY (%)	NC		100, 0-120 days	2	100, 0-120 days	2	NA	
CHEMICAL SPRAY	NA		Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	NA	
RADIATION (rads)	3.5×10^4	3	3.5×10^7	3	$<3.5 \times 10^7$	3,5	NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-14. Containment, General, Elev. (-)27'7"

FIGURE SUPPLIED BY THE LICENSEE

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ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: RC-27B*
DESCRIPTION: Containment, Elev. (-)27'7" Submerged (Below (-)21'11")

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Design, 105F Maximum, 125F	15 1	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	NA	
PRESSURE (psia)	9.0-11.1	1	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	NA	
RELATIVE HUMIDITY (%)	NC		100, 0-120 days	2	100, 0-120 days	2	NA	
CHEMICAL SPRAY	NA		Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	NA	
RADIATION (rads)	3.5×10^4	3	3.8×10^7	3	$<3.8 \times 10^7$	3,5	NA	
SUBMERGENCE (elev)	NA		(-)21'11"	6	(-)21'11"	6	NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

* No safety-related electrical equipment is contained in environmental zone RC-27B.

Figure A-15. Containment, Elev. (-)27'7" Submerged (Below (-)21'11")

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: RC-47A
DESCRIPTION: Containment Inside Cranewall, Elev. 47'4"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Design, 105F Maximum, 125F	15 1	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	NA	
PRESSURE (psia)	9.0-11.1	1	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	NA	
RELATIVE HUMIDITY (%)	NC		100, 0-120 days	2	100, 0-120 days	2	NA	
CHEMICAL SPRAY	NA		Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	NA	
RADIATION (rads)	<1.3 x 10^7	3	2.4 x 10^7	3	<2.4 x 10^7	3,5	NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-16. Containment Inside Cranewall, Elev. 47'4"

FIGURE SUPPLIED BY THE LICENSEE

Facility: VePCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: RC-47B
DESCRIPTION: Containment Outside Cranewall, Elev. 47'4"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Design, 105F Maximum, 125F	15 1	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	280F, 0-30 min 280-150F, 30-60 min 150-120F, 1-48 hr 120F, 2-120 days	2	NA	
PRESSURE (psia)	9.0-11.1	1	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	59.7, 0-30 min 59.7-14.7, 30-60 min 14.7-12.7, 1-48 hr 12.7, 2-120 days	2	NA	
RELATIVE HUMIDITY (%)	NC		100, 0-120 days	2	100, 0-120 days	2	NA	
CHEMICAL SPRAY	NA		Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	Solution of 2000-2200 ppm H_3BO_3 buffered with NaOH to pH of 8.5-11, 0-4 hr Same solution with pH of between 8.0 and 9.5, 4 hr-120 days	2	NA	
RADIATION (rads)	3.5×10^4	3	7.4×10^4	3	$<7.4 \times 10^4$	3,5	NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-17. Containment Outside Cranewall, Elev. 47'4"

FIGURE SUPPLIED BY THE LICENSEE

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ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: SB-9B
DESCRIPTION: Mechanical Equipment Room 3

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Occupied spaces, 100F Normally unoccupied machinery spaces, 120F	14	NA		NA		310F, 0-30 min 310-130F, 30-60 min	8
PRESSURE (psia)	NA		NA		NA		15.0	8
RELATIVE HUMIDITY (%)	NC		NA		NA		100	8
CHEMICAL SPRAY	NA		NA		NA		NA	
RADIATION (rads)	<2500	11	<2500	13	NA		NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-18. Mechanical Equipment Room 3

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: SPGD-1
DESCRIPTION: Safeguards Area

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Occupied spaces, 100F Normally un-occupied machinery spaces, 120F	14	NA		NA		NA	
PRESSURE (psia)	NA		NA		NA		NA	
RELATIVE HUMIDITY (%)	NC		NA		NA		NA	
CHEMICAL SPRAY	NA		NA		NA		NA	
RADIATION (rads)	8.8×10^2	7	8.0×10^4	9	NA		NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-19. Safeguards Area

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: TB-9
DESCRIPTION: Turbine Building, General, Elev. 9'6"

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	HELB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Occupied spaces, 100F Normally unoccupied machinery spaces, 120F	14	NA		NA		310F, 0-30 min 310-330F, 30-60 min	8
PRESSURE (psia)	NA		NA		NA		15.0	8
RELATIVE HUMIDITY (%)	NC		NA		NA		100	8
CHEMICAL SPRAY	NA		NA		NA		NA	
RADIATION (rads)	<2500	11	<2500	13	NA		NA	
SUBMERGENCE (elev)	NA		NA		NA		NA	

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-20. Turbine Building, General, Elev. 9'6"

FIGURE SUPPLIED BY THE LICENSEE

ENVIRONMENTAL ZONE DESCRIPTION SHEET

Facility: VEPCO, SURRY
Units: 1 and 2
Dockets: 50-280 and 50-281

ZONE: TB-35
DESCRIPTION: Turbine Building, Mezzanine Level

PARAMETER	NORMAL ENVIRONMENT	REFERENCE	LOCA ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE	MSLB ENVIRONMENT	REFERENCE
TEMPERATURE (°F)	Occupied spaces, 100F Normally unoccupied machinery spaces, 120F	14	NA	_____	NA	_____	310F, 0-30 min 310-130F, 30-60 min	8
PRESSURE (psia)	NA	_____	NA	_____	NA	_____	15.0	8
RELATIVE HUMIDITY (%)	NC	_____	NA	_____	NA	_____	100	8
CHEMICAL SPRAY	NA	_____	NA	_____	NA	_____	NA	_____
RADIATION (rads)	<2500	11	<2500	13	NA	_____	NA	_____
SUBMERGENCE (elev)	NA	_____	NA	_____	NA	_____	NA	_____

NA = Not applicable. NC = Not calculated. Numbers appearing in Reference columns are identified at the end of this section.

Figure A-21. Turbine Building, Mezzanine Level

FIGURE SUPPLIED BY THE LICENSEE

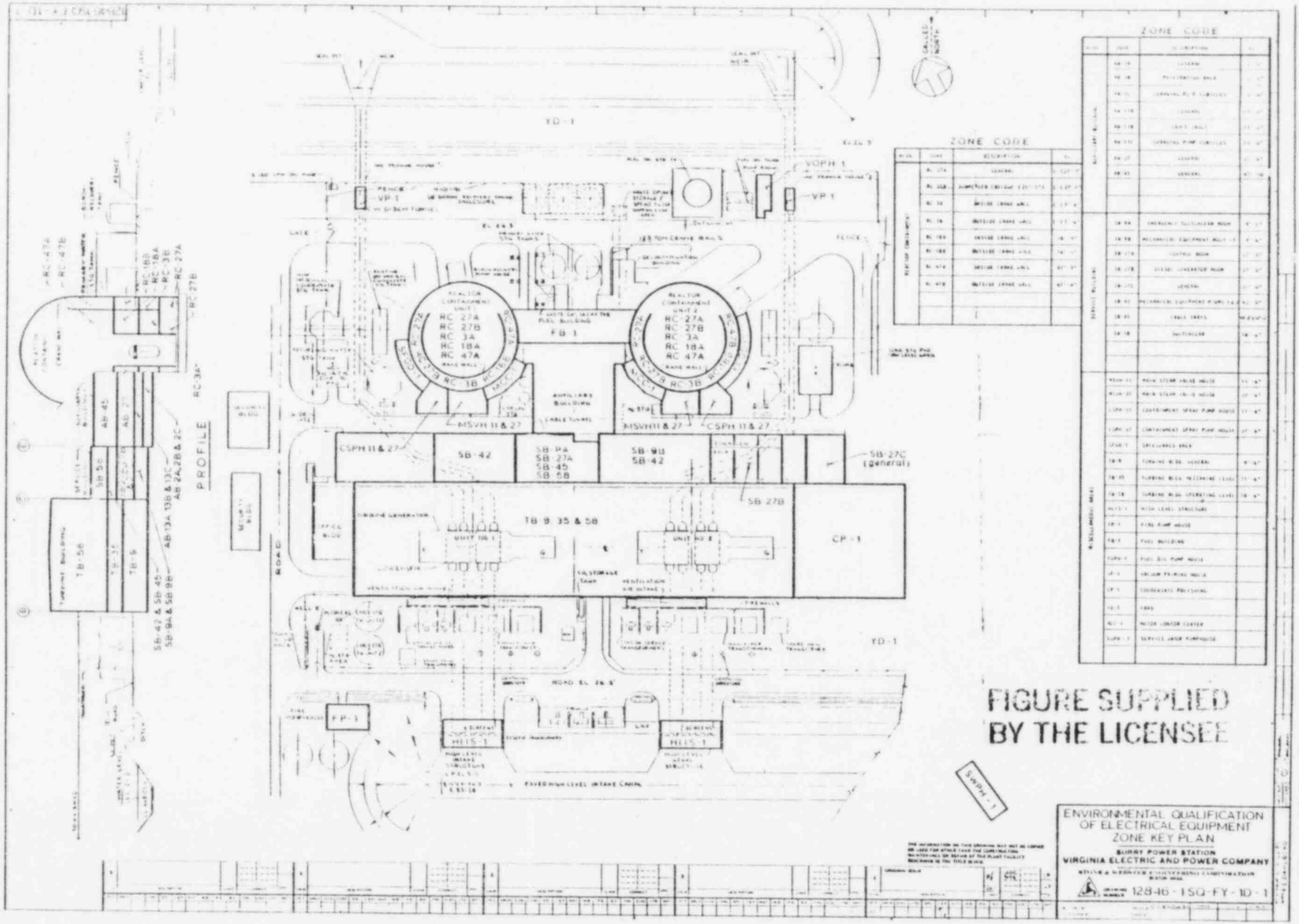

Figure A-22. Environmental Qualification of Electrical Equipment Zone Key Plan

APPENDIX B - LISTING OF SAFETY-RELATED ELECTRICAL EQUIPMENT

The following table lists the groupings of safety-related electrical equipment items for Surry Power Station Unit 2. Equipment items provided in the table are used in the detailed equipment environmental qualification evaluation presented in Section 4.4 and summarized in Section 4.2. This table was generated from the lists of equipment provided by the Licensee [15, 18].

The Licensee identified an extensive list of safety-related electrical equipment in various locations of the plant. The equipment listed by the Licensee was analyzed, and all identical equipment located within plant areas that are exposed to the same environmental service conditions was grouped together and designated an "equipment item." In this report, the term "equipment item" refers to a specific type of electrical equipment, designated by manufacturer and model, which is representative of all identical equipment in a plant area exposed to the same environmental service conditions (e.g., Flow Transmitter, Fischer & Porter, Model 10B2496, located within containment). This analysis resulted in a reduced listing of equipment (equipment items) that formed the basis for the review. This appendix contains the tabulation of the equipment items, locations, function, plant identification numbers, required operating time, and applicable qualification documentation references.

EQUIPMENT ITEM NO. 1
PRESSURE TRANSMITTER LOCATED IN THE SAFEGUARD AREA (SFGD-1)
FISCHER AND PORTER MODEL 50EP1031BCXA
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 1
LICENSEE REFERENCE(S): NOT CITED
FUNCTION PLANT (ID): OUTSIDE REACTOR SUMP PUMP DISCHARGE (PT-RS-256A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-278, -279

EQUIPMENT ITEM NO. 2
PRESSURE TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ROSEMOUNT MODEL 1153AGD9 XM54854
REQUIRED OPERATING TIME: NOT SPECIFIED
TER CHECKSHEET NO. 2
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): REACTOR COOLANT SYSTEM WIDE RANGE PRESSURE (PT-2402; PT-RC-2402-1)
LICENSEE SUBMITTAL: SCEW(S): 6-273, -274

EQUIPMENT ITEM NO. 3
PRESSURE TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
FISCHER AND PORTER MODEL 50EP1041BCXANS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 3
LICENSEE REFERENCE(S): 1584
FUNCTION (PLANT ID): PRESSURIZER PRESSURE INDICATION AND HIGH/LOW PROTECTION (PT-2455 TO -2457)
LICENSEE SUBMITTAL: SCEW(S): 6-185 TO -187

EQUIPMENT ITEM NO. 4
PRESSURE TRANSMITTER LOCATED IN THE TURBINE BUILDING (TB-35)
FISCHER AND PORTER MODEL 50EP1041BCXANS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 4
LICENSEE REFERENCE(S): 1584
FUNCTION (PLANT ID): STEAM HEADER PRESSURE (PT-2464, -2466, -2468)
LICENSEE SUBMITTAL: SCEW(S): 6-148 TO -150

EQUIPMENT ITEM NO. 5
PRESSURE TRANSMITTER LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-27)
FISCHER AND PORTER MODEL 50EP1041BCXANS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 5
LICENSEE REFERENCE(S): 1584
FUNCTION (PLANT ID): STEAM GENERATOR STEAM PRESSURE (PT-2474 TO -2476, -2484 TO 2486, -2494 TO 2496)
LICENSEE SUBMITTAL: SCEW(S): 6-151 TO -159

EQUIPMENT ITEM NO. 6
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING (AB-13A (N))
FISCHER AND PORTER MODEL 50EN1071BCXA
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 6
LICENSEE REFERENCE(S): 1584
FUNCTION (PLANT ID): REACTOR CONTAINMENT PRESSURE (PT-LM-200A, B, C, D)
LICENSEE SUBMITTAL: SCEW(S): 6-128 TO -131

EQUIPMENT ITEM NO. 7
ELECTRICAL PENETRATION LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
AMPHENOL MODEL TYPE III
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 7
LICENSEE REFERENCE(S): 5329, 1167, 5288, 4005, 3190, 74
FUNCTION (PLANT ID): SUPPLIES SERVICE TO SAFETY SYSTEM (NUS-41 S.N. 65/1065)
LICENSEE SUBMITTAL: SCEW(S): 6-46

EQUIPMENT ITEM NO. 8
ELECTRICAL PENETRATION LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
AMPHENOL MODEL TYPE 1C
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 8
LICENSEE REFERENCE(S): 5329, 1167, 5288, 4005, 3190, 74
FUNCTION (PLANT ID): SUPPLIES POWER TO SAFETY SYSTEM (NUS-41 S.N. 65/1065)
LICENSEE SUBMITTAL: SCEW(S): 6-45

EQUIPMENT ITEM NO. 9
ELECTRICAL PENETRATION LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
AMPHENOL MODEL TYPE 1B
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 9
LICENSEE REFERENCE(S): 5329, 1167, 5288, 4005, 3190, 74
FUNCTION (PLANT ID): SUPPLIES POWER TO SAFETY SYSTEMS (NUS-41 S.N. 65/1065)
LICENSEE SUBMITTAL: SCEW(S): 6-44

EQUIPMENT ITEM NO. 10
ELECTRICAL PENETRATION LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
AMPHENOL MODEL TYPE IA
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 10
LICENSEE REFERENCE(S): 5329, 1167, 5288, 4005, 3190, 74
FUNCTION (PLANT ID): ELECTRICAL CONTINUITY THROUGH CONTAINMENT WALL (NUS-41 S.N. 65/1065)
LICENSEE SUBMITTAL: SCEW(S): 6-43

EQUIPMENT ITEM NO. 11
ELECTRICAL PENETRATION LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
CONAX, MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 11
LICENSEE REFERENCE(S): 1049, 51
FUNCTION (PLANT ID): SUPPLIES POWER TO SAFETY SYSTEM (NAS-21 NA-313/1313)
LICENSEE SUBMITTAL: SCEW(S): 6-27 TO -31

EQUIPMENT ITEM NO. 12
FLOW TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-27B)
BARTON MODEL 386
REQUIRED OPERATING TIME: NOT SPECIFIED
TER CHECKSHEET NO. 12
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): COLD LEG SAFETY INJECTION (FT-2961 TO -2963)
LICENSEE SUBMITTAL: SCEW(S): 6-280 TO -282

EQUIPMENT ITEM NO. 13
FLOW TRANSMITTER LOCATED IN THE SAFEGUARD AREA (SFGD-1)
ROSEMOUNT MODEL 1152DP5
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 13
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): LOW HEAD INJECTION HEADER (FT-2945, -2946)
LICENSEE SUBMITTAL: SCEW(S): 6-283, -284

EQUIPMENT ITEM NO. 14
FLOW TRANSMITTER LOCATED IN THE AUXILIARY BUILDING (AB-2B)
FISCHER AND PORTER MODEL 10B2496QBNS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 14
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING FLOW/MINIMUM BORATION (FT-2122)
LICENSEE SUBMITTAL: SCEW(S): 6-11

EQUIPMENT ITEM NO. 15
FLOW TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-47B)
FISCHER AND PORTER MODEL 10B2496PB
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 15
LICENSEE REFERENCE(S): 687
FUNCTION (PLANT ID): AUXILIARY FEEDWATER FLOW (SG1A, B, C) (FT-FW-200A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-87 TO -89

EQUIPMENT ITEM NO. 16
LEVEL TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ROSEMOUNT MODEL 1153ADP5 XM54854
REQUIRED OPERATING TIME: NOT SPECIFIED
TER CHECKSHEET NO. 16
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): STEAM GENERATOR WIDE RANGE LEVEL (LT-2477, -2787, -2497)
LICENSEE SUBMITTAL: SCEW(S): 6-275 TO -277

EQUIPMENT ITEM NO. 17
LEVEL TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL
GEMS MODEL XM54853 XM54854
REQUIRED OPERATING TIME: NOT SPECIFIED
TER CHECKSHEET NO. 17
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT SUMP LEVEL TRANSMITTERS A, B (LT-RS-251A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-271, -272

EQUIPMENT ITEM NO. 18
LEVEL TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
BARTON MODEL 386
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 18
LICENSEE REFERENCE(S): 3836
FUNCTION (PLANT ID): PRESSURIZER LEVEL INDICATION CONTROL AND PROTECTION (LT-2459 TO -2461)
LICENSEE SUBMITTAL: SCEW(S): 6-182 TO -184

EQUIPMENT ITEM NO. 19
LEVEL TRANSMITTER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B, RC-3B)
ROSEMOUNT MODEL 1153DA4
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 19
LICENSEE REFERENCE(S): 1764
FUNCTION (PLANT ID): STEAM GENERATOR (1, 2, 3) NARROW RANGE LEVEL (LT-2474 TO -2476, -2484 TO 2486, -2494 TO 2496)
LICENSEE SUBMITTAL: SCEW(S): 6-90 TO -98

EQUIPMENT ITEM NO. 20
TERMINAL BLOCK LOCATED IN CONTAINMENT (RC-3A)
GENERAL ELECTRIC, MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 20
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION AND CONTROL
LICENSEE SUBMITTAL: SCEW(S): 6-267

EQUIPMENT ITEM NO. 21
TERMINAL BLOCK LOCATED IN CONTAINMENT (RC-3A)
BUCHANAN, MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 21
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION AND CONTROL
LICENSEE SUBMITTAL: SCEW(S): 6-269

EQUIPMENT ITEM NO. 22
TERMINAL BLOCK LOCATED IN CONTAINMENT (RC-3A)
BURNDY, MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 22
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION AND CONTROL
LICENSEE SUBMITTAL: SCEW(S): 6-270

EQUIPMENT ITEM NO. 23
LIMIT SWITCH LOCATED IN CONTAINMENT (RC-3A)
MANUFACTURER AND MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 23
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION AND CONTROL
LICENSEE SUBMITTAL: SCEW(S): 6-266

EQUIPMENT ITEM NO. 24
TEMPERATURE ELEMENT LOCATED IN CONTAINMENT, INSIDE CRANEWALL
ROSEMOUNT MODEL 176KS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 24
LICENSEE REFERENCE(S): 687
FUNCTION (PLANT ID): REACTOR COOLANT SYSTEM TEMPERATURE ELEMENT COLD LEG LOOPS 1, 2, 3 (TE-2410, -2420, -2430)
LICENSEE SUBMITTAL: SCEW(S): 6-188, -192, -196
FUNCTION (PLANT ID): DELTA T/TAVG PROTECTION SYSTEM LOOPS 1, 2, 3/POST-ACCIDENT MONITORING OF LOOP TEMPERATURE (TE-2412B, D; -2422B, D; -2432B, D)
LICENSEE SUBMITTAL: SCEW(S): 6-189, -190, -193, -194, -197, -198
FUNCTION (PLANT ID): REACTOR COOLANT SYSTEM TEMPERATURE ELEMENT HOT LEG LOOPS 1, 2, 3 (TE-2413, -2423, -2433)
LICENSEE SUBMITTAL: SCEW(S): 6-191, -195, -199

EQUIPMENT ITEM NO. 25
ELECTRIC MOTOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
WESTINGHOUSE MODEL PC090W0L
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 25
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHILLED WATER CHILLER (1-VS-E-4A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-114 TO -116

EQUIPMENT ITEM NO. 26
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING VENTILATION (AB-45)
RCS INC. TYPE BL
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 26
LICENSEE REFERENCE(S): 29
FUNCTION (PLANT ID): DAMPER FOR CHARCOAL FILTRATION SYSTEM (DAMPER 3A, B (2))
LICENSEE SUBMITTAL: SCEW(S): 6-112, -113

EQUIPMENT ITEM NO. 27
HYDROGEN RECOMBINER LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-47B)
WESTINGHOUSE MODEL A
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 27
LICENSEE REFERENCE(S): 1571 TO 1578, 39, 40
FUNCTION (PLANT ID): H2 RECOMBINER (2-GW-HC-2A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-105, -106

EQUIPMENT ITEM NO. 28
HYDROGEN ANALYZER LOCATED IN THE AUXILIARY BUILDING, ELEV. 13'0" (AB-13A)(N)
BENDIX MODEL THERMATRON T3
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 28
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): RADIOACTIVE WASTE GAS (2-GW-H2A-203)
LICENSEE SUBMITTAL: SCEW(S): 6-107

EQUIPMENT ITEM NO. 29
I AND C PANEL LOCATED IN THE AUXILIARY BUILDING CABLE VAULT (AB-13B)
WESTINGHOUSE MODEL A
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 29
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SUPPLY POWER H2 RECOMBINER UNITS
LICENSEE SUBMITTAL: SCEW(S): 6-108, -109

EQUIPMENT ITEM NO. 30
ELECTRICAL THERMOCOUPLE CABLE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
AMPHENOL MODEL TYPE IV
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 30
LICENSEE REFERENCE(S): 5329, 1167, 5288, 4005, 3190, 74
FUNCTION (PLANT ID): SUPPLIES POWER TO SAFETY SYSTEM (NUS-41 SN-65/1065)
LICENSEE SUBMITTAL: SCEW(S): 6-47

EQUIPMENT ITEM NO. 31
FLOW CONTROLLER LOCATED IN THE AUXILIARY BUILDING (AB-2B)
FISCHER AND PORTER MODEL 546
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 31
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING FLOW CONTROL/MINIMUM BORATION (FCV-2122)
LICENSEE SUBMITTAL: SCEW(S): 6-10

EQUIPMENT ITEM NO. 32
ELECTRICAL CABLE LOCATED OUTSIDE CONTAINMENT (AB-27)
KAISER MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 32
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): 5000V POWER CABLE (NUS-217 SN-250)
LICENSEE SUBMITTAL: SCEW(S): 6-60C

EQUIPMENT ITEM NO. 33
ELECTRICAL CABLE LOCATED OUTSIDE CONTAINMENT (AB-27)
OKONITE MODEL EPR/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 33
LICENSEE REFERENCE(S): 2103, 72, 73, 95
FUNCTION (PLANT ID): 5000V POWER CABLE (NUS-364A SN-1443)
LICENSEE SUBMITTAL: SCEW(S): 6-60B

EQUIPMENT ITEM NO. 34
ELECTRICAL CABLE LOCATED OUTSIDE CONTAINMENT
COLLYER INSULATED WIRE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 34
LICENSEE REFERENCE(S): 4019, 91
FUNCTION (PLANT ID): 5000V POWER CABLE (NUS-364 SN-1250)
LICENSEE SUBMITTAL: SCEW(S): 6-60A

EQUIPMENT ITEM NO. 35
ELECTRICAL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL
CONTINENTAL WIRE MODEL SILICON RUBBER
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 35
LICENSEE REFERENCE(S): 1218
FUNCTION (PLANT ID): SUPPLY POWER TO SAFETY SYSTEM (NUS-326 P.O. NO. 330)
LICENSEE SUBMITTAL: SCEW(S): 6-60

EQUIPMENT ITEM NO. 36
ELECTRICAL INSTRUMENT CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
CONTINENTAL WIRE MODEL XLPE/HYPALON
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 36
LICENSEE REFERENCE(S): 1207, 86
FUNCTION (PLANT ID): 600V INSTRUMENT CABLE (NUS-341A SN-1439; NUS-411 SN-1458; NUS-341 SN-285/1285)
LICENSEE SUBMITTAL: SCEW(S): 6-59A, -59, -58

EQUIPMENT ITEM NO. 37
ELECTRICAL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
OKONITE MODEL OKONITE OKOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 37
LICENSEE REFERENCE(S): 2103, 1339
FUNCTION (PLANT ID): 600V POWER CABLE (NAS-3185 NA-3185/4185, 116A NA-128-1128, NUS-374 SN-375, NUS-365D SN-1417, NUS-365C SN-1392, NUS-365B SN-13800)
LICENSEE SUBMITTAL: SCEW(S): 6-57, -56, -50 TO -53

EQUIPMENT ITEM NO. 38
ELECTRICAL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
ANACONDA WIRE AND CABLE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 38
LICENSEE REFERENCE(S): 1347, 77, 79, 76
FUNCTION (PLANT ID): 600V POWER CABLE (NUS-365F SN-462)
LICENSEE SUBMITTAL: SCEW(S): 6-55

EQUIPMENT ITEM NO. 39
ELECTRICAL POWER CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
COLLYER INSULATED WIRE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 39
LICENSEE REFERENCE(S): 4019
FUNCTION (PLANT ID): 600V POWER CABLE (NUS-365E SN-457)
LICENSEE SUBMITTAL: SCEW(S): 6-54

EQUIPMENT ITEM NO. 40
ELECTRICAL CONTROL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
OKONITE MODEL EP/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 40
LICENSEE REFERENCE(S): 1339, 72, 73
FUNCTION (PLANT ID): 1000V CONTROL CABLE (NUS-381B SN-440/1440, NUS-410 SN-1446)
LICENSEE SUBMITTAL: SCEW(S): 6-42B, -41

EQUIPMENT ITEM NO. 41
ELECTRICAL CONTROL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
CONTINENTAL WIRE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 41
LICENSEE REFERENCE(S): 3582
FUNCTION (PLANT ID): 1000V CONTROL CABLE (NUS-420 SN-1463)
LICENSEE SUBMITTAL: SCEW(S): 6-42

EQUIPMENT ITEM NO. 42
ELECTRICAL CONTROL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
GENERAL ELECTRIC MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 42
LICENSEE REFERENCE(S): 3582
FUNCTION (PLANT ID): 1000V CONTROL CABLE (NUS-381 SN-398)
LICENSEE SUBMITTAL: SCEW(S): 6-40

EQUIPMENT ITEM NO. 43
ELECTRICAL INSTRUMENT CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
RAYCHEM MODEL FLAMTROL
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 43
LICENSEE REFERENCE(S): 1831, 1832, 66
FUNCTION (PLANT ID): 300V INSTRUMENT (NAS-3190 3190/4190)
LICENSEE SUBMITTAL: SCEW(S): 6-36

EQUIPMENT ITEM NO. 44
ELECTRICAL INSTRUMENT CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
CERRO WIRE AND CABLE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 44
LICENSEE REFERENCE(S): 1[illegible] 65
FUNCTION (PLANT ID): SUPPLY SIGNAL (NAS-430 NAS-392/1392)
LICENSEE SUBMITTAL: SCEW(S): 6-35

EQUIPMENT ITEM NO. 45
ELECTRICAL INSTRUMENT CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
BOSTON INSULATED WIRE MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 45
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SUPPLY SIGNAL (NAS-128 NA-265/1265)
LICENSEE SUBMITTAL: SCEW(S): 6-34

EQUIPMENT ITEM NO. 46
ELECTRICAL CONTROL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
CERRO WIRE AND CABLE MODEL FIREWALL III
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 46
LICENSEE REFERENCE(S): 3830, 63
FUNCTION (PLANT ID): 600V CONTROL CABLE (NAS-3187 NA-3187/4187; NAS-120 NA-312/1312)
LICENSEE SUBMITTAL: SCEW(S): 6-33, -32

EQUIPMENT ITEM NO. 47
ELECTRIC MOTOR LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-11)
GENERAL ELECTRIC MODEL 5KC37JG770X
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 47
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SERVICE WATER RETURN FROM RECIRCULATION SPRAY HEAT EXCHANGER RADIATION MONITOR (2-SW-P-5A, B, C, D)
LICENSEE SUBMITTAL: SCEW(S): 6-256 TO -259

EQUIPMENT ITEM NO. 48
ELECTRIC MOTOR LOCATED IN SERVICE BUILDING MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
GENERAL ELECTRIC MODEL 5K145DL190KE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 48
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING PUMP COOLING SERVICE WATER PUMP MOTOR (2-SW-P-10A)
LICENSEE SUBMITTAL: SCEW(S): 6-244

EQUIPMENT ITEM NO. 49
ELECTRIC MOTOR LOCATED IN SERVICE BUILDING MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
U.S. ELECTRIC MOTORS MODEL AV9
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 49
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING PUMP COOLING SERVICE WATER PUMP MOTOR (2-SW-P-10B)
LICENSEE SUBMITTAL: SCEW(S): 6-245

EQUIPMENT ITEM NO. 50
ELECTRIC MOTOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
WESTINGHOUSE MODEL ABDP
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 50
LICENSEE REFERENCE(S): 604, 49
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION PUMP MOTOR (2-SI-P-1A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-201, -202

EQUIPMENT ITEM NO. 51
ELECTRIC MOTOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
GENERAL ELECTRIC MODEL 5K6287XH41A
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 51
LICENSEE REFERENCE(S): 47, 46
FUNCTION (PLANT ID): RECIRCULATION SPRAY PUMP MOTOR (2-RS-P-2A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-167, -168

EQUIPMENT ITEM NO. 52
ELECTRIC MOTOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
GENERAL ELECTRIC MODEL 5K6227XH206A
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 52
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTROL AND RELAY ROOM CONDENSER WATER PUMP MOTOR (1-VS-P-1A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-117 TO -119

EQUIPMENT ITEM NO. 53
ELECTRIC MOTOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
ALLIS CHALMERS MODEL 20783FM28
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 53
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHILLED WATER PUMP MOTOR (1-VS-P-2A)
LICENSEE SUBMITTAL: SCEW(S): 6-120

EQUIPMENT ITEM NO. 54
ELECTRIC MOTOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
ALLIS CHALMERS MODEL 20783FM19
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 54
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHILLED WATER PUMP MOTOR (1-VS-P-2B)
LICENSEE SUBMITTAL: SCEW(S): 6-121

EQUIPMENT ITEM NO. 55
ELECTRIC MOTOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
ALLIS CHALMERS MODEL 20783FM
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 55
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHILLED WATER PUMP MOTOR (1-VS-P-2C)
LICENSEE SUBMITTAL: SCEW(S): 6-122

EQUIPMENT ITEM NO. 56
ELECTRIC MOTOR LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-27A)
GENERAL ELECTRIC MODEL 5K6319XJ1D
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 56
LICENSEE REFERENCE(S): 44, 43, 41
FUNCTION (PLANT ID): RECIRCULATION SPRAY PUMP MOTOR (2-RS-P-1A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-123, -124

EQUIPMENT ITEM NO. 57
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING VENTILATION (AB-45)
SIEMENS-ALLIS MODEL 444TS
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 57
LICENSEE REFERENCE(S): 5213
FUNCTION (PLANT ID): AUXILIARY BUILDING VENTILATION (1-VS-F-58A)
LICENSEE SUBMITTAL: SCEW(S): 6-110
FUNCTION (PLANT ID): AUXILIARY BUILDING CONTROL AREA EXHAUST FAN (1-VS-F-58B)
LICENSEE SUBMITTAL: SCEW(S): 6-111

EQUIPMENT ITEM NO. 58
ELECTRIC MOTOR LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-27)
MANUFACTURER AND MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 58
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): AUXILIARY FEEDWATER PUMP MOTOR (2-FW-P-3A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-104A, B

EQUIPMENT ITEM NO. 59
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING
MANUFACTURER AND MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 59
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT VACUUM PUMP MOTOR (2-CV-P-1B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-79, -78

EQUIPMENT ITEM NO. 60
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
GENERAL ELECTRIC MODEL 5K182DL1342A
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 60
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING PUMP COOLING MOTOR (2-CC-P-2B)
LICENSEE SUBMITTAL: SCEW(S): 6-62

EQUIPMENT ITEM NO. 61
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
GENERAL ELECTRIC MODEL 5K182DL126
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 61
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CHARGING PUMP COOLING MOTOR (2-CC-P-2A)
LICENSEE SUBMITTAL: SCEW(S): 6-61

EQUIPMENT ITEM NO. 62
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING CHARGING PUMP CUBICLE (AB-2C)
WESTINGHOUSE MODEL 68F13318
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 62
LICENSEE REFERENCE(S): 604, 33
FUNCTION (PLANT ID): HIGH HEAD SAFETY INJECTION/NORMAL CHARGING (2-CH-P-1C, B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-7 TO 6-9

EQUIPMENT ITEM NO. 63
ELECTRIC MOTOR LOCATED IN THE AUXILIARY BUILDING CABLE VAULT (AB-13B)
CUTLER HAMMER MODEL UNITROL
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 63
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): SUPPLY POWER TO SAFETY SYSTEMS (2-H1-2 SOUTH, NORTH; 2-J1-2 EAST, WEST)
LICENSEE SUBMITTAL: SCEW(S): 6-23 TO -26

EQUIPMENT ITEM NO. 64
MOTORIZED VALVE ACTUATOR LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-11)
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 64
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): RECIRCULATION SPRAY HEAT EXCHANGER SERVICE WATER SUPPLY (MOV-SW-204A, B, C, D; -205A)
LICENSEE SUBMITTAL: SCEW(S): 6-246 TO -250
FUNCTION (PLANT ID): SERVICE WATER OUTLET RECIRCULATION SPRAY HEAT EXCHANGER (MOV-SW-205B)
LICENSEE SUBMITTAL: SCEW(S): 6-251
FUNCTION (PLANT ID): RECIRCULATION SPRAY HEAT EXCHANGER (MOV-SW-205C, D)
LICENSEE SUBMITTAL: SCEW(S): 6-252, -253

EQUIPMENT ITEM NO. 65
MOTORIZED VALVE ACTUATOR LOCATED IN THE SERVICE BUILDING
LIMITORQUE MODEL SMB00
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 65
LICENSEE REFERENCE(S): 29
FUNCTION (PLANT ID): SERVICE WATER (MOV-SW-107B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-254, -255

EQUIPMENT ITEM NO. 66
MOTORIZED VALVE ACTUATOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
LIMITORQUE MODEL SMB WITH CLASS B INSULATION, SIZE 000, 1, 2; WITH MOTOR-BRAKE ASSEMBLY
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 66
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION DISCHARGE VALVE (MOV-2864A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-231, -232
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION STOP VALVE (MOV-2890C, B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-218 TO -220

EQUIPMENT ITEM NO. 67
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
LIMITORQUE MODEL SMB00
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 67
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): BORON INJECTION TANK BYPASS (MOV-2869B)
LICENSEE SUBMITTAL: SCEW(S): 6-323A

EQUIPMENT ITEM NO. 68
MOTORIZED VALVE ACTUATOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
LIMITORQUE, MODEL NOT STATED, PEERLESS MOTOR, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 68
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION PUMP RECIRCULATION (MOV-2885A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-232B, C, D

EQUIPMENT ITEM NO. 69
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING (AB-13A)(S)
LIMITORQUE MODEL SMB00
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 69
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION DISCHARGE (MOV-2863A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-208, -209

EQUIPMENT ITEM NO. 70
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT, INSIDE CRANEWALL, SUBMERGED (RC-3A)
LIMITORQUE MODEL SMB3
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 70
LICENSEE REFERENCE(S): 45
FUNCTION (PLANT ID): ACCUMULATOR ISOLATION (MOV-2865A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-210, -211, -212

EQUIPMENT ITEM NO. 71
MOTORIZED VALVE ACTUATOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
LIMITORQUE MODEL SMC04
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 71
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): RECIRCULATION SPRAY PUMP DISCHARGE (MOV-RS-256A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-171, -172

EQUIPMENT ITEM NO. 72
MOTORIZED VALVE ACTUATOR LOCATED IN MECHANICAL EQUIPMENT ROOM NO. 3 (SB-9B)
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 72
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): CHILLED WATER VALVE CONTROL ROOM HVAC (MOV-PG-107A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-84, -85, -86

EQUIPMENT ITEM NO. 73
ELECTRICAL CABLE, CONTROL LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
CERRO WIRE AND CABLE MODEL PYROTROL III
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 73
LICENSEE REFERENCE(S): 676
FUNCTION (PLANT ID): 1000V CONTROL CABLE (NUS-362 S.N.-1246; NUS-381E S.N.-1447/1246; NUS-381C S.N.-446; NUS-325 SN-246)
LICENSEE SUBMITTAL: SCEW(S): 6-42A, -39, -38, -37

EQUIPMENT ITEM NO. 74
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT SPRAY PUMP HOUSE BELOW EL. 27'6" (CSPH-11)
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 74
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): CHEMICAL ADDITION TANK ISOLATION (MOV-CS-202B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-77, -76

EQUIPMENT ITEM NO. 75
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT SPRAY PUMP HOUSE (CSPH-27)
LIMITORQUE MODEL SMC04
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 75
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): AIR TO BLOWDOWN TRIP VALVE (MOV-CS-201D)
LICENSEE SUBMITTAL: SCEW(S): 6-75
FUNCTION (PLANT ID): SPRAY PUMP DISCHARGE ISOLATION (MOV-CS-201C, B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-74, -73, -72

EQUIPMENT ITEM NO. 76
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING CHARGING PUMP CUBICLE (AB-2C)
LIMITORQUE MODEL SMB, CLASS B INSULATION, SIZES 00, 000; WITH MOTOR-BRAKE ASSEMBLY
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 76
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): CHARGING SUMP SUCTION FROM REFUELING WATER STORAGE TANK (MOV-2115D, B)
LICENSEE SUBMITTAL: SCEW(S): 6-15, -13

EQUIPMENT ITEM NO. 77
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
LIMITORQUE, MODEL NOT STATED, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 77
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): REACTOR COOLING PUMP SEAL WATER RETURN (MOV-2381)
LICENSEE SUBMITTAL: SCEW(S): 6-6

EQUIPMENT ITEM NO. 78
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL
ASCO MODEL NP8320179E
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 78
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): OUTSIDE BLOWDOWN TRIP VALVE (SOV-BD-200A)
LICENSEE SUBMITTAL: SCEW(S): 6-260
FUNCTION (PLANT ID): AIR TO BLOWDOWN TRIP VALVE (SOV-BD-200C)
LICENSEE SUBMITTAL: SCEW(S): 6-262

EQUIPMENT ITEM NO. 79
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO, MODEL NOT STATED
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 79
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): AIR TO BLOWDOWN TRIP VALVE (SOV-BD-200B)
LICENSEE SUBMITTAL: SCEW(S): 6-261

EQUIPMENT ITEM NO. 80
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 8320A102
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 80
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): AIR TO BLOWDOWN TRIP VALVE (SOV-BD-200D, F)
LICENSEE SUBMITTAL: SCEW(S): 6-263, -265
FUNCTION (PLANT ID): CONTAINMENT INSTRUMENT AIR COMPRESSOR SUCTION (SOV-IA-201B)
LICENSEE SUBMITTAL: SCEW(S): 6-127

EQUIPMENT ITEM NO. 81
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL
ASCO MODEL NP8320A179V
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 81
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT INSTRUMENT AIR COMPRESSOR SUCTION (SOV-BD-200E)
LICENSEE SUBMITTAL: SCEW(S): 6-264

EQUIPMENT ITEM NO. 82
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ASCO MODEL 2068323RF
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 82
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER LIQUID SPACE SAMPLE (SOV-SS-200A1, 201A1)
LICENSEE SUBMITTAL: SCEW(S): 6-233, -235
FUNCTION (PLANT ID): PRESSURIZER RELIEF TANK SAMPLE (SOV-SS-204A)
LICENSEE SUBMITTAL: SCEW(S): 6-240
FUNCTION (PLANT ID): PRIMARY COOLANT HOT LEG SAMPLE (SOV-SS-206A)
LICENSEE SUBMITTAL: SCEW(S): 6-242

EQUIPMENT ITEM NO. 83
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 830281RF
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 83
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER LIQUID SPACE SAMPLE (SOV-SS-200B1)
LICENSEE SUBMITTAL: SCEW(S): 6-234
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG SAMPLE (SOV-SS-202B1)
LICENSEE SUBMITTAL: SCEW(S): 6-238
FUNCTION (PLANT ID): RESIDUAL HEAT REMOVAL SAMPLE (SOV-SS-203)
LICENSEE SUBMITTAL: SCEW(S): 6-239
FUNCTION (PLANT ID): PRESSURE RELIEF TANK SAMPLE (SOV-SS-204B)
LICENSEE SUBMITTAL: SCEW(S): 6-241
FUNCTION (PLANT ID): PRIMARY COOLANT HOT LEG SAMPLE (SOV-SS-206B)
LICENSEE SUBMITTAL: SCEW(S): 6-243

EQUIPMENT ITEM NO. 84
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 2068323RF
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 84
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER VAPOR SPACE (SOV-SS-201B1)
LICENSEE SUBMITTAL: SCEW(S): 6-236
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG SAMPLE (SOV-SS-202A1)
LICENSEE SUBMITTAL: SCEW(S): 6-237

EQUIPMENT ITEM NO. 85
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 8320A102
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 85
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): NITROGEN SUPPLY (SOV-SI-200)
LICENSEE SUBMITTAL: SCEW(S): 6-221
FUNCTION (PLANT ID): NITROGEN RELIEF (SOV-SI-201B)
LICENSEE SUBMITTAL: SCEW(S): 6-223
FUNCTION (PLANT ID): REACTOR CONTAINMENT SUMP PUMP DISCHARGE (SOV-DA-200B)
LICENSEE SUBMITTAL: SCEW(S): 6-174
FUNCTION (PLANT ID): RADIATION MONITORING TRIP VALVE (SOV-RM-200B)
LICENSEE SUBMITTAL: SCEW(S): 6-179
FUNCTION (PLANT ID): COOLING WATER RETURN FROM RESIDUAL HEAT EXCHANGER ISOLATION (SOV-CC-209A)
LICENSEE SUBMITTAL: SCEW(S): 6-67

EQUIPMENT ITEM NO. 86
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ASCO, MODEL NOT STATED
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 86
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): NITROGEN RELIEF (SOV-SI-201A)
LICENSEE SUBMITTAL: SCEW(S): 6-222
FUNCTION (PLANT ID): REACTOR CONTAINMENT PUMP DISCHARGE (SOV-DA-200A)
LICENSEE SUBMITTAL: SCEW(S): 6-173
FUNCTION (PLANT ID): PRIMARY DRAIN TRANSFER TANK VENT (SOV-VG-209A)
LICENSEE SUBMITTAL: SCEW(S): 6-177
FUNCTION (PLANT ID): RADIATION MONITORING TRIP VALVE (SOV-RM-200C)
LICENSEE SUBMITTAL: SCEW(S): 6-180

EQUIPMENT ITEM NO. 87
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING CHARGING PUMP CUBICLE (AB-2C)
ASCO MODEL 8302C4U
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 87
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG (SOV-SI-202A1, B1)
LICENSEE SUBMITTAL: SCEW(S): 6-224, -226
FUNCTION (PLANT ID): REFUELING WATER STORAGE TANK CROSS CONNECT (SOV-SI-202A2, B2)
LICENSEE SUBMITTAL: SCEW(S): 6-225, -227

EQUIPMENT ITEM NO. 88
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL LB831654
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 88
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): BORON INJECTION TANK RECIRCULATION (SOV-2884A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-228 TO -230

EQUIPMENT ITEM NO. 89
SOLENOID VALVE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-47A)
ASCO, MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 89
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER POWER OPERATED RELIEF (SOV-2455C-1, -2; -2456-1, -2)
LICENSEE SUBMITTAL: SCEW(S): 6-200C, D, F, G

EQUIPMENT ITEM NO. 90
SOLENOID VALVE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-47A)
LAWRENCE MODEL 3300WA742DC
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 90
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER POWER OPERATED RELIEF (SOV-24455C-3, -2456-3)
LICENSEE SUBMITTAL: SCEW(S): 6-200E, H

EQUIPMENT ITEM NO. 91
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ASCO MODEL HBX8320A12
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 91
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): NITROGEN SUPPLY LINE (SOV-DG-208A)
LICENSEE SUBMITTAL: SCEW(S): 6-175
FUNCTION (PLANT ID): CONTAINMENT VACUUM PUMP TRIP VALVE (SOV-CV-250A)
LICENSEE SUBMITTAL: SCEW(S): 6-80

EQUIPMENT ITEM NO. 92
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL HBX8320A12
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 92
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY DRAIN TRANSFER PUMP (SOV-DG-208B)
LICENSEE SUBMITTAL: SCEW(S): 6-176
FUNCTION (PLANT ID): RADIATION MONITORING TRIP VALVE (SOV-RM-200A)
LICENSEE SUBMITTAL: SCEW(S): 6-181
FUNCTION (PLANT ID): CONTAINMENT VACUUM PUMP TRIP VALVE (SOV-CV-250C, D, B)
LICENSEE SUBMITTAL: SCEW(S): 6-81 TO -83
FUNCTION (PLANT ID): COMPONENT COOLING FROM CONTAINMENT COOLER (SOV-CC-210C, B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-69 TO -71
FUNCTION (PLANT ID): REACTOR COOLANT PUMP THERMAL BARRIER ISOLATION (SOV-CC-207)
LICENSEE SUBMITTAL: SCEW(S): 6-66
FUNCTION (PLANT ID): REACTOR COOLANT PUMP COOLING WATER ISOLATION (SOV-CC-205C, B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-63 TO -65

EQUIPMENT ITEM NO. 93
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL HT8316C47E
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 93
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MAIN STEAM TRIP VALVE (SOV-MS-201AA, AB, BA, BB)
LICENSEE SUBMITTAL: SCEW(S): 6-160 TO -163

EQUIPMENT ITEM NO. 94
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL NP8316A76E
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 94
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MAIN STEAM TRIP VALVE (SOV-MS-201CA)
LICENSEE SUBMITTAL: SCEW(S): 6-164

EQUIPMENT ITEM NO. 95
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL HT8316CE7E
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 95
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MAIN STEAM TRIP VALVE (SOV-MS-201CB)
LICENSEE SUBMITTAL: SCEW(S): 6-165

EQUIPMENT ITEM NO. 96
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL NP8320A174E
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 96
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY GRADE WATER TO PRESSURIZER RELIEF TANK (SOV-2519A)
LICENSEE SUBMITTAL: SCEW(S): 6-200

EQUIPMENT ITEM NO. 97
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 80174
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 97
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY DRAIN TRANSFER TANK VENT (SOV-VG-209B)
LICENSEE SUBMITTAL: SCEW(S): 6-178

EQUIPMENT ITEM NO. 98
SOLENOID VALVE LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-27)
ASCO MODEL 80147
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 98
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): MAIN STEAM LINE DRAINS TO CONDENSER (SOV-MS-209, -210)
LICENSEE SUBMITTAL: SCEW(S): 6-166, -166A

EQUIPMENT ITEM NO. 99
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING (AB-13)(N)
ASCO MODEL 8320A102
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 99
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT LEAKAGE MONITORING (SOV-LM-200A TO H; 201A, B)
LICENSEE SUBMITTAL: SCEW(S): 6-132 TO -138, -140, -141

EQUIPMENT ITEM NO. 100
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL HBX8320A26
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 100
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT INSTRUMENT AIR COMPRESSOR DISCHARGE (SOV-IA-200)
LICENSEE SUBMITTAL: SCEW(S): 6-125

EQUIPMENT ITEM NO. 101
SOLENOID VALVE LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-3B)
ASCO MODEL NP8320A179E
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 101
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): CONTAINMENT INSTRUMENT AIR COMPRESSOR SUCTION (SOV-IA-201A)
LICENSEE SUBMITTAL: SCEW(S): 6-126

EQUIPMENT ITEM NO. 102
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL NP8320A173V
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 102
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): COOLING WATER RETURN FROM RESIDUAL HEAT EXCHANGER ISOLATION (SOV-CC-209B)
LICENSEE SUBMITTAL: SCEW(S): 6-68

EQUIPMENT ITEM NO. 103
SOLENOID VALVE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
ASCO MODEL NP831654V
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 103
LICENSEE REFERENCE(S): 2850
FUNCTION (PLANT ID): CHEMICAL VOLUME CONTROL SYSTEM ISOLATION VALVE FOR LETDOWN (SOV-2200A, B, C)
LICENSEE SUBMITTAL: SCEW(S): 6-20 TO -22

EQUIPMENT ITEM NO. 104
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
ASCO MODEL 831654
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 104
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): LETDOWN INLET NON-REGENERATIVE HEAT EXCHANGER (SOV-2204)
LICENSEE SUBMITTAL: SCEW(S): 6-19

EQUIPMENT ITEM NO. 105
SOLENOID VALVE LOCATED IN CONTAINMENT, INSIDE CRANEWALL
ASCO MODEL LB831654
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 105
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER AUXILIARY SPRAY ISOLATION (SOV-2311)
LICENSEE SUBMITTAL: SCEW(S): 6-12

EQUIPMENT ITEM NO. 106
SOLENOID VALVE LOCATED IN THE MAIN STEAM VALVE HOUSE (MSVH-27)
ASCO MODEL HBX8320A26
REQUIRED OPERATING TIME: 60 SECONDS
TER CHECKSHEET NO. 106
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): AIR REMOVAL TO CONTAINMENT (SOV-SV-202A)
LICENSEE SUBMITTAL: SCEW(S): 6-1

EQUIPMENT ITEM NO. 107
ELECTRICAL CABLE LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-3A)
KAISER MODEL XLPE/NEOPRENE
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 107
LICENSEE REFERENCE(S): 3582
FUNCTION (PLANT ID): 600V POWER CABLE (NUS-225 SN-251)
LICENSEE SUBMITTAL: SCEW(S): 6-48

EQUIPMENT ITEM NO. 108
ELECTRICAL CABLE SPLICE LOCATED IN CONTAINMENT (RC-3A)
MANUFACTURER AND MODEL NOT STATED
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 108
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION AND CONTROL
LICENSEE SUBMITTAL: SCEW(S): 6-268

EQUIPMENT ITEM NO. 109
MOTORIZED VALVE ACTUATOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
LIMITORQUE MODEL H2BC, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 109
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION SUCTION (MOV-2862B)
LICENSEE SUBMITTAL: SCEW(S): 6-207

EQUIPMENT ITEM NO. 110
MOTORIZED VALVE ACTUATOR LOCATED IN THE SAFEGUARD AREA (SFGD-1)
LIMITORQUE MODEL SMB, CLASS B INSULATION, SIZES 00, 000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 110
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): RECIRCULATION SPRAY PUMP SUCTION (MOV-RS-255B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-170, -169
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION RECIRCULATION WATER (MOV-2860B, A)
LICENSEE SUBMITTAL: SCEW(S): 6-205, -204
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION SUCTION FROM REACTOR WATER STORAGE TANK (MOV-2862A)
LICENSEE SUBMITTAL: SCEW(S): 6-206
FUNCTION (PLANT ID): LOW HEAD SAFETY INJECTION PUMP RECIRCULATION (MOV-2885D)
LICENSEE SUBMITTAL: SCEW(S): 6-232E

EQUIPMENT ITEM NO. 111
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING PENETRATION AREA (AB-2B)
LIMITORQUE MODEL SMB 00, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 111
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): BORIC ACID INJECTION TANK OUTLET VALVE (MOV-2842, -2867B, C, D)
LICENSEE SUBMITTAL: SCEW(S): 6-203, -214 TO -216
FUNCTION (PLANT ID): BORIC ACID INJECTION TANK VALVE (MOV-2867A)
LICENSEE SUBMITTAL: SCEW(S): 6-213

EQUIPMENT ITEM NO. 111 (CONTINUED)
FUNCTION (PLANT ID): SAFETY INJECTION TO REACTOR HOT LEGS ISOLATION (MOV-2869A)
LICENSEE SUBMITTAL: SCEW(S): 6-217
FUNCTION (PLANT ID): CHARGING HEADER ISOLATION VALVE (MOV-2289B)
LICENSEE SUBMITTAL: SCEW(S): 6-18
FUNCTION (PLANT ID): CHARGING TO REGENERATIVE HEAT EXCHANGER STOP VALVE (MOV-2289A)
LICENSEE SUBMITTAL: SCEW(S): 6-17
FUNCTION (PLANT ID): CHARGING PUMP 2-CH-P-1B RECIRCULATION/REFUELING WATER STORAGE TANK HEADER ISOLATION (MOV-2373)
LICENSEE SUBMITTAL: SCEW(S): 6-5

EQUIPMENT ITEM NO. 112
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT, INSIDE CRANEWALL (RC-47A)
LIMITORQUE MODEL SMB000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 112
LICENSEE REFERENCE(S): 659, 706, 45
FUNCTION (PLANT ID): PRESSURIZER RELIEF BLOCK VALVE (MOV-2535, -2536)
LICENSEE SUBMITTAL: SCEW(S): 6-200A, B

EQUIPMENT ITEM NO. 113
MOTORIZED VALVE ACTUATOR LOCATED IN CONTAINMENT, OUTSIDE CRANEWALL (RC-47B)
LIMITORQUE MODEL SMB00, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 113
LICENSEE REFERENCE(S): 659, 706, 45
FUNCTION (PLANT ID): AUXILIARY FEEDWATER/HELB MITIGATION (MOV-FW-251A TO F)
LICENSEE SUBMITTAL: SCEW(S): 6-99 TO -104

EQUIPMENT ITEM NO. 114
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING CHARGING PUMP CUBICLE (AB-2C)
LIMITORQUE, MODEL NOT STATED, PEERLESS MOTOR, CLASS B INSULATION
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 114
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): CHARGING PUMP 2-CH-P-1A RECIRCULATION TO REFUELING WATER STORAGE TANK (MOV-2275A)
LICENSEE SUBMITTAL: SCEW(S): 6-2

EQUIPMENT ITEM NO. 115
MOTORIZED VALVE ACTUATOR LOCATED IN THE AUXILIARY BUILDING CHARGING PUMP CUBICLE (AB-2C)
LIMITORQUE MODEL SMB WITH CLASS B INSULATION; SIZES 00, 000
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 115
LICENSEE REFERENCE(S): 662, 659, 29
FUNCTION (PLANT ID): CHARGING PUMP 2-CH-P-1C RECIRCULATION TO REFUELING WATER STORAGE TANK (MOV-2275C, B)
LICENSEE SUBMITTAL: SCEW(S): 6-4, 6-3
FUNCTION (PLANT ID): CHARGING PUMP SUCTION FROM VOLUME CONTROL TANK (MOV-2115E, C)
LICENSEE SUBMITTAL: SCEW(S): 6-16, -14

EQUIPMENT ITEM NO. 116
PRESSURE TRANSMITTER LOCATED IN THE AUXILIARY BUILDING
ROSEMOUNT MODEL 1152AP7A22PB
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 104
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT PRESSURE POST-ACCIDENT MONITORING (PT-LM-201A, -201B)
LICENSEE SUBMITTAL: SCEW(S): T-1, T-2 [4]

EQUIPMENT ITEM NO. 117
SOLENOID VALVE LOCATED IN THE SAFEGUARDS AREA
ASCO MODEL NP8316S4E
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 105
LICENSEE REFERENCE(S): 649
FUNCTION (PLANT ID): CONTAINMENT ISOLATION (SOV-DA-203A, B)
LICENSEE SUBMITTAL: SCEW(S): T-3, T-4 [4]

EQIUPMENT ITEM NO. 118
LEVEL TRANSMITTER LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
GEMS MODELS XM-54854 AND XM-54853
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 106
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): REACTOR COOLANT WATER LEVEL (WIDE RANGE) (LT-RS-251A, B)
LICENSEE SUBMITTAL: SCEW(S): T-30, T-31 [4]

EQUIPMENT ITEM NO. 119
LEVEL TRANSMITTER LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
GEMS MODEL XM-54854
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 107
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): REACTOR COOLANT SUMP WATER LEVEL, NARROW RANGE (LT-DA-210A, B)
LICENSEE SUBMITTAL: SCEW(S): T-5, T-6 [4]

EQUIPMENT ITEM NO. 120
LIMIT SWITCH LOCATED IN THE SAFEGUARDS AREA
NAMCO MODEL EA180-31302
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 108
LICENSEE REFERENCE(S): 4447
FUNCTION (PLANT ID): CONTAINMENT ISOLATION AUXILIARY BUILDING SUMP (ZS-DA-203A, B)
LICENSEE SUBMITTAL: SCEW(S): T-7, T-8 [4]

EQUIPMENT ITEM NO. 121
ACCELEROMETER LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
ENDEVCO MODEL 2273AM20
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 109
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER SAFETY AND PORV VALVE POSITION INDICATOR (YE-200A-1, -2; -200B-1, -2; -200C-1, -2; -201A-1, -2; 201B-1, -2)
LICENSEE SUBMITTAL: SCEW(S): T-9 THROUGH T-18 [4]

EQUIPMENT ITEM NO. 122
HARDLINE COAXIAL CABLE LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
ENDEVCO MODEL 3075M6
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 110
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): VALVE POSITION INDICATION SIGNAL TRANSMISSION (LOW NOISE CABLE)
LICENSEE SUBMITTAL: SCEW(S): T-19 [4]

EQUIPMENT ITEM NO. 123
CHARGE PREAMPLIFIER LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
UNHOLTZ-DICKIE MODEL 22CA-2TR
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 111
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRESSURIZER PORV AND SAFETY VALVE POSITION INDICATION (YY-VMS-200A-1, -2; B-1, -2; C-1, -2; -201A-1, -2; B-1, -2)
LICENSEE SUBMITTAL: SCEW(S): T-20 THROUGH T-29 [4]

EQUIPMENT ITEM NO. 124
SOLENOID VALVE LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
VALCOR MODEL V526
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 112
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): POST-ACCIDENT SAMPLING (HCV-SS-200A, -200B)
LICENSEE SUBMITTAL: SCEW(S): 10.3-38, -39 [15]

EQUIPMENT ITEM NO. 125
SOLENOID VALVE LOCATED INSIDE CONTAINMENT, OUTSIDE CRANEWALL
VALCOR MODEL V526
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 113
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG SAMPLING VALVE (TV-SS-202A, -206A, -203A; HCV-SS-201D, -202A)
LICENSEE SUBMITTAL: SCEW(S): 10.3-32, -34, -40, -36, -37 [15]

EQUIPMENT ITEM NO. 126
SOLENOID VALVE LOCATED IN THE AUXILIARY BUILDING
VALCOR MODEL V526
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 114
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): HYDROGEN ANALYZER CONTAINMENT ISOLATION (TV-GW-200 THROUGH -207; TV-SS-202B, -203B, -206B; S1-XCV-2401A, B; -2422A, B)
LICENSEE SUBMITTAL: SCEW(S): 10.3-76 THROUGH -83; 10.3-33, -35, -41, -62, -63, -64, -65 [15]

EQUIPMENT ITEM NO. 127
LIMIT SWITCH LOCATED INSIDE CONTAINMENT, INSIDE CRANEWALL
GORDOS MODEL MR8901
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 115
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): RHR SYSTEM OUTLET POST-ACCIDENT SAMPLING VALVE (ZS-SS-200A-1, -2; -200B-1, -2)
LICENSEE SUBMITTAL: SCEW(S): 10.3-54, -55, -56, -57 [15]

EQUIPMENT ITEM NO. 128
LIMIT SWITCH LOCATED INSIDE CONTAINMENT, OUTSIDE CRANEWALL
GORDOS MODEL MR8901
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 116
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG SAMPLING VALVE (ZS-SS-202A-1, -2; -206A-1, -2; -201D-1, -2; 202A-3, -4; 203A-1, -2)
LICENSEE SBUMITTAL: SCEW(S): 10.3-42, -43, -46, -47, -50, -51, -52, -53, -58, -59 [15]

EQUIPMENT ITEM NO. 129
LIMIT SWITCH LOCATED IN THE AUXILIARY BUILDING
GORDOS MODEL MR8901
REQUIRED OPERATING TIME: 120 DAYS
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): PRIMARY COOLANT COLD LEG SAMPLING VALVE (ZS-SS-202B-2, -1; -206B-1, -2; 203B-1, -2; ZS-XCV-2401A-1, -2; -2401B-1, -2; 2422A-1, -2; -2422B-1, -2; ZS-GW-200-1, -2; -201-1, -2; -202-1, -2; -203-1, -2; -204-1, -2; -205-1, -2; -206-1, -2; -207-1, -2)
LICENSEE SUBMITTAL: SCEW(S): 10.3-45, -44, -48, -49, -60, -61, -66 THROUGH -69, -70 THROUGH -73, -84 THROUGH -99 [15]

EQUIPMENT ITEM NO. 130
HYDROGEN ANALYZER LOCATED IN THE AUXILIARY BUILDING
COMSIP-DELPHI MODEL K-III
REQUIRED OPERATING TIME: 120 DAYS
LICENSEE REFERENCE(S): NOT CITED
FUNCTION (PLANT ID): CONTAINMENT HYDROGEN ANALYZER (H2A-GW-201-1, -2)
LICENSEE SUBMITTAL: SCEW(S): 10.3-74, -75 [15]

EQUIPMENT ITEM NO. 131
FLOW TRANSMITTER LOCATED INSIDE CONTAINMENT, OUTSIDE CRANEWALL (RC-18B)
FISCHER AND PORTER MODEL 10B2496QB
REQUIRED OPERATING TIME: 120 DAYS
TER CHECKSHEET NO. 131
LICENSEE REFERENCE(S): 687
FUNCTION (PLANT ID): STEAM-FLOW TRANSMITTER (FT-2474, -2475, -2484, -2485, -2494, -2495)
LICENSEE SUBMITTAL: SCEW(S): 6-142 TO -147

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	System[1]
Emergency Reactor Shutdown	Reactor Coolant Reactor Protection Safeguards Actuation Chemical and Volume Control
Containment Isolation	Containment Isolation
Reactor Core Cooling	High Pressure Injection Low Pressure Injection Accumulators
Containment Heat Removal	Containment Spray Containment Ventilation Containment Sump Recirculation
Core Residual Heat	Residual Heat Removal Pressurizer Spray Power Operated Relief Valves Main Feedwater Auxiliary Feedwater Main Steam Steam Dump Component Cooling Water Service Water
Prevention of Significant Release of Radioactive Material to Environment	Containment Spray (Iodine Removal) Containment Air Purification Containment Gas Control Containment Radiation Monitoring Containment Radiation Sampling
Supporting Systems	Emergency Power Control Room and Safety Equipment Area Ventilation

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 function of the system(s) with the responsible IE regional reviewer and/or the licensee.

C.2 SAFETY-RELATED INSTRUMENTATION

In Section 3.1 of the NRC SER [17], the NRC made the following statement:

"Display instrumentation which provides information for the reactor operators to aid them in the safe handling of the plant was not specifically identified by the licensee. A complete list of all display instrumentation mentioned in the LOCA and HELB emergency procedures must be provided. Equipment qualification information in the form of summary sheets should be provided for all components of the display instrumentation exposed to harsh environments. Instrumentation which is not considered to be safety related but which is mentioned in the emergency procedure should appear on the list. For these instruments, (1) justification should be provided for not considering the instrument safety related and (2) assurance should be provided that its subsequent failure will not mislead the operator or adversely affect the mitigation of the consequences of the accident. The environmental qualification of post-accident sampling and monitoring and radiation monitoring equipment is closely related to the review of the TMI Lessons-Learned modifications and will be performed in conjunction with that review."

In Reference 18, the Licensee provided the following response:

"A list of display instrumentation referenced in the Emergency Procedures is provided in Table 1 [Table C-1 of this TER]. The equipment in Table 1 has been divided into three categories.

Category A - Display instrumentation which has been previously included on the master list of the I.E. Bulletin 79-01B 90 Day Review, Revision 3. The appropriate worksheet page number for each item in this category can be found in Table 1.

Category B - Display instrumentation which is in a harsh environment but not previously listed on the master list of I.E. Bulletin 79-01B 90 Day Review, Revision 3. Equipment in this category has been added to the master list of I.E. Bulletin 79-01B 90 Day Review, Revision 4, as a result of our review of the Emergency Procedures. The appropriate worksheet page number for the equipment in this category can be found in Table 1.

The qualification status and proposed corrective action of equipment in Category B is as follows:

LT-RS251A, B — Containment Sump Level

This equipment is being replaced as part of the TMI Lessons-Learned modifications. The transmitters were included on the master list for the

TMI Review Supplement 3 response submitted February 1, 1981.

PT-2402	RCS Wide Range Pressure
PT-RC2401-1	RCS Wide Range Pressure
LT-2477, 87, 97	Steam Generator Wide Range Pressure
PT-RS256A, B	Outside Recirculation Spray Pump Discharge Pressure
FT-2961, 62, 63	Cold Leg. SI Flow
FT-2945, 46	Low Head Injection Header Flow

The sensor, cable and terminations of the indication listed above will be reviewed for qualification. Those portions of the instrumentation loop that are exposed to a harsh environment will be upgraded with qualified equipment. This will ensure that the operator will not be provided with erroneous indication due to the effects of a harsh environment on this equipment in the event of a LOCA or MSLB.

The majority of the display instrumentation in the Surry control room is supplied directly from protection channels. However, to ensure the integrity of the trip function, an isolation device is provided to supply the indicator so that faults at the indicator will not be reflected into the safety trip portion of the circuit. Therefore, the cables that run from the safety trip circuit to the indicator are not treated as Class 1E cables with respect to cable separation. This approach allows for redundant indicators to be positioned side-by-side for comparison of readings.

Qualification of Post Accident Monitoring equipment referenced in the Emergency Procedures is a new requirement. Vepco will review the qualification status of this equipment and advise the NRC of the schedule for implementation of any required corrective action by June 30, 1982.

Category C - Display instrumentation which is not exposed to a harsh environment. These components will be included on the master list for equipment which is in a mild environment and will be reviewed as such. At present there is no requirement to provide Component Evaluation sheets for equipment in a mild environment."

Evaluation

In view of the Licensee's response, this item is considered resolved.

Table C-1. Display Instrumentation Referenced in the Emergency Procedures [18]

Surry 1 and 2
August 24, 1981

TABLE 1

CATEGORY A

MARK NUMBER	DESCRIPTION	EXPOSED TO A HARSH ENVIRONMENT	PREVIOUSLY LISTED ON MASTER LIST	WORKSHEET	COMMENT
TE-2413	RCS Temperature Element (Wide Range)	X	X	191	--
TE-2423	RCS Temperature Element (Wide Range)	X	X	195	--
TE-2433	RCS Temperature Element (Wide Range)	X	X	199	--
PT-LM200A	Containment Pressure (Narrow Range)	X	X	128	--
PT-LM200B	Containment Pressure (Narrow Range)	X	X	129	--
PT-LM200C	Containment Pressure (Narrow Range)	X	X	130	--
PT-LM200D	Containment Pressure (Narrow Range)	X	X	131	--
LT-2459	Pressurizer Level Protection	X	X	182	--
LT-2460	Pressurizer Level Protection	X	X	183	--
LT-2461	Pressurizer Level Protection	X	X	184	--
LT-2474	Steam Generator Narrow Range Protection	X	X	90	--
LT-2484	Steam Generator Narrow Range Protection	X	X	93	--

NOTE: Surry Unit Two mark numbers are provided. Table 1 also applies to Surry Unit 1 equipment.

TER-C5257-483

FIGURE SUPPLIED BY THE LICENSEE

TABLE 1

CATEGORY A - (Continued)

MARK NUMBER	DESCRIPTION	EXPOSED TO A HARSH ENVIRONMENT	PREVIOUSLY LISTED ON MASTER LIST	WORKSHEET	COMMENT
LT-2494	Steam Generator Narrow Range Protection	X	X	96	--
LT-2475	Steam Generator Narrow Range Protection	X	X	91	--
LT-2485	Steam Generator Narrow Range Protection	X	X	94	--
LT-2495	Steam Generator Narrow Range Protection	X	X	97	--
LT-2476	Steam Generator Narrow Range Protection	X	X	92	--
LT-2486	Steam Generator Narrow Range Protection	X	X	95	--
LT-2496	Steam Generator Narrow Range Protection	X	X	98	--
PT-2474	Steam Generator 1 Pressure	X	X	151	--
PT-2475	Steam Generator 1 Pressure	X	X	152	--
PT-2476	Steam Generator 1 Pressure	X	X	153	--
PT-2484	Steam Generator 2 Pressure	X	X	154	--
PT-2485	Steam Generator 2 Pressure	X	X	155	--

FIGURE SUPPLIED BY THE LICENSEE

Surry 1 and 2
August 24, 1981

TABLE 1

CATEGORY A - (Continued)

MARK NUMBER	DESCRIPTION	EXPOSED TO A HARSH ENVIRONMENT	PREVIOUSLY LISTED ON MASTER LIST	WORKSHEET	COMMENT
PT-2486	Steam Generator 2 Pressure	X	X	156	--
PT-2494	Steam Generator 3 Pressure	X	X	157	--
PT-2495	Steam Generator 3 Pressure	X	X	158	--
PT-2496	Steam Generator 3 Pressure	X	X	159	--
FT-FW200A	Aux Steam Generator Feed Pump Flow	X	X	87	--
FT-FW200B	Aux Steam Generator Feed Pump Flow	X	X	88	--
FT-FW200C	Aux Steam Generator Feed Pump Flow	X	X	89	--

FIGURE SUPPLIED BY THE LICENSEE.

Franklin Research Center
A Division of The Franklin Institute

TER-C5257-483

TABLE 1

CATEGORY B

MARK NUMBER	DESCRIPTION	EXPOSED TO A HARSH ENVIRONMENT	PREVIOUSLY LISTED ON MASTER LIST	WORKSHEET	COMMENT
LT-RS251A	Containment Sump Level	X		10.3-30	TMI Reveiw Supplement 3
LT-RS251B	Containment Sump Level	X		10.3-31	TMI Reveiw Supplement 3
PT-2402	RCS Wide Range Pressure	X		6-273	--
PT-RC2402-1	RCS Wide Range Pressure	X		6-274	--
LT-2477	Steam Generator Wide Range Level	X		6-275	--
LT-2487	Steam Generator Wide Range Level	X		6-276	--
LT-2497	Steam Generator Wide Range Level	X		6-277	--
PT-RS256A	Outside Recirculation Spray Pump Discharge Pressure	X		6-278	--
PT-RS256B	Outside Recirculation Spray Pump Discharge Pressure	X		6-279	--
FT-2961	Clod Leg Safety Injection Flow	X		6-280	--
FT-2962	Clod Leg Safety Injection Flow	X		6-281	--
FT-2963	Clod Leg Safety Injection Flow	X		6-282	--
FT-2945	Low Head Injection Header Flow	X		6-283	--
FT-2946	Low Head Injection Header Flow	X		6-284	--

FIGURE SUPPLIED BY THE LICENSEE

Surry 1 and 2
August 24, 1981

TABLE 1

CATEGORY C

MARK NUMBER	DESCRIPTION	EXPOSED TO A HARSH ENVIRONMENT	PREVIOUSLY LISTED ON MASTER LIST	WORKSHEET	COMMENT
LT-CS200A	Refueling Water Storage Tank Level			NA	--
LT-CS200B	Refueling Water Storage Tank Level			NA	--
LT-CN200	Consensate Storage Tank Level			NA	--
LT-CS200C	Consensate Storage Tank Level			NA	--
LT-CS200D	Consensate Storage Tank Level			NA	--

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 [17]:

> "Subsection 4.2 identified deficiencies that must be resolved to establish the qualification of the equipment; the staff requires that the information lacking in this category be provided within 90 days of receipt of this SER. Within this period, the licensee should either provide documentation of the missing qualification information which demonstrates that such equipment meets the DOR guidelines or NUREG-0588 or commit to a corrective action (requalification, replacement, relocation, and so forth) consistent with the requirements to establish qualification by June 30, 1982. If the latter option is chosen, the licensee must provide justification for operation until such corrective action is complete."

On January 19, 1982, FRC representatives met with NRC Division of Licensing personnel at NRC offices to discuss the potential for FRC to assist the staff in the technical review of licensees' statements regarding justification for interim plant operation submitted in response to outstanding qualification deficiencies in the NRC EEQ SERs. The results of the meeting were as follows: (1) FRC was requested to proceed immediately with the technical review of licensees' justification for interim operation, (2) the format was established, and (3) the criteria for the review were established. These criteria are presented in Section 2 of this appendix.

On January 21, 1982, the NRC provided the following modification to Final Assignment 13 concerning this subject:

> "The FRC review will consist of:
>
> - Review the licensee's justification of interim operation and provide FRC independent analysis which shows whether or not licensee provided technically sound rationale as a basis for justification for continued plant operation.

- On January 27, 1982, FRC shall provide a list of those power reactors that have provided technically sound justification for continued operation. FRC shall also provide a list of those power reactors which have not provided technically sound justification for continued operation. In addition to the lists, FRC may provide any additional information which in FRC's judgment is necessary to support the conclusions regarding justification for continued operation."

On January 25, 1982, the NRC was provided with the completed review of the licensees' statements presented as a basis for justification for interim operation in response to the NRC EEQ SER.* On February 5, 1982, at the NRC's request, the NRC was provided with actual examples of licensees' responses to the NRC EEQ SER that provide adequate rationale as a basis for justification for interim operation.**

2. GENERAL DISCUSSION

In general, licensee-submitted justifications for interim operation are based on systems considerations, equipment operability evaluations, or failure-modes-and-effects analyses.

Systems considerations often involve the availability of backup equipment capable of performing the particular safety function of concern. The backup equipment is either environmentally qualified, unqualified but not exposed to a harsh environment at the same time as the primary equipment, or located so that it is unlikely that both the primary and backup equipment would be simultaneously exposed to a severe environment. In general, these systems discussions should consider (1) the possibility of a single-active failure

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* C. J. Crane
Letter to R. A. Clark, NRC. Subject: Transmittal of FRC Review of Licensees' Responses to NRC EEQ SER Concerning Justification for Interim Operation
FRC, 25-Jan-82

** C. J. Crane
Letter to R. A. Clark, NRC. Subject: Transmittal of Actual Examples of Licensees' Responses to NRC EEQ SER Which Provide Adequate Rationale as a Basis for Justification of Interim Operation
FRC, 5-Feb-82

disabling the backup equipment, (2) any major differences in the characteristics of the primary and backup equipment (unless it is obvious that the equipment is essentially identical), (3) the possibility of electrical failure of the primary equipment causing an adverse effect on other safety-related equipment or power supplies, and (4) in the case of display instrumentation, the possibility of an operator being misled by the failed primary equipment. Where equipment has not been demonstrated to be qualified, some justifications discuss administrative procedures or revised operating procedures in effect. Depending upon the specific equipment involved, each of the above considerations need not be discussed in every instance, but, in general, a complete systems discussion would consider the above points.

Where equipment qualification evaluations were used, licensees generally (1) received additional information from manufacturers, (2) applied engineering judgment, (3) performed material analysis, and/or (4) used partial test data in support of the original qualification documentation. Where these evaluations were performed, the licensees determined that, although full qualification was not documented, there was sufficient evidence to suggest that the equipment would perform its intended safety function, thereby justifying interim operation until qualified equipment is installed.

Some licensees provided detailed failure-modes-and-effects analyses of electrical circuitry to demonstrate that, under all identified failure modes, the safety function of the equipment could still be accomplished.

Other justifications involved a combination of qualification information and systems information. For example, if a licensee has qualification information (such as a generic test report or other partial qualification documentation) that tends to confirm the ability of the equipment to remain operable for a specified period of time, justification for interim operation often was based upon a discussion of the required safety function being performed prior to the potential failure. This type of discussion often applies to equipment which performs a short-term trip or isolation function in the early stages of an accident.

3. PLANT-SPECIFIC REVIEW

As a result of the review, this plant was evaluated and the results documented on the "Summary of Review of Licensee's 90-Day Response" form reproduced below:

"EQUIPMENT ENVIRONMENTAL QUALIFICATION (EEQ)
Review of Licensees' Resolution of Outstanding Issues
From NRC Equipment Environmental Qualification
Safety Evaluation Reports

SUMMARY OF REVIEW
OF LICENSEE 90-DAY RESPONSE

Utility: Virginia Electric and Power Company
Plant Name: Surry Unit 2
NRC Docket No. 50-281
NRC TAC No. 42-469
NRC Contract No. NRC-03-79-118
FRC Project No. C5257
FRC Assignment No. 13
FRC Task No. 483

References:

a. R. H. Leasburg
Letter to H. R. Denton and S. A. Varga, NRC.
Subject: Response to Safety Evaluation Report for Environmental Qualification ... IE Bulletin 79-01B 90-Day Review; Surry Units 1 and 2
Virginia Electric & Power Co., 24-Aug-81
Serial No. 329

b. Office of Nuclear Reactor Regulation
Safety Evaluation Report for Surry Unit 1
Environmental Qualification of Safety-Related Electrical Equipment
NRC, 21-May-81

The Licensee has submitted technical information in Reference a in response to the NRC SER [b] on environmental qualification. FRC has reviewed these documents [a, b]. As a result of this review, FRC concludes that the Licensee has stated that the equipment items are environmentally qualified; or has provided a technically sound rationale as a basis for justification for continued plant operation; with the following exceptions:

Equipment Item	Equipment Description/ Function	SCEW Sheet No.	Status Code	Basis for Deficiency
Terminal blocks and splices	Various safety-related circuits	Para. 7.1.11 [a]	2	Note 1
ASCO solenoid valve operators	Various systems inside and outside containment	Para. 7.2.2 [a]	2	Note 2
Pumps	Charging pump component cooling water pumps	Para. 7.2.7 [a], 6-61, 6-62	2	Note 3

In general, with the exception of the items noted above, 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.

JUSTIFICATION FOR INTERIM OPERATION (JIO) STATUS CODE:

1. No justification for interim operation provided.

*2. Justification for interim operation submitted but technically deficient.

3. Justification for interim operation submitted and requires further evaluation:

   a. Systems response
   b. Non-systems response.

4. Licensee states the item is or should be exempted from qualification:

   *a. Basis for exemption technically deficient, both as an exemption request and as a justification for interim operation.

   b. Basis for exemption requires further evaluation as a justification for interim operation:

      (1) System response
      (2) Non-systems response.

*Basis for deficiency is provided in Notes 1, 2, and 3.

NOTE 1

The Licensee states:

'7.1.11 Terminal Blocks and Splices

Terminal blocks and splices of several manufacturers have been utilized in safety related circuits for Surry Units 1 and 2. Documentation to support qualification of all types of terminal blocks and splices has not been assembled.

7.1.11.1 Modification/Replacement Status

VEPCO has undertaken a program (special test 104) to verify model and serial numbers of all safety-related equipment on the master list. As a result of the special test effort, many of the terminal blocks and splices have been identified. Information we can gather generically on various manufacturers/types of terminal blocks indicate that most of all types of terminal blocks are qualifiable to meet the DOR guidelines.

Upon completion of our review of the information gathered in the field verification program, qualification packages for all types of installed terminal blocks and splices will be assembled. Where documentation deficiencies cannot be corrected in a cost effective manner, the terminal blocks or splices will be replaced by qualified terminal blocks or splices.

As part of the field verification program, all terminal blocks in safety related circuits located inside containment were replaced with qualified Raychem Splices (WCSF-N).

7.1.11.2 Modification/Replacement Schedule

The field inspection of installed terminal blocks and splices will be finalized to provide specific identification of the installed terminal blocks and splices. This inspection will be completed by the first quarter of 1982. Upon completion of this inspection, the data will be reviewed to identify any unqualified terminal blocks and splices. A schedule for replacement of any unqualified terminal blocks or splices will be developed by the end of the second quarter of 1982.

7.1.11.3 Justification for Continued Operation

The terminal blocks and splices that exist in the plant have been specified and installed in strict accordance with the established power industry practices. These terminal blocks and splices have a history of reliability and satisfactory performance under similar operating conditions.

On the basis of the above, it is reasonable to conclude that these terminal blocks and splices will perform their intended safety function when exposed to harsh environments. Therefore, continued operation of the Surry Units with this equiment, albeit incomplete qualification documentation, will have little or no impact on plant safety.'

FRC EVALUATION

FRC assumes that the remaining splices and terminal blocks that require field verification are located outside containment in HELB areas. FRC concludes that for unverified components (terminal blocks and splices) which are required to operate under DBE HELB conditions, the Licensee's contention that industry specifications and practices are adequate is not a suitable justification for interim operation unless it has been verified that those practices and specifications envelope the DBE conditions.

NOTE 2

The Licensee states:

'7.2.2 ASCO (Solenoid Operators)

7.2.2.1 Modification/Replacement Status

We are in the process of replacing all solenoids which lack complete qualification documentation with qualified components. We will replace them with ASCO NP-Series SOVs.

7.2.2.2 Modification/Replacement Schedule

Replacement SOVs have been placed on order. Based on current projections for material delivery and the present outage schedule, replacements are scheduled to start during the first quarter of 1982.

7.2.2.3 Justification For Continued Operation

The solenoid valves that exist in the plant have been specified, installed, and maintained thus far in strict accordance with established power industry practices. These valves have Class B insulation coils rated at 266 F (130C) for continuous operation. The existing solenoid valves are NEMA type 4 construction, which is a watertight and dust tight construction. Their enclosures are intended to protect enclosed components against splashing water, seepage of water, and several external environments. They are heat resistant. They are Underwriter's Laboratory (UL) listed, and Factory Manual certified, which are based on type tests. Material analysis of the existing solenoid components (i.e., insulation, plastic parts such as bobbin, o-rings and seals) indicate that they have a radiation resistance of 10E6 rads or better.

On the basis of the above, it is reasonable to conclude that these solenoid valves will perform their intended safety function when exposed to harsh environments. Therfore, continued operation of Surry Units with this equipment, albeit incomplete qualification documentation, will have little or no impact on plant safety.'

FRC EVALUATION

Although the Licensee has provided a material analysis which he maintains is reasonable assurance of operability, FRC concludes that the justification for interim operation is not adequate to provide assurance for solenoids which are required to operate after the DBE at various time intervals. The Licensee's analysis should address the specific safety function and failure modes of the solenoid valves and the effect on system operation.

NOTE 3

The Licensee states:

'7.2.7 General Electric Corporation (Charging Pump Component Cooling Water Pumps)

PLANT ID NO.	WORKSHEET PAGE NO.
1-CC-P-2A	6-61
1-CC-P-2B	6-62

7.2.7.1 Modification/Replacement Status

We will replace the charging pump component cooling water pump motors with qualified replacement units.

7.2.7.2 Modification/Replacement Schedule

Based on current projections for purchase order placement, material delivery and our present outage schedule, replacement is scheduled to start during the last quarter of 1982.

7.2.7.3 Justification For Continued Operation

The charging pump component cooling water pumps provide seal and cooling water for the mechanical seals of the charging pumps during their operation. In the event of a cooling water pump failure, the manufacturer has determined that the water reservoir surrounding the charging pump mechanical seals should provide a sufficient buffer to extend the operation of the pumps for approximately one (1) hour. Further, since during the use of charging pumps in its safety injection mode, it is handling cold water from the refueling water storage tank, which will minimize the heat load for the charging cooling system.

On the basis of the above, it is concluded that the component cooling water pumps will perform their intended safety function, and will have no impact on plant safety.'

FRC EVALUATION

FRC concludes that no assurance of operability beyond 1 hour after failure of cooling water pumps has been provided by the Licensee. The Licensee should assess the availability of alternate systems to provide the essential safety function."

APPENDIX E - REQUEST FOR ADDITIONAL INFORMATION

This appendix contains the Request for Additional Information (RAI) that was developed during the course of the review and issued to the NRC for forwarding to the Licensee. The RAI was revised throughout the review to reflect the Licensee's response(s) to the initial RAI.

The reader is cautioned that the numbers in brackets refer to citations found in the list of references at the end of this appendix and not to the citations listed in Section 6, References, of the TER.

REQUEST FOR ADDITIONAL INFORMATION

EQUIPMENT ENVIRONMENTAL QUALIFICATION (EEQ)
REVIEW OF LICENSEES' RESOLUTION OF OUTSTANDING ISSUES
FROM NRC EQUIPMENT ENVIRONMENTAL QUALIFICATION SAFETY
EVALUATION REPORTS (SER) AND TMI ACTION PLAN INSTALLED EQUIPMENT

Virginia Electric and Power Company

Surry Unit 2

NRC Docket No. 50-281

NRC TAC No. 42469

November 30, 1981
Rev. 1, April 7, 1982
Rev. 2, June 4, 1982

BACKGROUND

Franklin Research Center (FRC) of Philadelphia, Pa. is providing assistance to the U.S. Nuclear Regulatory Commission (NRC) for the equipment environmental qualification (EEQ) review of operating reactors. FRC will perform an EEQ review of the Licensee's 90-day response to outstanding issues from the NRC Equipment Environmental Qualification Safety Evaluation Report (SER) and the installed TMI Action Plan equipment. The review will be limited to safety-related equipment potentially exposed to a harsh environment. The results will be presented in the form of a technical evaluation report for each plant.

This request for additional information (RAI) is the result of an evaluation of the information provided by letters dated February 1, 1981 [1] and December 1, 1980 [2].* FRC previously requested TMI Action Plan information by a telephone memorandum dated August 12, 1981 [3].

In response, VEPCO transmitted the following information on September 10, 1981 [4].

a. Comsip-Delphi Engineering Analysis and Test Report 1035-1 on the containment hydrogen analyzers providing IEEE test results for Model KIII and KIV analyzers

b. Environmental Zone Description Volumes 1-4 for Surry Power Station.

On February 8, 1981, VEPCO transmitted a response to the FRC request for information which stated that submitting their EEQ documentation to FRC would be in violation of their Technical Specifications. The Licensee extended an invitation to FRC to audit the EEQ files at VEPCO's corporate headquarters in Richmond, Virginia [8].(1)**

*Numbers in brackets refer to citations found in the list of references.

**Throughout the text, superscript numbers in parentheses indicate the revision in which the underlined material preceding the superscript was added.

In addition to Reference 8, two other submittals were sent on March 9 and February 24, 1982 [9, 10]. These letters concerned replacing the entire complement of terminal blocks for Raychem WCSF-N splice sleeves and the Licensee's justification for interim operations.(1)

By letter dated May 18, 1982, VEPCO submitted information regarding documentation referenced in their EEQ submittal; specifically, a list of references requested and the status of these references were provided. The Licensee stated that the QDR packages requested would be forwarded under separate cover by NUS Corporation.(2)

By letter dated May 21, 1982 [10], NUS Corporation transmitted a complete set of the qualification documentation review packages along with additional status information regarding certain references requested.(2)

On May 26, 1982, FRC received the equipment qualification master lists [11] for Surry Units 1 and 2.(2)

E. 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 [5] to the NRC SER [6], a legible single copy of each of the following qualification documents is requested in order that the FRC evaluation may proceed: (The numbers in parentheses after the letter correspond to the numbers in Section 8 of Reference 5.)	
	a(2). Environmental Qualification of Reactor Coolant Temperature Detectors and Containment Pressure Transmitters, VEPCO submittal No. 855, November 1, 1979.	

***This column will be completed by FRC as the requested information is received.

DATE RECEIVED BY FRC***

b(3). Qualification of Resistance Temperature Detectors, VEPCO submittal No. 855A, for North Anna Power Station Units 1 and 2, November 1, 1979.

c(5). Learn, J. R., Boston Insulated Wire and Cable Company, to Wright, R. D., Stone & Webster Engineering Corporation, 300 V Instrument Cables and 600 V Control Cables, January 17, 1972.

d(6). Limitorque Corporation, Nuclear Qualification Data for Safety Related Service, NQDS, November 1, 1979.

e(7). Anderson, T. M., Westinghouse Electric Corporation, to Stolz, J. F., Nuclear Regulatory Commission, NS-TMA-1950, September 29, 1978. Possible attachments include: Vota, J. L., Westinghouse Electric Corporation, to Proffitt, W. L., Virginia Electric Power Company, October 19, 1978, Eicheldinger, C., Westinghouse Electric Corporation, to Stolz, J. F., Nuclear Regulatory Commission, March 23, 1977, Westinghouse Sensor Qualification Program, IEEE 323-1971 Demonstration Program, Final Test for Barton/ITT Modified Pressure Transmitter (Proprietary Class 2).

Received 3/4/82 for Tasks 497/498(1)

f(9). Anderson, T. M., Westinghouse Electric Corporation, to Stolz, J. F., Nuclear Regulatory Commission, NS-TMA-2120, September 14, 1979, Revision A, September 30, 1979. Possible attachments include: Westinghouse Supplemental Qualification Testing of Barton Lot 1 Pressure and Differential Pressure Transmitters (Proprietary Class 2).

g(12). Chapman, L., Stone, J., Tests of Electric Cables After Simulated

Received 2/12/82 for Task 495(1)

DATE RECEIVED BY FRC***

Post-Accident Reactor Containment Service, Cerro Wire and Cable Technical Report NP-04, March 1971.

h(13). Alm, C. A., Marth, J. R., Qualification of Firewall III Class IE Electric Cables, Rockbestos Company, Rockbestos Report 13-10407-E058-13-2, June 22, 1978, Updated August 22, 1978.

i(18). D. G. O'Brien Incorporated, Environmental Test Report, DGO Report No. C19QA061, February 28, 1972. — 5/24/82 [12](2)

k(23). Sheets M. W., Topical Report on General Electric Vertical Induction Motors, Inside Containment Recirculation Spray Pump Motors - Surry Power Station - Second Addendum to Cover Heat Aging, Radiation Exposure, Vibration, and Steam/Chemical Spray Exposure Qualification Tests, NRC Docket Nos. 50-280 and 50-281, June 12, 1973 and July 23, 1973. — Received 2/11/82 for Task 490(1)

l(24). Sheets, M. W., Topical Report on General Electric Vertical Induction Motors, Inside Containment Recirculation Spray Pumps for the Surry and North Anna Stations of Virginia Electric and Power Company, Third Addition to Cover Rebuilding Motors Using New Bearings, Docket Nos. 50-280 and 50-281, Report No. 491HA689, July 23, 1979. — 5/24/82 [12](2)

m(37). Cerro Wire and Cable Company, Qualification of Firewall III Class IE Electrical Cables, May 1976. Attachments include: Patterson, W. J., Cerro Wire and Cable Company, to Maguire, T. A., Stone & Webster Engineering Corporation, subject: Identification of cable supplied under this P.O. as Firewall III, June 9, 1976. — Received 3/4/82 for Tasks 497/498(1)

DATE RECEIVED BY FRC***

n(38). Schwencer, A., Nuclear Regulatory Commission, to Proffitt, W. L., Virginia Electric and Power Company, subject: Environmental Qualification Testing of Continental Instrumentation Cable, July 25, 1979. — 5/24/82 [12](2)

o(40). Lasky, J. S., Okonite Company, to Bonner, J., Stone & Webster Engineering Corporation, October 15, 1980. — 5/24/82 [12](2)

p(42). Ling, T. H., Anaconda Wire and Cable Company, to Bonner, J., Stone & Webster Engineering Corporation, October 28, 1980. — 5/24/82 [12](2)

q(44). Bell, C. E., General Electric Company, to Bonner, J., Stone & Webster Engineering Corporation, subject: Qualification of Inside Recirculation Pump Motors to Withstand a pH of 7-11, October 28, 1980.

r(45). Drab, J. B., Limitorque Corporation, to Reilly, P., Stone & Webster Engineering Corporation, subject: Qualification Information for Limitorque Actuators - Surry Power Station Units 1 & 2, October 8, 1980. Possible attachments include: Reilly, P., Stone & Webster Engineering Corporation, to Drab, J. B., Limitorque Corporation, two letters, September 11, 1980 and September 29, 1980, MacFarlane, I. S., Stone & Webster Engineering Corporation, Memo to Whom It May Concern, dated January 28, 1981, MacFarlane, I. S., Stone & Webster Engineering Corporation, to Drab, J. B., Limitorque Corporation, Telephone Memorandum dated December 12, 1980, MacFarlane, I. S., Stone & Webster Engineering Corporation, to McQuillan, P., Limitorque

Corporation, Telephone Memorandum dated October 27, 1980, Zarandi, VEPCO, to MacFarlane, I. S., Stone & Webster Engineering Corporation, November 7, 1980; MacFarlane, I. S., Stone & Webster Engineering Corporation, to Padulla, D. and Smith, R., VEPCO, Memo dated November 3, 1980, MacFarlane, I. S., Stone & Webster Engineering Corporation, to Padulla, D., VEPCO, Memo dated November 4, 1980.

s(47). Conax Corporation, Engineering Department Certificate to Virginia Electric and Power Company, subject: Compliance of NAS-21 revised May 5, 1972 to equipment ordered under purchase order SN-491, dated December 13, 1972.

t(51). Drab, J. B., Limitorque Corporation, to Barnhart, J. H., Stone & Webster Engineering Corporation, subject: Qualification Information for Limitorque Actuators - Surry Power Station Units 1 & 2, two letters, November 13, 1980. Possible attachments include: Barnhart, J. H., Stone & Webster Engineering Corporation, to Limitorque Corporation, November 3, 1980.

u(52). Drab, J. B., Limitorque Corporation, to MacFarlane, I. S., Stone & Webster Engineering Corporation, subject: Qualification Information for Limitorque Actuators - Surry Power Station Units 1 & 2, November 14, 1980. Possible attachments include: MacFarlane, I. S. Stone & Webster Engineering Corporation, to Drab, J. B., Limitorque Corporation, Memo - Subject: 79-01B Environmental Qualification of Equipment, dated November 12, 1980, MacFarlane, I. S., Stone & Webster Engineering

DATE RECEIVED BY FRC***

Corporation, To Whom It May Concern, Memo dated January 28, 1981; MacFarlane, I. S., Stone & Webster Engineering Corporation, to Drab, J. B., Limitorque Corporation, Telephone Memorandum dated December 12, 1980.

v(53). Kuster, J. M., Raychem Corporation, to Barnhart, J. H., Stone & Webster Engineering Corporation, subject: Flamtrol Wire & Cable, North Anna Nuclear Units 3 & 4, Stone & Webster P.O. 3190, November 17, 1980. Possible attachments include: MacFarlane, I. S., Stone & Webster Engineering Corporation, to Kuster, J., Raychem Corporation, Telephone Memorandum dated November 18, 1980.

w(54). Lewicki, R. G., Reliance Electric Company, to Barnhart, J. H., Stone & Webster Engineering Corporation, subject: VEPCO/Surry Power Station Units 1 & 2, Motor Bearing Lubricant, Reliance Part No. 4824-15-A, November 14, 1980.

x(55). Reliance Electric Company, Nuclear Power Motor Systems, Type Test Support Analysis, Random Wound Motors, Summary Report NUC-9, July 1, 1978. Includes Appendix: Seismic Report 78-R-33, Justification for Omission of Routine "End Turn Stress Analysis" for Random Wound Motors, July 10, 1978.

Received for Assignment 13(1)

y(56). Electric Power Research Institute, Evaluation and Test of Improved Fire-Resistant Fluid Lubricants for Water Reactor Coolant Pump Motors, Volume 1: Fluid Evaluation, Bearing Model Tests, Motor Tests, and Fire Test, Interim Report NP-1447, July 1980.

Received for Assignment 13 [12](2)

DATE RECEIVED BY FRC***

z(58). Kuster, J., Raychem Corporation, to MacFarlane, I. S., Stone & Webster Engineering Corporation, subject: IE Bulletin 79-01B, Environmental Qualification of Equipment, Surry Power Station Units 1 & 2, Additional Qualification of Raychem Flamtrol Wire and Cable, Spec. No. NAS-3190, December 2, 1980.

aa(60). McGowan, E. J., Raychem Corporation, Raychem-Flamtrol, Continuation of LOCA Simulation Test, Test Report EM #1403, December 9, 1977. Possible attachments include: Kuster, J., Raychem Corporation, to MacFarlane, I. S., Stone & Webster Engineering Corporation, January 27, 1981.

bb(61). Cardello, P. S., Anaconda Ericsson Incorporated, to Bonner, J., Stone & Webster Engineering Corporation, subject: VEPCO Surry Qualification Data, three letters, October 8, 1980, October 21, 1980, and December 10, 1980.

cc(64). Lasky, J. S., The Okonite Company, to Barnhart, J. H., Stone & Webster Engineering Corporation, subject: Environmental Qualification of Equipment, Surry Power Station Units 1 & 2, December 17, 1980.

dd(68). Lasky, J. S., The Okonite Company, to Barnhart, J. H., Stone & Webster Engineering Corporation, Reference: J. O. No. 12846.44, December 22, 1980. Possible attachments include: Barnhart, J. H., Stone & Webster Engineering Corporation, to Lasky, J. S., Okonite Company, December 17, 1980; MacFarlane, I. S., Stone & Webster Engineering Corporation, To Whom It May Concern, Memo dated February 3, 1981.

ee(69). Tolerico, F. A., Westinghouse Electric Corporation, to Barnhart, 5/24/82 [12](2)

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J. H., Stone & Webster Engineering Corporation, subject: Surry Power Station 1 & 2, Environmental Qualification of Hydrogen Recombiner, December 8, 1980.

ff(72). Cookinham, J. H., Westinghouse Electric Corporation, to Brown, S. C., Virginia Electric and Power Company, subject: North Anna Power Station, NUREG-0588 Equipment Qualification, October 30, 1980. Possible attachments include: Newcomb, R. C., Virginia Electric and Power Company, to MacFarlane, I. S., Stone & Webster Engineering Corporation, Memo dated December 31, 1980.

5/24/82 [12](2)

gg(73). Drab, J. B., Limitorque Corporation, to Reilly, P., Stone & Webster Engineering Corporation, subject: Qualification Information, North Anna Power Station Unit 2, September 19, 1980. Possible attachments include: MacFarlane, I. S., Stone & Webster Engineering Corporation, To Whom It May Concern, Memo dated January 28, 1981, MacFarlane, I. S., Stone & Webster Engineering Corporation, to Drab, J. B., Limitorque Corporation, Telephone Memorandum dated December 12, 1980.

hh(76). Conax Corporation, Design Qualification Test Report for a Conax Low Voltage Control Service Classification Conductor Feedthrough Assembly P/N 7641-21001, Test Report No. IPS-353.2, June 18, 1979. (Proprietary)

ii(77). Federick, W. C., Conax Corporation, to Reilly, P., Stone & Webster Engineering Corporation, subject: Environmental Qualification, Electrical Penetrations, North Anna Units 1 & 2, January 8, 1981.

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jj(79).	Kushner, J. R., Rockbestos Company, to Barnhart, J. H., Stone & Webster Engineering Corporation, subject: S & W letter of 12/12/80, Items 1.a.(1) and 1.a.(2), February 24, 1981.	
kk(80).	Ling, T. H., Anaconda Ericsson, to MacFarlane, I. S., Stone & Webster Engineering Corporation, subject: 600-Volt Power Cable, February 23, 1981.	5/24/82 [12](2)
ll(82).	Pirrong, J. S., Boston Insulated Wire & Cable Co., to Petty, K., Stone & Webster Engineering Corporation, subject: North Anna Cables, P.O. NA-265/1265, April 30, 1981.	
mm(83).	Drab, J., Limitorque Corporation, to Barnhart, J. H., Stone & Webster Engineering Corporation, Telex, May 18, 1981.	
nn(84).	Drab, J. B., Limitorque Corporation, to Barnhart, J. H., Stone & Webster Engineering Corporation, subject: Qualification Information for Surry Power Station - Units 1 & 2, May 19, 1981.	
oo(85).	Technical Report 123-1247 dated April 1973.	5/24/82 [12](2)
pp(86).	Technical Report 123-2045 Rev. A dated March 25, 1975.	5/24/82 [12](2)
qq(87).	Report No. 23-1268 Revs. dated February 26, 1975.	Received 3/11/82 for Task 505(1)
rr(88).	Report No. 123-1269 Rev. dated February 26, 1975.	5/24/82 [12](2)
ss(89).	Amphenol Design Verification Testing (DVT) Report No. 123-1275.	Received 2/8/82 for Task 485(1)
tt(90).	Qualification Report of General Electric Vertical Induction Motors	5/24/82 [12](2)

		DATE RECEIVED BY FRC***
	for Class 1E Outside Recirculation Spray Pumps.	
uu(91).	Siemens-Allis Inc. (Medium Motor Division) Equipment Qualification Random Wound Motors for Class IE Safety Related Service.	Received 3/4/82 for Task 486(1)
vv(93).	Letter dated August 1, 1969 from Robert H. Dubuc of Cerro Wire & Cable Company to Mr. Roger Clark of S & W.	
ww(94).	Cerro Wire & Cable Company Specification No. RSS-3-701 Issue 4, November 1, 1968 on Pyro-TROL III, 600 Volt Control Cables.	5/24/82 [12](2)
xx(96).	NUS-VEPCO QDR Package 5437-96-01.	5/24/82 [12](2)
yy(98).	NUS-VEPCO QDR Package 5437-SOV-02 and changed to 5437-64-01.(2)	5/24/82 [12](2)
zz(100).	NUS-VEPCO QDR Package 5437-122-01.	5/24/82 [12](2)
aaa(102).	NUS-VEPCO QDR Package 5437-121-01.	5/24/82 [12](2)
bbb(104).	NUS-VEPCO QDR Package 5437-124-01.	5/24/82 [12](2)
ccc(106).	NUS-VEPCO QDR Package 5437-119-01.	5/24/82 [12](2)
ddd(108).	NUS-VEPCO QDR Package 5437-125-01.	5/24/82 [12](2)
eee(110).	NUS-VEPCO QDR Package 5437-118-01.	5/24/82 [12](2)
fff(112).	NUS-VEPCO QDR Package 5437-123-01.	5/24/82 [12](2)
ggg(114).	NUS-VEPCO QDR Package 5437-123-02 and changed to 5437-134-01.(2)	5/24/82 [12](2)
hhh(116).	NUS-VEPCO QDR Package 5437-125A-01.	
iii(118).	NUS-VEPCO QDR Package 5437-117-01.	5/24/82 [12](2)
jjj(120).	NUS-VEPCO QDR Package 5437-127-01.	5/24/82 [12](2)

	DATE RECEIVED BY FRC***
kkk(122). NUS-VEPCO QDR Package 5437-104-01.	5/24/82 [12](2)
lll(124). NUS-VEPCO QDR Package 5437-MOV-2-01 and changed to 5437-66-01.(2)	5/24/82 [12](2)
nnn(126). NUS-VEPCO QDR Package 5437-MOV-2-02 and changed to 5437-97-01.(2)	5/24/82 [12](2)
ooo(127). NUS-VEPCO QDR Package 5437-133-01.	5/24/82 [12](2)
ppp(128). Automatic Dampers (Safety Related) Qualification Report for Electric Actuators by RCS.	5/24/82 [12](2)
qqq(134). NUS-VEPCO QDR Package 5437-124-02 and changed to 5437-135-01.(2)	5/24/82 [12](2)
rrr(135). NUS-VEPCO QDR Package 5437-128-01.	5/24/82 [12](2)
sss(136). NUS-VEPCO QDR Package 5437-103-15.	
ttt(137). NUS-VEPCO QDR Package 5437-132-01.	5/24/82 [12](2)
uuu(138). NUS-VEPCO QDR Package 5437-120-01.	
vvv(139). NUS-VEPCO QDR Package 5437-130-01.	5/24/82 [12](2)
www(140). NUS-VEPCO QDR Package 5437-103-02 and changed to 5437-136-01.(2)	5/24/82 [12](2)
yyy)141). NUS-VEPCO QDR Package 5437-105-01.	5/24/82 [12](2)
xxx(142). NUS-VEPCO QDR Package 5437-69-01.	5/24/82 [12](2)

B. FRC REVIEW OF INSTALLED TMI ACTION PLAN ITEMS

INFORMATION REQUESTED	DATE RECEIVED BY FRC***
1. References 2, 4, and 5(1) do not provide adequate detail with respect to identification of TMI Action Plan equipment installed after 1/1/81. Identification of all TMI Action Plan equipment installed after 1/1/81 is requested.	

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 [7](1) technical area or has requested extensions of implementation dates, this information is requested in order to incorporate it into the review.

C. INSTRUCTIONS FOR TRANSMITTING INFORMATION REQUESTED

1. The schedule for completion of the FRC assignment requires that the Licensee provide the requested information within 3 weeks of the date of the RAI.

2. The Licensee may transmit the requested information as follows:

   - o complete package directly to the NRC project manager

     or

   - o copy of cover letter to NRC project manager and complete package to FRC.

REFERENCES

1. Surry Unit 1 - IE Bulletin 79-01B,
TMI Review - Supplement 3, Revision 3 Change Package
Virginia Electric & Power Co.,
01-Feb-81

2. VEPCO Surry Unit 1 - IE Bulletin 79-01B
Revision 2 - Supplement 3 TMI Review
Virginia Electric & Power Co.,
01-Dec-80

3. Telephone Memorandum dated 8/12/81
C. J. Crane, J. Murphy (FRC) with D. Nabors (NRC-P.M.),
R. Newcomb and J. E. Wromiewicz (VEPCO).
Subject: RFI for Surry Units 1 and 2

4. R. H. Leasburg
Letter to H. R. Denton and S. A. Varga (NRC)
Subject IE Bulletin 79-01B Supplement 3
TMI Review, Surry Power Station
Unit Nos. 1 and 2
September 10, 1981

5. R. H. Leasburg
Letter to H. R. Denton and S. A. Varga (NRC)
Subject: Response to Safety Evaluation Report for
Environmental Qualification ... IE Bulletin 79-01B 90-Day Review;
Surry Units 1 and 2, Virginia Electric & Power Co.,
24-Aug-81
Serial No. 329

6. Office of Nuclear Reactor Regulation
Safety Evaluation Report for Surry Unit 1
Environmental Qualification of Safety-Related
Electrical Equipment
USNRC, 21-May-81

7. NUREG-0737, "Clarification of TMI Action Plan Requirements"
NRC, November 1980

8. R. H. Leasburg
Letter to S. A. Varga, NRC.
Subject: Request for Additional Information on Environment
Qualification of Safety-Related Electrical Equipment, Surry Power
Station Units 1 and 2
Virginia Electric & Power Co., 08-Feb-82
Serial No. 043(1)

9. R. H. Leasburg
Letter to H. R. Denton and S. A. Varga, NRC.
Subject: Additional Information Regarding Safety Evaluation Report for Environmental Qualification of Electrical Equipment
Virginia Electric & Power Co., 09-Mar-82(1)

10. R. H. Leasburg
Letter to S. A. Varga, NRC.
Subject: Revision to Response to SER for Environmental Qualification of Electrical Equipment; Cable Terminations and Splices; Surry Unit 2
Virginia Electric & Power Co., 24-Feb-82(1)
329A(1)

11. R. H. Leasburg
Letter to H. R. Denton and S. A. Varga, NRC.
Subject: Additional Information Environmental Qualification of Safety Related Electrical Equipment; Surry 1 and 2
Virginia Electric & Power Co., 18-May-82
Serial No. 282(2)

12. R. C. Wilson
Letter to C. J. Crane, FRC. Subject: Surry 1 and 2; Environmental Qualification of Safety Related Electrical Equipment; Submittal of Additional Information
NUS Corp., 21-May-82(2)

13. Surry Power Station Units 1 and 2; Equipment Qualification Master Lists
Virginia Electric & Power Co., 14-Apr-82(2)