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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)

ROCHESTER GAS AND ELECTRIC CORPORATION  
R. E. GINNA STATION

NRC DOCKET NO. 50-244

FRC PROJECT C5257

NRC TAC NO. 42520

FRC ASSIGNMENT 13

NRC CONTRACT NO. NRC-03-79-118

FRC TASK 454

*Prepared by*

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Nuclear Regulatory Commission  
Washington, D.C. 20555

Lead NRC Engineer: N. B. Le  
P. Shemanski

May 28, 1982

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FOREWORD

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

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T. J. DelGaizo from WESTEC Services, Inc., R. Garrison from ORFI Systems, Inc., and M. A. Fedele from Evaluation Associates, Inc., also contributed to the technical preparation of this report through subcontracts with Franklin Research Center.

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) [56],\* 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.

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\*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 [82] 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 DBAs.

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

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

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

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

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

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

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

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

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

The review of the licensees' responses indicated certain deficiencies within the scope of equipment addressed, definition of harsh environments, and adequacy of support documentation. It became apparent that generic criteria were needed for evaluating the electrical equipment environmental qualification for both SEP and non-SEP operating plants. Therefore, during the second half of 1979, the Division of Operating Reactors (DOR) of the NRC issued internally a document entitled "Guidelines for Evaluating Environmental Qualification of Class IE Electrical Equipment in Operating Reactors" [54]. (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" [54], 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 [57], specifying that licensees and applicants must meet the requirements set forth in the DOR Guidelines and NUREG-0588 regarding environmental qualification of safety-related electrical equipment in order to satisfy 10CFR50, Appendix A, General Design Criteria, Section I, Criterion 4. This Order also established that the SERs on this subject, to be prepared by the NRC staff, must be issued on February 1, 1981 and that all subsequent actions to be taken by licensees to achieve full compliance with the DOR Guidelines or NUREG-0588 must be completed no later than June 30, 1982. The Memorandum and Order established the DOR Guidelines and NUREG-0588 as acceptable interpretations of the General

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

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

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

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

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

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

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

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

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

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

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

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

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

On April 20, 1982, the NRC staff issued Generic Letter No. 82-09 [96] to all licensees, presenting the NRC's position and clarification of certain aspects of the environmental qualification requirements.

#### 1.4 SPECIFIC ISSUE BACKGROUND

By a letter dated December 15, 1977, Rochester Gas and Electric Corporation (RG&E) was requested by the NRC to address the environmental qualification of safety-related electrical equipment installed in the R. E. Ginna Station. Information requested included identification of electrical



equipment required to perform safety functions while subjected to design basis accident environments, definitions of environmental service conditions at equipment locations, and the status of environmental qualification documentation. In response to this request, RG&E provided information via submittal letters dated February 24 and December 1, 1978 (Revision 1) [44, 45].

On February 15, 1980, NRC qualification guidelines for identification and evaluation of safety-related equipment were transmitted to RG&E. By letters dated March 6 and 28, 1980, the NRC provided further guidance and a schedule to RG&E concerning submittal of qualification information.

On April 25, 1980, RG&E transmitted Revision 2 of its equipment qualification submittal to the NRC [52].

During the week of May 5, 1980, NRC and FRC representatives visited the Ginna plant site, conducted a general overview of the April 25, 1980 submittal, and inspected safety-related systems and equipment.

On May 22 and May 29, 1980, RG&E submitted additional information which supplemented the April 25, 1980 submittal.

On August 20, 1980, a Draft Interim Technical Evaluation Report (DITER) for equipment environmental qualification on the R. E. Ginna Station [75] was issued.

On October 7, 1980, representatives of the NRC, RG&E, and FRC held a meeting in Bethesda, Maryland to discuss the DITER.

On October 31, 1980, RG&E provided Revision 3 [1] to the previous submittals concerning environmental qualification of safety-related electrical equipment.

RG&E supplemented the environmental qualification submittal [1] by a letter dated December 8, 1980 [58] which supplied additional qualification documentation.

On January 3, 1981, RG&E transmitted information concerning installed TMI Action Plan equipment [60].

The final Technical Evaluation Report (TER) [59] on the qualification status of safety-related electrical equipment subject to harsh environments was issued to the NRC for the R. E. Ginna plant on March 18, 1981. The NRC Safety Evaluation Report (SER) [61], which included the technical conclusions of the TER, was issued to RG&E on June 1, 1981.

RG&E provided a response to the NRC SER by letter dated September 4, 1981 [62].

Requests for Information [76, 77, 78, 79] were transmitted by the NRC to RG&E to obtain TMI Action Plan information, correlations to NUREG-0737 [82], and qualification documentation referenced by RG&E for use in the review of the 90-day response.

RG&E responded to the requests for TMI information [76, 77] by letter dated November 6, 1981 [65] and included some qualification documents referenced in the 90-day response [62].

On February 18, 1982 [66], RG&E transmitted the qualification documentation which was requested in Reference 78.

## 2. NRC CRITERIA FOR ENVIRONMENTAL QUALIFICATION

### 2.1 CRITERIA PROVIDED BY THE NRC

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

- o DOR Guidelines, "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," November 1979 [54]
- o NUREG-0588, Revision 1, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," July 1981 [81].

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

- o IE Bulletin 79-01B, "Environmental Qualification of Class 1E Equipment," January 14, 1980; Supplement No. 1, February 29, 1980; Supplement No. 2, September 29, 1980; and Supplement No. 3, October 24, 1980 [94, 95, 55, 56]
- o NUREG-0737, "Classification of TMI Action Plan Requirements," November 1980 [82]. 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 [55] describe the application of the DOR Guidelines and NUREG-0588 to operating reactors (ORs),

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

[Question 3]

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

[NRC Answer to Question 3]

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

TABLE 1

REQUIREMENTS

ORs	OLs		CPs
	CP SER Before 7/1/74	CP SER After 7/1/74	
DOR GUIDELINES	NUREG-0588 (CAT. II)	NUREG-0588 (CAT. I)	NUREG-0588 (CAT. I) or NEW RULE WHEN IN EFFECT
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 [55] 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 [56] 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 [55] 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 [56] 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 [55], "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 [55] 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 [55] 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. )

Supplement 2 to IE Bulletin 79-01B [55] 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 [55] provides the following additional criteria:

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

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

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

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

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

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

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

### 2.2.5 Additional Clarification of Qualification Requirements

The NRC has worked with a number of licensees, at their requests, to provide further clarification on environmental qualification requirements. On January 20, 1982, the NRC issued Generic Letter No. 82-09 [96] 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<sup>1</sup> have been implemented. When these other activities are implemented, additional instruments presently not requiring qualification may require upgrading to a safety-related status and/or may require qualification. Licensees will be required at that time to qualify this instrumentation in accordance with the following criteria:
- o For new or upgraded instrumentation with a required operation date prior to the equipment qualification deadline, qualification must be accomplished by the equipment qualification deadline.

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

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

## 2. Safety-Related Equipment

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

## 3. Replacement Parts

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

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

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

1. The licensee has replacement equipment in stock that meets the DOR Guidelines or NUREG-0588, Category II, and procurement actions regarding such replacement equipment had commenced prior to May 23, 1980.
2. Replacement equipment qualified to the NUREG-0588, Category I standards does not exist.
3. Replacement equipment qualified to the NUREG-0588, Category I standards is not available to meet installation and operation schedules. Equipment qualified to the DOR Guidelines or NUREG-0588, Category II may be used for an interim period until Category I equipment is obtained and an outage of sufficient duration is available for replacement. Justification for use of the non-Category I qualified replacement equipment beyond this interim period must be submitted to the NRC for approval prior to the end of the interim period and in sufficient time for reasonable NRC review.
4. Replacement equipment qualified to NUREG-0588, Category I standards would require significant plant modifications to accommodate its use.
5. Operating performance and reliability data for the Category I equipment indicates poor overall equipment performance. For example, mean time to failure is significantly shorter for the Category I replacement equipment.
6. The use of replacement equipment qualified to NUREG-0588, Category I standards has a significant probability of creating human factor problems that will negatively affect plant safety and performance, e.g., (1) knowledge, skills and ability of existing plant staff require significant upgrading to operate or maintain the specific Category I replacement equipment; (2) the use of equipment qualified to Category I standards creates a one-of-a-kind application; or (3) maintenance, surveillance or calibration activities are unnecessarily complex.

5. Submergence Outside Containment

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

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

6. Radiation

- Q. Is the staff screening value of  $4 \times 10^7$  rads applicable to all operating reactors?
- A. No. This screening value is applicable only to PWRs with dry type containments. However, for PWRs with dry type containments, the licensee may choose to use plant specific analysis instead of the screening value. For plants with other containment types, the licensee must use plant specific analysis.

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

7. Containment Service Conditions

- Q. Must the Staff value (identified in the SERs) of  $T_{SAT}$  for PWRs and  $T_{SAT} + 20^\circ F$  for BWRs be used as the maximum in-containment temperature for the purpose of equipment qualification?
- A. No. The Staff will accept the use of these values. However, an acceptable alternative to the NRC staff's temperature criterion used for the service conditions must base that service condition on the 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, Rochester Gas and Electric Corporation, provided a response to the SER and additional qualification information in its submittals [62, 65, 66] to the NRC for the R. E. Ginna Nuclear Power Plant.

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

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

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

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



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

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

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

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

Topics not within the scope of the evaluation are:

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

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

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

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

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

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

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

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

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

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

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

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

- II.K.3.12 (PWR/W/1-1-81) Anticipatory Reactor Trip upon Turbine Trip
- II.K.3.13 (PWR/GE/7-1-81) Separation of HPCI and RCIC Initiation Signals
- II.K.3.15 (BWR/GE/7-1-81) Prevention of Spurious Isolation of HPCI and RCIC Systems
- II.K.3.19 (BWR/GE/7-1-81) Interlock on Recirculation Pump Loop
- II.K.3.21 (BWR/GE/7-1-18) Restart of Core Spray and LPCI Systems (If Hardware Changed Out)
- II.K.3.27 (BWR/GE/7-1-81) Provide Common Reference Level for Vessel Level Instrumentation (If Hardware Changed Out)

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

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

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


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

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

The checksheets contain the following information:

- o Equipment item information (see Figure 3-1), for example:
  - Solenoid Valve Located in Turbine Building (Area #7)
  - Automatic Switch Co. (ASCO) Model LB8300B61U
  - Actuates Feedwater Control Valves (V-4269, V-4270)
  - Licensee Reference 839
  - Required Operating Time: Short term (SI signal)
  - TER Checksheet No. 1
  - Reference 59, Section 4.5.2.6
  - Licensee Submittal: Page 9 [62]; Table 3, Page 1 [1]; SCEW 1
- o Qualification deficiencies identified in the SER (see Figure 3-1)
- o Licensee's response to the SER
- o Licensee's statements and rationale for qualification
- o Licensee's corrective action and replacement schedule
- o Evaluation of qualification including identification of all deficiencies
- o Evaluation of system considerations presented by the Licensee as a rationale for excluding equipment from qualification.

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

 <p>Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila. Pa. 19103 (215) 448-1000</p>	<p>NRC Contract No. NRC-03-79-11a FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _____</p>	<p>Page 1a</p>
<p>EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. ____</p>		

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

Figure 3-1. Sample Checksheet Page 1a  
"Equipment Item"

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

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

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

### 3.3 NRC QUALIFICATION CATEGORIES AND DEFINITIONS

#### o NRC Category I.a


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

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

#### o NRC Category I.b

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

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

 Franklin Research Center A Division of The Franklin Institute 20th and Race Streets, Phila., Pa. 19103 (215) 448-1000	NRC Contract No. NRC-03-79-118 FRC Project No. C5257 FRC Assignment No. 13 FRC Task No. _____	Page <b>2</b>
<b>EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. ____</b>		

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

<u>NRC REQUIREMENTS</u>	<u>DESIGNATION:</u> <u>X = DEFICIENCY</u>
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)	_____

<u>NRC QUALIFICATION CATEGORY</u>	<u>DESIGNATION:</u> <u>X = CATEGORY</u>
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.

o NRC Category II.a

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

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

o NRC Category II.b

EQUIPMENT THAT IS UNQUALIFIED

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

o NRC Category II.c

EQUIPMENT THAT SATISFIES ALL APPLICABLE REQUIREMENTS OF THE DOR GUIDELINES OR NUREG-0588 WITH THE EXCEPTION OF QUALIFIED LIFE

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



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

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

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

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

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

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

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

### 3.4 IMPLEMENTATION GUIDE FOR FULFILLING NRC CRITERIA

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

## 4. TECHNICAL EVALUATION

### 4.1 INTRODUCTION

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

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

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

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

#### 4.2 SUMMARY OF THE EVALUATION

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

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

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

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

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

TABLE 4-1  
 NUMBER OF EQUIPMENT ITEMS IN EACH QUALIFICATION CATEGORY

NRC CATEGORY	CATEGORY DESCRIPTION	NUMBER OF EQUIPMENT ITEMS
I.A	EQUIPMENT QUALIFIED----- [ EQUIPMENT ITEM NO(S).: 31, 32, 36, 61 ]	4
I.B	EQUIPMENT QUALIFICATION PENDING MODIFICATION----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 8, 9, 33, 41, 45, 46, 47, 49, 63, 65, 67 ]	16
II.A	EQUIPMENT QUALIFICATION NOT ESTABLISHED----- [ EQUIPMENT ITEM NO(S).: 10, 29, 30, 34, 35, 38, 39, 40, 43, 50, 55, 56, 57, 62, 64, 66 ]	16
II.B	EQUIPMENT NOT QUALIFIED-----	0
II.C	EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED----- [ EQUIPMENT ITEM NO(S).: 13, 14, 16, 18, 27, 37, 48, 48 ]	7
III.A	EQUIPMENT EXEMPT FROM QUALIFICATION----- [ EQUIPMENT ITEM NO(S).: 12, 15, 17, 24 ]	4
III.B	EQUIPMENT NOT IN THE SCOPE OF THE REVIEW----- [ EQUIPMENT ITEM NO(S).: 3, 7, 11, 19, 20, 21, 22, 23, 25, 26, 28, 42, 44, 51, 52, 53, 54, 58, 59, 60 ]	20
IV	DOCUMENTATION NOT MADE AVAILABLE-----	0
TOTAL		67

TABLE 4-2  
 QUALIFICATION DEFICIENCY SUMMARY

NRC REQUIREMENT	NUMBER OF DEFICIENT EQUIPMENT ITEMS
1. DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 8, 9, 29, 30, 43, 49, 50, 56, 57, 62, 63, 67 ]	17
2. ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 10, 29, 30, 34, 35, 46, 55, 64, 66, 67 ]	15
3. AGING DEGRADATION EVALUATED ADEQUATELY----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 8, 9, 33, 41, 45, 46, 47, 48, 50, 67 ]	15
4. QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 8, 9, 13, 14, 16, 18, 27, 29, 30, 33, 37, 38, 39, 40, 41, 45, 46, 47, 48, 50, 55, 67 ]	27
5. PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 41, 45, 47, 48, 50, 67 ]	11
6. CRITERIA REGARDING AGING SIMULATION (IF REQUIRED)-----	0
7. CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:	
A. - PEAK TEMPERATURE ADEQUATE----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 8, 9, 50 ]	8
B. - PEAK PRESSURE ADEQUATE----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 8, 9, 50 ]	8
C. - DURATION ADEQUATE----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 8, 9, 50 ]	8

Table 4-2 (Cont.)  
 QUALIFICATION DEFICIENCY SUMMARY

NRC REQUIREMENT	NUMBER OF DEFICIENT EQUIPMENT ITEMS
D. - REQUIRED PROFILE ENVELOPED ADEQUATELY----- [ EQUIPMENT ITEM NO(S): 1, 2, 4, 5, 6, 8, 9, 50 ]	8
E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE----- [ EQUIPMENT ITEM NO(S): 1, 2, 4, 5, 6, 8, 9, 50 ]	8
8. CRITERIA REGARDING SPRAY SATISFIED----- [ EQUIPMENT ITEM NO(S): 8, 9, 33, 45, 47 ]	5
9. CRITERIA REGARDING SUBMERGENCE SATISFIED----- [ EQUIPMENT ITEM NO(S): 33, 45, 47 ]	3
10. CRITERIA REGARDING RADIATION SATISFIED----- [ EQUIPMENT ITEM NO(S): 8, 9, 33, 34, 35, 38, 39, 40, 45, 47, 50, 55, 65 ]	13
11. CRITERIA REGARDING TEST SEQUENCE SATISFIED----- [ EQUIPMENT ITEM NO(S): 45, 47, 50 ]	3
12. CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED-----	0
13. CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED-----	0
14. CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED-----	0
15. TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED---	0
16. CRITERIA REGARDING MARGINS SATISFIED (NUREG-0588, CAT. 1)-	0

TABLE 4-3  
 LICENSEE CORRECTIVE ACTION SUMMARY

CORRECTIVE ACTION DESCRIPTION	NUMBER OF EQUIPMENT ITEMS
1. EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 8, 9, 41, 43, 45, 46, 47, 49, 65, 67 ]	15
2. EQUIPMENT MODIFICATION-----	0
3. EQUIPMENT RELOCATION ABOVE SUBMERGENCE LEVEL----- [ EQUIPMENT ITEM NO(S).: 33, 45, 47 ]	3
4. RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE-----	0
5. VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS----- [ EQUIPMENT ITEM NO(S).: 33, 56 ]	2
6. EQUIPMENT RELOCATION TO A MILD ENVIRONMENT-----	0
7. QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS-----	0
8. OTHER (FOR DETAILED DESCRIPTION SEE SPECIFIC EQUIPMENT ITEMS)-- [ EQUIPMENT ITEM NO(S).: 17, 27, 33, 38, 39, 40, 50, 55, 63 ]	9
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED (SEE SPECIFIC EQUIPMENT ITEM FOR COMPLETION DATE)----- [ EQUIPMENT ITEM NO(S).: 1, 2, 4, 5, 6, 8, 9, 27, 33, 41, 45, 46, 47, 49, 50, 55, 63, 65, 67 ]	19



Table 4-4

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM  
 =====

		FRC EQUIPMENT ITEM NUMBERS															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)																	
1.	DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE-----	X	X		X	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	X			X	X						
4.	QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)-----	X	X		X	X	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-----	X	X		X	X	X			X	X						
	B. - PEAK PRESSURE ADEQUATE-----	X	X		X	X	X			X	X						
	C. - DURATION ADEQUATE-----	X	X		X	X	X			X	X						
	D. - REQUIRED PROFILE ENVELOPED ADEQUATELY-----	X	X		X	X	X			X	X						
	E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE-----	X	X		X	X	X			X	X						
8.	CRITERIA REGARDING SPRAY SATISFIED-----									X	X						
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-----																
I.B	EQUIPMENT QUALIFICATION PENDING MODIFICATION-----	X	X		X	X	X			X	X						
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-----														X	X	
III.B	EQUIPMENT NOT IN THE SCOPE OF THE REVIEW-----													X		X	
IV	DOCUMENTATION NOT MADE AVAILABLE-----				X				X				X				
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)																	
1.	EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT-----	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						

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

		FRC EQUIPMENT ITEM NUMBERS														
		1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030
<b>I NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)</b>																
1.	DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE-----														X	X
2.	ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED-----														X	X
3.	AGING DEGRADATION EVALUATED ADEQUATELY-----															
4.	QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)-----	X		X									X		X	X
5.	PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION-----															
6.	CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)-----															
7.	CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:															
	A. - PEAK TEMPERATURE ADEQUATE-----															
	B. - PEAK PRESSURE ADEQUATE-----															
	C. - DURATION ADEQUATE-----															
	D. - REQUIRED PROFILE ENVELOPED ADEQUATELY-----															
	E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE-----															
8.	CRITERIA REGARDING SPRAY SATISFIED-----															
9.	CRITERIA REGARDING SUBMERGENCE SATISFIED-----															
10.	CRITERIA REGARDING RADIATION SATISFIED-----															
11.	CRITERIA REGARDING TEST SEQUENCE SATISFIED-----															
12.	CRITERIA REGARDING TEST FAILURES OR SEVERE ANOMALIES (IF ANY) SATISFIED-----															
13.	CRITERIA REGARDING FUNCTIONAL TESTING SATISFIED-----															
14.	CRITERIA REGARDING INSTRUMENT ACCURACY SATISFIED-----															
15.	TEST DURATION MARGIN (1 HOUR + FUNCTION TIME) SATISFIED-----															
16.	CRITERIA REGARDING MARGINS SATISFIED (NUREG-0589, CAT. 1)-----															
<b>II NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)</b>																
I.A.	EQUIPMENT QUALIFIED-----															
I.B.	EQUIPMENT QUALIFICATION PENDING MODIFICATION-----															
II.A.	EQUIPMENT QUALIFICATION NOT ESTABLISHED-----														X	X
II.B.	EQUIPMENT NOT QUALIFIED-----															
II.C.	EQUIPMENT SATISFIES ALL REQUIREMENTS EXCEPT QUALIFIED LIFE OR REPLACEMENT SCHEDULE JUSTIFIED-----	X		X									X			
III.A.	EQUIPMENT EXEMPT FROM QUALIFICATION-----	X									X					
III.B.	EQUIPMENT NOT IN THE SCOPE OF THE REVIEW-----				X	X	X	X	X	X	X	X	X	X		
IV.	DOCUMENTATION NOT MADE AVAILABLE-----															
<b>III CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)</b>																
1.	EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT-----															
2.	EQUIPMENT MODIFICATION-----															
3.	EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL-----															
4.	RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE-----															
5.	VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS-----															
6.	EQUIPMENT RELOCATION TO A MILD ENVIRONMENT-----															
7.	QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS-----															
8.	OTHER (---SEE SPECIFIC EQUIPMENT ITEM IF CHECKED---)	X												X		
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED-----														X		

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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

FER-C5257-454

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

		FMC EQUIPMENT ITEM NUMBERS															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1
NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)																	
1.	DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE-----			X	X							X	X				
2.	ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED-----	X									X						
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											
6.	CRITERIA REGARDING AGING SIMULATION SATISFIED (IF REQUIRED)-----																
7.	CRITERIA REGARDING TEMPERATURE/PRESSURE EXPOSURE:																
	A. - PEAK TEMPERATURE ADEQUATE-----					X											
	B. - PEAK PRESSURE ADEQUATE-----					X											
	C. - DURATION ADEQUATE-----					X											
	D. - REQUIRED PROFILE ENVELOPED ADEQUATELY-----					X											
	E. - STEAM EXPOSURE (IF REQUIRED) ADEQUATE-----					X											
8.	CRITERIA REGARDING SPRAY SATISFIED-----		X														
9.	CRITERIA REGARDING SUBMERGENCE SATISFIED-----		X														
10.	CRITERIA REGARDING RADIATION SATISFIED-----		X			X					X						
11.	CRITERIA REGARDING TEST SEQUENCE SATISFIED-----		X			X											
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-0564, CAT. 1)-----																
NRC QUALIFICATION CATEGORY (DESIGNATION: X = CATEGORY)																	
I.A.	EQUIPMENT QUALIFIED-----																
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-----			X													
III.A.	EQUIPMENT EXEMPT FROM QUALIFICATION-----																
III.B.	EQUIPMENT NOT IN THE SCOPE OF THE REVIEW-----						X	X	X	X					X	X	X
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-----		X														
4.	RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE-----																
5.	VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS-----											X					
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		X	X					X						

Table 4-4 (Cont.)

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM  
 =====

		FRC EQUIPMENT ITEM NUMBERS							
		1	2	3	4	5	6	7	8
10611062106310641065106610671									
NRC REQUIREMENTS (DESIGNATION: X = DEFICIENCY)									
1.	DOCUMENTED EVIDENCE OF QUALIFICATION ADEQUATE-----	X	X					X	
2.	ADEQUATE SIMILARITY BETWEEN EQUIPMENT AND TEST SPECIMEN ESTABLISHED-----				X		X	X	
3.	AGING DEGRADATION EVALUATED ADEQUATELY-----							X	
4.	QUALIFIED LIFE OR REPLACEMENT SCHEDULE ESTABLISHED (IF REQUIRED)-----							X	
5.	PROGRAM ESTABLISHED TO IDENTIFY AGING DEGRADATION-----							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-----								
	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	
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-----								
CORRECTIVE ACTION SPECIFIED (DESIGNATION: X = ACTION SPECIFIED)									
1.	EQUIPMENT REPLACEMENT WITH QUALIFIED EQUIPMENT-----				X		X		
2.	EQUIPMENT MODIFICATION-----								
3.	EQUIPMENT RELOCATION ABOVE THE SUBMERGENCE LEVEL-----								
4.	RELOCATE OR SHIELD EQUIPMENT FROM RADIATION SOURCE-----								
5.	VERIFY QUALIFICATION BY ADDITIONAL TESTING/ANALYSIS-----								
6.	EQUIPMENT RELOCATION TO A MILD ENVIRONMENT-----								
7.	QUALIFICATION TESTING OF EQUIPMENT IN PROGRESS-----								
8.	OTHER (SEE SPECIFIC EQUIPMENT ITEM IF CHECKED)-----		X						
SCHEDULE FOR COMPLETION OF CORRECTIVE ACTION(S) HAS BEEN PROVIDED-----			X		X		X		

#### 4.3 METHODOLOGY USED BY THE LICENSEE

This section includes observations concerning the Licensee's qualification methodology presented in the response [62] to the NRC SER.

##### 4.3.1 Aging and Qualified Life

The Licensee has not adequately addressed the related topics of aging and qualified life. The DOR Guidelines require that the Licensee:

- o establish the qualified life for all equipment items containing components susceptible to degradation produced by heat and nuclear radiations
- o implement programs to review detailed surveillance and maintenance records to assure that equipment that exhibits age-related degradation is identified and replaced (or modified) as necessary
- o establish justifiable replacement schedules (where necessary) to maintain qualification of equipment.

The qualified life of equipment is the maximum period of service under specified conditions for which it can be demonstrated that the functional capability at the end of the period is adequate for the equipment to perform its specified safety function(s) for applicable design basis events. The qualified life may be contingent on implementation of a specified maintenance program. It is acceptable for the qualified life of some subcomponents of an equipment item to be less than the qualified life of the item itself, provided a program for replacement of such components at intervals not exceeding their qualified lifetimes is specified and fulfilled. The qualified life of an equipment item may be changed during its installed life when justified by new information that permits a reanalysis of the qualification program.

Establishing the qualified life for equipment is a technically challenging task because of the paucity of information concerning the degradation of assemblies of materials and components under long-term exposure to the combined environmental service conditions in a nuclear power generating station. As is discussed more fully in Reference 1417, with the possible exception of certain simple items, there is no rigorous basis for establishing equipment qualified lifetimes for periods approaching an installed lifetime of 40 years. Further-

more, applicable information regarding possible long-term synergistic effects of temperature, humidity, nuclear radiations, etc., is extremely limited.

The Licensee has supplied information in Reference 30 on its surveillance/maintenance program for detection of age-related failure. This program is based on the detection, documentation, and resolution of failures during operation, testing, or calibration. According to the Licensee, failures are reviewed and, where aging is suspected, similar components will be investigated and corrective actions initiated, if necessary.

It is noted that a suitable surveillance program should monitor deterioration and help to verify qualified life estimates. That is, the program should indicate how much deterioration has accumulated and, as far as possible, how much functional resource remains before the end point is reached, beyond which environmental stress could cause failure. Although a specific end point for the equipment may not be known, the observation of an increased rate of change in a degradation-related parameter is usually indicative of an acceleration in the depletion of remaining resources. The parameters surveyed should be based on careful review of equipment failure modes and potentially significant degradation mechanisms. It is imperative that engineering analysis, judgment, and experience be employed in properly evaluating the data obtained through the surveillance program so that corrective action can be taken before the end point is reached. With judicious selection, one or two parameters may prove sufficient to represent multiple degradation mechanisms.

The Licensee's surveillance program does not specifically address degradation-related parameters. The Licensee has provided no information indicating how detected failures or failure modes are correlated to specific age-degradation concerns. Although indication of increased failure rate can provide evidence of age-related degradation in populations of equipment items, it is not adequate as a sole means of monitoring these effects. If observable increases in failure frequency are relied on for detecting age-related phenomena, significant aging may already have occurred in equipment, thereby increasing the potential for common-mode failure under abnormal stress conditions before corrective action can be taken. Relying solely on

observable increases in the number of failures as a means of monitoring age-degradation can make initial detection difficult, especially when equipment populations have mixed ages.

The Licensee has provided no information on preventive maintenance programs which reliably maintain the equipment below end point conditions. Preventive maintenance actions should particularly address those degradation mechanisms which affect the ability of the equipment to perform its safety function and should ensure that the degraded components and materials are refurbished or replaced as necessary to maintain qualification. 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. The balance of preventive maintenance actions, such as realignment and recalibration, are designed to keep equipment performance within specifications.

#### 4.3.2 Completeness of Equipment List

##### 4.3.2.1 Equipment Important to Safety

The NRC SER [61], Section 3.1, and TER-C5257-178 [59], Section 4.1.1, address certain equipment important to safety which the Licensee had not included on its equipment list. The Licensee responded as follows [62]:

- "3. In Section 4.1.1, it is stated that certain identified safety-related equipment was not included in the list of equipment to be qualified. Each item is discussed below:
- a. solenoids controlling air-operated containment isolation valves - Only those solenoids in a 'harsh' environment were identified in our previous submittals. Other solenoids will be addressed in future submittals. Since these are located in a "mild" environment, discussion can be deferred at this time.
  - b) solenoids controlling air-operated valves 4561 and 4562 - same as a) above.
  - c) motorized valve actuators for valves 313, 813, and 814 - As noted for solenoids controlling air-operated valves, RG&E did not generally address MVA's in a mild environment. This will be done in future submittals. Discussion of these items can be deferred in the interim, since they are located in a mild environment.



- d) other motorized valve actuators for other containment isolation valves - same as c) above.
  - e) motorized valve actuators for 704 A, B - These MVA's will see a harsh radiation environment during post-LOCA sump recirculation. Their qualification is addressed in RG&E's Reference 53; however, they were not specifically identified in our October 31, 1980 submittal. These MVA's will be added to item 8E of Table 3 of that submittal.
4. In Section 4.1.1, FRC notes that certain electrical equipment was identified in the DITER, but not addressed in RG&E's October 31, 1980 submittal. The equipment, and reason for not including it, follows:
- a) junction boxes and terminal boards located outside containment - Most of these items are located in a 'mild' environment. An evaluation of the effects of a steam line break in the intermediate building on such items is still under review. Since the Standby AFW System, used to mitigate a steamline break, is located outside the intermediate building, it is not expected that this would be a concern. However, the evaluation will be provided when completed.
  - b) control stations - this equipment is located in a 'mild' environment. Discussion can thus be deferred.
  - c) Class 1E medium voltage switchgear - same as b) above.
  - d) Class 1E motor control centers - same as b) above.
  - e) inverters - same as b) above.
  - f) battery chargers - same as b) above.
  - g) hydrogen monitors - This equipment is being procured and installed as a 'TMI modification.' Qualification documentation will be provided in accordance with the NRC's Generic Letter 81-05 dated January 19, 1981.
  - h) charcoal filter deluge valves - These valves are 'additional protection,' useful but not required for protection of the charcoal filters. Although it is expected that these valves would operate, no credit is taken for these valves in the plant safety analysis. Qualification is thus not required."

The Licensee's response as outlined above has been evaluated and found to adequately resolve the SER and TER concerns. Further discussion and evaluation of other equipment items of concern are contained in Appendix C of this report.

#### 4.3.2.2 Equipment Identified in the Emergency Procedure

TER-C5257-178 [59], Section 4.1.1, expressed the concern:

"The Licensee discusses the concept that not all equipment mentioned in the Emergency Procedures needs to be qualified, but it is not clear how the Licensee determined (a) which items of instrumentation and control to include and (b) how the operator will know which instruments are likely to be giving reliable information."

The Licensee responded to this concern as follows [62]:

"In Section 4.1.1 of the TER, it is noted that RG&E did not attempt to qualify all equipment mentioned in the Emergency Procedures, and no criteria for selection was presented. The following is RG&E's rationale:

RG&E has selected for qualification those items which are safety-related, and perform a necessary post-accident mitigation function. Other items specified in the Emergency Procedures provide additional flexibility to the operator in performing post-accident functions; they are not required, and no credit for the operation of these items is taken in the plant safety analyses.

The potential for operator confusion, based on erroneous indications of non-qualified equipment, is accounted for in the Emergency Procedures. Specific requirements are detailed in the discussion of the particular instrumentation, and will be discussed later in this attachment."

It is considered that the Licensee's response adequately resolves this issue.

#### 4.3.2.3 Equipment Located in HELB Areas

TER-C5257-178 [59], Section 4.1.2, expressed the concern:

"As is noted in Section 4.1.1, it is not clear that the Licensee has included all HELB environments that should be considered, including water sprays. Supplement 2 to IE Bulletin 79-01B states that the Licensee should apply the guidance presented in Regulatory Guide 1.46 and Standard Review Plans 3.6.1 and 3.6.2. The Licensee states:

'The failure of steam heating lines in the Auxiliary Building was identified and discussed in Reference (HELB-1). It has been determined that steam heating lines also traverse other areas in the vicinity of safety related equipment (Reference HELB-15). Modifications are planned which will isolate the steam heating line to the affected areas in the event of a failure and therefore preclude an adverse environment. The commitment to perform analyses/modifications for those pipe breaks outside containment are given in Reference (HELB-13). Prior to its installation, regular inspections are being performed to reduce the likelihood of a failure creating an adverse environment.'

This statement suggests that there may be additional equipment subject to a harsh environment beyond that listed in Appendix B or that the environmental service conditions may be more severe for some of the listed equipment than has been assumed in the analyses provided to date."

The Licensee responded to this concern as follows [62]:

"In Section 4.1.1 of the TER, it is stated that it was unclear if the criteria used by RG&E for selection of systems to be evaluated were in accordance with the DOR Guidelines. This confusion arises from the NRC review of SEP Topic III-5.B, 'Pipe Break Outside Containment'. In the resolution of this topic, RG&E committed to make modifications to the steam heating lines, or provide leak detection in the vicinity of required safety-related electrical equipment, such that a harsh environment would be prevented from occurring. This modification, when complete, will negate the need to evaluate the effects of a harsh environment on the electrical equipment. Justification for the present arrangement, until modifications are made, are presented in the SEP topic review documentation."

It is considered that the Licensee's response adequately resolves this issue.

#### 4.3.3 Environmental Service Conditions

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

In response to the NRC SER [61] Section 3.3 concerns, the Licensee stated [62]:

"In Section 3.3, the NRC concludes that the Ginna specified peak post-LOCA temperature should be the steam saturation temperature corresponding to the total building pressure, rather than the steam saturation temperature corresponding to the partial pressure of steam only. This would include margin to account for higher than average

temperatures in the upper regions of the containment that can exist due to stratification, especially following a steam line break.

RG&E does not intend to modify the Ginna post-accident temperature profile, since we have serious reservations concerning both the method of imposition of this new requirement, and its technical validity for Ginna. As expressed in the attachment to our February 20, 1981 response to the NRC's 'Partial Review, Equipment Evaluation Report by the Office of Nuclear Reactor Regulation':

- 'a) The purpose of the October 31, 1980 RG&E submittal was to respond to the September 19, 1980 Commission Order, requiring submittal of information to show compliance with the "DOR Guidelines." The "DOR Guidelines" explicitly state in Section 4.2.1 that "...equipment qualified for a LOCA environment is considered qualified for a MSLB accident environment in plant with automatic spray systems not subject to disabling single component failures." In Appendix A of FRC Project C5257, it is stated that "...the design of the Ginna plant satisfies these criteria." We consider it inappropriate that the staff would modify explicit previous guidance via this "Partial Review". The requirement to meet a 307°F temperature envelope is obviously beyond the requirements of the "DOR Guidelines."
- b) The apparent reason for this new requirement is to provide margin to account for higher than average temperatures in the upper regions of containment due to potential stratification. RG&E does not have any safety-related electrical equipment in this area of containment. Therefore, the basis for the staff concern does not apply to the Ginna plant.
- c) Since it is not conceivable that all the air in containment would be expelled after a LOCA or MSLB, it does not appear reasonable to determine margin in this manner. The criteria of IEEE-323-1974, together with the margin inherent in the analyses arriving at containment conditions, serve as ample assurance of the determination of conservative environmental conditions.

Further, the Ginna-specific post-accident pressure and temperature profiles are being evaluated by the NRC as part of the Systematic Evaluation Program, Topics VI-2.D and VI-3. Proper post-accident profiles will be available following conclusion of these SEP topics for Ginna'."

The Licensee has provided revised temperature/pressure environmental profiles [74]. These profiles are included in Appendix A of this report and have been used for the equipment qualification review.

#### 4.3.3.2 Qualification Time Requirement

The Licensee responded to TER-C5257-178 [59] Section 4.1.2 concerns on qualification time requirements [62]:

"In Section 4.1.2, FRC judges that RG&E has not provided acceptable justification for ignoring the 'minimum of one hour' guideline. It is then stated that the NRC's rationale for this requirement is presented in Section 2.2.4 of this report. However, Section 2.2.4 merely reiterates, with no elaboration or discussion as to its basis, the statement that '... the [NRC] 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 a single test.'

RG&E accounts for margin by specifying a conservatively calculated qualification profile, accounting for the potential occurrence of small and large breaks. Additional margin is not required.

Nevertheless, except for the reactor trip switchgear, RG&E did not specifically take credit for operating times of less than one hour in our October 31, 1980 submittal, other than for several specific pieces of equipment in the area of submergence. The guidelines of Section 2.2.2 are considered in the discussion of the specific items affected."

The selection of 1 hour-plus-operating-time as a margin for test duration applies to equipment whose safety function is performed within a short time (e.g., seconds or minutes). Exceptions to this NRC criterion (see Section 2 of this report) were presented by the NRC in July 1981 at the industry EEQ meetings held in Bethesda, Md. as follows:

"Exception: For Less Than 1 Hour:

- o Provide assurance specified time is required functional time for entire spectrum of DBE.
- o Subsequent failure of equipment will not degrade the safety of the plant or mislead an operator.
- o Equipment not required after primary function accomplished."

The Licensee has not provided an acceptable alternative to the specified NRC requirements.

#### 4.3.3.3 Containment Spray

Section 3.2 of the NRC SER [61] required that the Licensee verify that the Ginna containment spray system is an automatic system which satisfies the single failure criterion. In response, the Licensee stated [62]:

"In Section 3.2., it is stated that the NRC requires the licensee to verify that the Containment Spray System is not subject to a disabling single component failure. This has been done. The Containment Spray System is a fully-redundant system, not subject to credible disabling single component failures. The single suction line from the RWST, with valves 896A and 896B, in series, has been addressed in the Ginna Technical Specification, Section 3.3.1.1.g. RG&E's 'ECCS Single Failure' analysis, accepted by the NRC staff in Amendment No. 7, was again reviewed and accepted by letter from Dennis M. Crutchfield, NRC, to John E. Maier, RG&E, 'SEP Topics VI-7.C and VI-7.C.2,' dated February 20, 1981. The Ginna Containment Spray System thus satisfies the DOR Guideline requirements of Section 4.2.1."

It is considered that this SER concern has been resolved.

#### 4.3.3.4 Submergence

Section 3.5 of the NRC SER [61] requested that the Licensee provide the flood level elevation in containment, in addition to the flooded depth. An assessment of failure modes associated with the submergence of equipment was also requested. The Licensee responded in the following manner [62]:

"In Section 3.5, the NRC states that RG&E provided information relative to maximum submergence in containment (7 feet), but not the elevation level. The elevation of the containment basement floor is 235'8", the maximum submerged elevation level is thus 242'8". This information will be added to Table 4 of RG&E's report.

In Section 3.5, it is stated that the licensee should provide an assessment of the failure modes associated with submergence of equipment, and ensure that subsequent failures of the equipment will not adversely affect the safety functions or mislead an operator. RG&E provides such information for each potentially affected item of equipment, as well as time of flooding if applicable, in the discussion of the individual equipment items."

It is considered that this SER concern has been resolved.

#### 4.3.4 Nuclear Radiation Dose

Section 4.1.2 of TER-C5257-178 [59] stated:

"The Licensee has used an integrated nuclear radiation dose of 160 Mrd for equipment within containment. FRC has assumed that this value includes both beta and gamma radiations. The Guidelines permit a lower integrated dose value for equipment which would not be affected by beta radiations. In the case of electric cables, protection against beta radiation would be desirable. A more detailed discussion is presented in Appendix H. In addition, the Guidelines require consideration of radiation exposure to equipment outside containment due to recirculating radioactive fluid. This was not consistently done by the Licensee."

The Licensee provided the following response [62]:

"In Section 4.1.2, Nuclear Radiation Dose, reference is made to Appendix H of the TER, entitled, 'Effects of Nuclear Radiation Dose Rate on Cable Performance During a LOCA.' This appendix makes reference to the fact that greater degradation may occur at higher dose rates than were used in qualification testing. It should be noted that this 'finding' has not been previously addressed in NRC criteria, including the DOR Guidelines. Furthermore, no specific references in the technical literature are cited, which makes it impossible for the RG&E technical staff to review the validity or applicability of the data. In general, RG&E testing and analysis related to dose rate in insulating materials is consistent with IEEE Std. 278, 'USIA and IEEE Guide for Classifying Electrical Insulating Materials Exposed to Neutron and Gamma Radiation.' Since failure of electrical cables to perform their required safety functions due to higher dose rates is still the subject of research, and clearly beyond present-day regulatory criteria, we consider that it is inappropriate for discussion in this review. RG&E considers that the radiation qualification requirements specified for Ginna are very severe, and that equipment shown operable after exposure to this dose would operate in a post-accident environment. RG&E has reviewed several other plant TER's not prepared by FRC, and did not find this to be an area of concern. These other reviews appear to be more consistent with the DOR Guidelines. A consistent approach should be used for Ginna."

The Licensee has addressed only part of the concern identified in the TER [59]. The first concern was whether the effect of beta radiation had been considered as required by the DOR Guidelines (Section 4.1.2, Beta Radiation Doses). The Licensee has not adequately addressed this concern.

The second concern was whether the effects of radiation dose and dose rate occurring during the accident on cable characteristics such as insulation resistance had been considered by the Licensee. Test data on these effects

have been available to cable manufacturers and NSSS suppliers since 1974 and the need to consider these effects has also been recognized by IEEE in developing Standard 383-74. It is the responsibility of the Licensee to establish that the safety-related cables perform the required functions during the accident as well as in the post-accident period.

#### 4.4 EQUIPMENT ENVIRONMENTAL QUALIFICATION EVALUATION

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



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 ! EQUIPMENT ENVIRONMENTAL QUALIFICATION !
   
 ! EQUIPMENT ITEM CHECKSHEET INDEX !
   
 =====

FRC ITEM NO.	COMPONENT	MANUFACTURER	MODEL NUMBER	LOCATION
1	SOLENOID VALVE	ASCO	LR8300B61U	TURBINE BLDG.
2	SOLENOID VALVE	ASCO	LR8300B64RU	TURBINE BLDG.
3	SOLENOID VALVE	COPE'S VULCAN	D10060	AUXILIARY BLDG.
4	SOLENOID VALVE	LAWRENCE	110114W	INTERMEDIATE BLDG.
5	SOLENOID VALVE	LAWRENCE	125434W	INTERMEDIATE BLDG.
6	SOLENOID VALVE	VERSA	V5G	CONTAINMENT BLDG., AREA 1
7	SOLENOID VALVE	ASCO	ND	AUXILIARY BLDG.
8	SOLENOID VALVE	VERSA	V5G3731	CONTAINMENT BLDG., AREA 1
9	SOLENOID VALVE	VERSA	V5G3421	CONTAINMENT BLDG., AREA 1
10	SOLENOID VALVE	VALCOR	V57300	CONTAINMENT BLDG., AREA 1
11	SOLENOID VALVE	JOHNSON CONTROLS	D251	CONTROL BLDG.
12	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM82 WITH RELIANCE MOTOR	INSIDE CONTAINMENT
13	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM800 WITH PEERLESS MOTOR	AUXILIARY BLDG.
14	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM800 WITH RELIANCE MOTOR	AUXILIARY BLDG.
15	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM800 WITH RELIANCE MOTOR	INTERMEDIATE BLDG., AREA 3
16	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM800 WITH RELIANCE MOTOR	AUXILIARY BLDG., AREA 2
17	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM800 WITH PEERLESS MOTOR	CONTAINMENT BLDG., AREA 6
18	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM81 WITH RELIANCE MOTOR	CONTAINMENT BLDG., AREA 1
19	MOTORIZED VALVE ACTUATOR	LIMITORQUE	SM800 WITH RELIANCE MOTOR	AUXILIARY BLDG., AREA 6
20	ELECTRIC MOTOR	GENERAL ELECTRIC	TYPE K 250HP	AUXILIARY BLDG., ANNEX
21	ELECTRIC MOTOR	WESTINGHOUSE	444TSTBDP 200 HP	AUXILIARY BLDG.
22	ELECTRIC MOTOR	WESTINGHOUSE	444TSTBDP 150 HP	AUXILIARY BLDG.
23	ELECTRIC MOTOR	WESTINGHOUSE	445TSTBDP	AUXILIARY BLDG.
24	ELECTRIC MOTOR	WESTINGHOUSE	505USABDP	INTERMEDIATE BLDG., BASEMENT
25	ELECTRIC MOTOR	WESTINGHOUSE	509USAFDP 350 HP	AUXILIARY BLDG.
26	ELECTRIC MOTOR	WESTINGHOUSE	509UPHABDP 300 HP	SCREEN HOUSE
27	ELECTRIC MOTOR	WESTINGHOUSE	TEFC 2 HP	CONTAINMENT BLDG., AREA 1
28	ELECTRIC MOTOR	U.S. ELECTRIC MOTORS	VEU 100 HP CLASS B INSULATION	AUXILIARY BLDG.
29	ELECTRIC MOTOR	WESTINGHOUSE	SBDP 2 HP CLASS B INSULATION	AUXILIARY BLDG.
30	ELECTRIC MOTOR	WESTINGHOUSE	SBDP 3 HP CLASS B INSULATION	AUXILIARY BLDG.
31	ELECTRICAL PENETRATION	CROUSE-HINDS	ND	CONTAINMENT BLDG., AREA 1
32	ELECTRICAL PENETRATION	WESTINGHOUSE	ND	CONTAINMENT BLDG., AREA 1
33	TERMINAL BLOCK	WESTINGHOUSE	542247	CONTAINMENT BLDG., AREA 1
34	ELECTRICAL CABLE, CONTROL	KERITE	TYPE HT	CONTAINMENT BLDG., AREA 1
35	ELECTRICAL CABLE, POWER	KERITE	TYPE HT	CONTAINMENT BLDG., AREA 1
36	ELECTRICAL CABLE, CONTROL	KERITE	TYPE HT	CONTAINMENT BLDG., AREA 1
37	ELECTRICAL CABLE	COLEMAN CABLE	ND	OUTSIDE CONTAINMENT
38	ELECTRICAL CABLE	COLEMAN CABLE	ND	CONTAINMENT BLDG., AREA 1
39	ELECTRICAL CABLE	ROME CABLE	ND	OUTSIDE CONTAINMENT
40	ELECTRICAL CABLE	GENERAL CABLE	ND	OUTSIDE CONTAINMENT
41	LEVEL TRANSMITTER	FOXBORO	611GHAST	AUXILIARY BLDG.
42	LEVEL SWITCH	BARTON	289	AUXILIARY BLDG.
43	FLOW TRANSMITTER	BARTON	332	CONTAINMENT BLDG., AREA 1
44	PRESSURE TRANSMITTER	BARTON	332	INTERMEDIATE BLDG.
45	PRESSURE TRANSMITTER	FOXBORO	611GHDSI	CONTAINMENT BLDG., AREA 1
46	PRESSURE TRANSMITTER	FOXBORO	611GHDSI	INTERMEDIATE BLDG., AREA 3
47	LEVEL TRANSMITTER	FOXBORO	613MHDI MODIFIED	CONTAINMENT BLDG., AREA 1
48	LEVEL TRANSMITTER	FOXBORO	613DHST	AUXILIARY BLDG., AREA 2
49	LEVEL TRANSMITTER	FOXBORO	613MHST	CONTAINMENT BLDG., AREA 1
50	RTD	ROSEMOUNT	176JA	CONTAINMENT BLDG., AREA 1

\*\*\*\*\*  
 ! EQUIPMENT ENVIRONMENTAL QUALIFICATION !  
 ! EQUIPMENT ITEM CHECKSHEET INDEX !  
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FRC ITEM NO.	COMPONENT	MANUFACTURER	MODEL NUMBER	LOCATION
51	BATTERY	GOULD	FTA19	CONTROL BLDG., AREA 8
52	MOTOR-GENERATOR CONTROLS	ALCO DIESEL ENGINE	251F	D/G ANNEX AREA, AREA 4
53	DIESEL GENERATOR	WESTINGHOUSE	1900 KW	D/G ANNEX AREA, AREA 4
54	ELECTRIC MOTOR	WESTINGHOUSE	TEFC	D/G ANNEX AREA, AREA 4
55	ELECTRIC MOTOR	WESTINGHOUSE	558.5 CSP	CONTAINMENT BLDG., AREA 1
56	SWITCHGEAR	WESTINGHOUSE	DR50A1600A	INTERMEDIATE BLDG., AREA 3
57	SWITCHGEAR	WESTINGHOUSE	DH350E1200A	TURBINE BLDG., AREA 7
58	PANEL, I AND C	FOXBORO	ND	CONTROL BLDG., AREA 8
59	PANEL, DISTRIBUTION	WESTINGHOUSE	ND	CONTROL BLDG., AREA 8
60	HVAC EQUIPMENT	WESTINGHOUSE	Z162	CONTROL BLDG., AREA 8
61	ELECTRICAL CABLE SPLICE	KAYCHEN	WCSFN	CONTAINMENT BLDG., AREA 1
62	LEVEL SWITCH	GENS	SPECIAL: SIMILAR TO LS1900	CONTAINMENT BLDG., AREA 1
63	HYDROGEN RECOMBINER	WESTINGHOUSE	GLA PART 43737 REV A	CONTAINMENT BLDG., AREA 1
64	LIMIT SWITCH	ALCO	ND	CONTAINMENT BLDG., AREA 1
65	TRANSFORMER	SCHAEVITZ	500HCA	CONTAINMENT BLDG., AREA 1
66	SOLENOID VALVE	VALCOR	ND	CONTAINMENT BLDG., AREA 1
67	PRESSURE TRANSMITTER	BARTON	332	AUXILIARY BLDG.



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NRC Contract No. NRC-03-79-118  
 FRC Project No. C5257  
 FRC Assignment No. 13  
 FRC Task No. 454

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 1a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

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) (Q1) RT, (P) H, CS, (A) S, (R), M, I, (QM), RPN, EXN, SEN, (QI), RPS, None,  
 Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



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

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 1

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.6 addresses solenoid valves in the turbine building.  
RG&E has committed to replace this equipment by June 30, 1982.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

Equipment Item No. 2  
 Solenoid Valves Located in Turbine Building (Area #7)  
 Automatic Switch Co. (ASCO) Model LB8300B64RU  
 Actuates Feedwater Bypass Valves (V-4271, V-4272)  
 Licensee Reference 1617  
 Required Operating Time: Short term (SI signal)  
 TER Checksheet No. 2  
 Reference 59, Section 4.5.2.6  
 Licensee Submittal: Page 9 [62]; Table 3, Page 1 [1]; FRC SCEW 2

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (~~has~~/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
 X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.6 addresses solenoid valves in the turbine building.  
RG&E has committed to replace this equipment by June 30, 1982.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

Equipment Item No. 3  
 Solenoid Valves Located in Auxiliary Building (Area #2)  
 Copes-Vulcan Co. Model D-100-60  
 Actuates NaOH to CS Valves (AOV-836 A,B)  
 Licensee Reference 1617  
 Required Operating Time: Short term (minutes)  
 TER Checksheet No. 3  
 Reference 59, Section 4.7.5  
 Licensee Submittal: Table 3, Page 1 [1]; FRC SCEW 3

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-Deferred

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 | <u>III.b</u> Not in Scope      |
| II.b Not Qualified                 | IV Documentation Not Available |



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
 X = DEFICIENCY

- Documented Evidence of Qualification Adequate \_\_\_\_\_
- Adequate Similarity Between Equipment and Test Specimen Established \_\_\_\_\_
- Aging Degradation Evaluated Adequately \_\_\_\_\_
- Qualified Life or Replacement Schedule Established (If Required) \_\_\_\_\_
- Program Established to Identify Aging Degradation \_\_\_\_\_
- Criteria Regarding Aging Simulation Satisfied (If Required) \_\_\_\_\_
- Criteria Regarding Temperature/Pressure Exposure:
  - o Peak Temperature Adequate \_\_\_\_\_
  - o Peak Pressure Adequate \_\_\_\_\_
  - o Duration Adequate \_\_\_\_\_
  - o Required Profile Enveloped Adequately \_\_\_\_\_
  - o Steam Exposure (If Required) Adequate \_\_\_\_\_
- Criteria Regarding Spray Satisfied \_\_\_\_\_
- Criteria Regarding Submergence Satisfied \_\_\_\_\_
- Criteria Regarding Radiation Satisfied \_\_\_\_\_
- Criteria Regarding Test Sequence Satisfied \_\_\_\_\_
- Criteria Regarding Test Failures or Severe Anomalies  
 (If Any) Satisfied \_\_\_\_\_
- Criteria Regarding Functional Testing Satisfied \_\_\_\_\_
- Criteria Regarding Instrument Accuracy Satisfied \_\_\_\_\_
- Test Duration 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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

Equipment Item No. 4  
 Solenoid Valves Located in Intermediate Building (Area #3)  
 Lawrence Co. Model 110114W  
 Actuates Main Steam Isolation Valves - Supply Side (V-3516)  
 Licensee Reference 18  
 Required Operating Time: Very short (seconds)  
 TER Checksheet No. 4  
 Reference 59, Section 4.5.2.10  
 Licensee Submittal: Page 10 [62]; Table 3, Page 1 [1]; FRC SCEW 4

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

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

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, <del>3b</del> , <del>3c</del> , <del>3d</del>
System Consideration Review	<del>4a</del> , <del>4b</del> , <del>4c</del> , <del>4d</del> , <del>4e</del> , <del>4f</del>
Equipment Environmental Qualification Review	5a, 5b, 5c, 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:

- 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 June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
 X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.





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NRC Contract No. NRC-03-79-118  
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FRC Assignment No. 13  
FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 4

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.10 addresses solenoid valves for the main steam isolation valves. RG&E has committed to replace these valves by June 30, 1982.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

Equipment Item No. 5  
 Solenoid Valves Located in Intermediate Building (Area #3)  
 Lawrence Co. Model 125434W  
 Actuates Main Steam Isolation Valves - Vent Side (V-3517)  
 Licensee Reference 18  
 Required Operating Time: Very short (seconds)  
 TER Checksheet No. 5  
 Reference 59, Section 4.5.2.10  
 Licensee Submittal: Page 10 [62]; Table 3, Page 1 [1]; FRC SCEW 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:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (~~has~~/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



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

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.10 addresses solenoid valves for the main steam isolation valves. RG&E has committed to replace these valves by June 30, 1982.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

Equipment Item No. 6  
 Solenoid Valves Located Inside Containment (Area #1)  
 Versa Valve Co. Model VSG  
 Actuates Containment Recirculation System Dampers (V-5871 through V-5876)  
 Licensee Reference 19  
 Required Operating Time: Very short (seconds)  
 TER Checksheet No. 6  
 Reference 59, Section 4.5.2.11  
 Licensee Submittal: Page 10 [62]; Table 3, Page 1 [1]; FRC SCEW 6

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

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

- The Licensee (~~has~~/~~has not~~) provided a response to the SER concerns.
- The Licensee (~~has~~/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (~~has~~/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (~~has~~/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                                   |                                |
|---------------------------------------------------|--------------------------------|
| I.a Qualified                                     | II.c Qualified Life Deficiency |
| <input checked="" type="radio"/> I.b Modification | III.a Exempt                   |
| II.a Qualification Not Established                | III.b Not in Scope             |
| II.b Not Qualified                                | IV Documentation Not Available |



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

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
 X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.





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NRC Contract No. NRC-03-79-118

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FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 6

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.11 addresses solenoid valves for the containment recirculation system dampers. RG&E has committed to replace these solenoid valves by June 30, 1982.



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

Equipment Item No. 7  
 Solenoid Valves Located in Auxiliary Building (Area #2)  
 Automatic Switch Co. (ASCO), Model Not Stated  
 Actuates SI Recirculation Valves (AOV-897, 898)  
 Licensee Reference 1617  
 Required Operating Time: Short term (before sump recirculation)  
 TER Checksheet No. 7  
 Reference 59, Section 4.7.4  
 Licensee Submittal: Table 3, Page 2 [1]; FRC SCEW 7

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

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

Not stated, Not applicable  
Deferred

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 2**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 | <b>III.b</b> Not in Scope      |
| II.b Not Qualified                 | 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 \_\_\_\_\_
- Aging Degradation Evaluated Adequately \_\_\_\_\_
- Qualified Life or Replacement Schedule Established (If Required) \_\_\_\_\_
- Program Established to Identify Aging Degradation \_\_\_\_\_
- Criteria Regarding Aging Simulation Satisfied (If Required) \_\_\_\_\_
- Criteria Regarding Temperature/Pressure Exposure:
  - o Peak Temperature Adequate \_\_\_\_\_
  - o Peak Pressure Adequate \_\_\_\_\_
  - o Duration Adequate \_\_\_\_\_
  - o Required Profile Enveloped Adequately \_\_\_\_\_
  - o Steam Exposure (If Required) Adequate \_\_\_\_\_
- Criteria Regarding Spray Satisfied \_\_\_\_\_
- Criteria Regarding Submergence Satisfied \_\_\_\_\_
- Criteria Regarding Radiation Satisfied \_\_\_\_\_
- Criteria Regarding Test Sequence Satisfied \_\_\_\_\_
- Criteria Regarding Test Failures or Severe Anomalies  
 (If Any) Satisfied \_\_\_\_\_
- Criteria Regarding Functional Testing Satisfied \_\_\_\_\_
- Criteria Regarding Instrument Accuracy Satisfied \_\_\_\_\_
- Test Duration 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



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

Equipment Item No. 8  
 Solenoid Valves Located Inside Containment (Area #1)  
 Versa Valve Co. Model VSG-3731  
 Actuates Containment Purge Valves (Plant ID Not Stated)  
 Licensee Reference 19  
 Required Operating Time: Seconds  
 TER Checksheet No. 8  
 Reference 59, Section 4.6.9  
 Licensee Submittal: Page 13 [62]; Table 3, Page 2 [1]; FRC SCEW 8

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (~~has~~/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/~~has not~~) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 8

LICENSEE RESPONSE TO NRC SER

Item 4.6.9 addresses the purge and depressurization valve solenoid valves. As previously stated, RG&E has committed to replace these solenoid valves by June 30, 1982.





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

Equipment Item No. 9  
 Solenoid Valves Located Inside Containment (Area #1)  
 Versa Valve Co. Model VSG-3421  
 Actuates Containment Depressurization Valves (Plant ID Not Stated)  
 Licensee Reference 19  
 Required Operating Time: Seconds  
 TER Checksheet No. 9  
 Reference 59, Section 4.6.9  
 Licensee Submittal: Page 13 [62]; Table 3, Page 2 [1]; FRC SCEW 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:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

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

The Licensee (has/~~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 June 30, 1982.)

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

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

- |                                                   |                                |
|---------------------------------------------------|--------------------------------|
| I.a Qualified                                     | II.c Qualified Life Deficiency |
| <input checked="" type="radio"/> I.b Modification | III.a Exempt                   |
| II.a Qualification Not Established                | III.b Not in Scope             |
| II.b Not Qualified                                | IV Documentation Not Available |



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 9

LICENSEE RESPONSE TO NRC SER

Item 4.6.9 addresses the purge and depressurization valve solenoid valves. As previously stated, RG&E has committed to replace these solenoid valves by June 30, 1982.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

Equipment Item No. 10  
 Solenoid Valves Located Inside Containment (Area #1)  
 Valcor Engineering Corp. Model V57300  
 Pressurizer PORVs (Plant ID Not Stated)  
 Licensee References 1547, 1568, 1569, 1801, 1835, 2796, 2797, 2798, 2799,  
 2800, and 2801  
 Required Operating Time: Long term  
 TER Checksheet No. 10  
 Reference 59, Section 4.6.12  
 Licensee Submittal: Page 15 [62]; Table 3, Page 10 [1]; FRC SCEW 62

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                           |                                |
|-------------------------------------------|--------------------------------|
| I.a Qualified                             | II.c Qualified Life Deficiency |
| I.b Modification                          | III.a Exempt                   |
| <u>II.a</u> Qualification Not Established | III.b Not in Scope             |
| II.b Not Qualified                        | 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 \_\_\_\_\_
- Qualified Life or Replacement Schedule Established (If Required) \_\_\_\_\_
- Program Established to Identify Aging Degradation \_\_\_\_\_
- Criteria Regarding Aging Simulation Satisfied (If Required) \_\_\_\_\_
- Criteria Regarding Temperature/Pressure Exposure:
  - o Peak Temperature Adequate \_\_\_\_\_
  - o Peak Pressure Adequate \_\_\_\_\_
  - o Duration Adequate \_\_\_\_\_
  - o Required Profile Enveloped Adequately \_\_\_\_\_
  - o Steam Exposure (If Required) Adequate \_\_\_\_\_
- Criteria Regarding Spray Satisfied \_\_\_\_\_
- Criteria Regarding Submergence Satisfied \_\_\_\_\_
- Criteria Regarding Radiation Satisfied \_\_\_\_\_
- Criteria Regarding Test Sequence Satisfied \_\_\_\_\_
- Criteria Regarding Test Failures or Severe Anomalies  
 (If Any) Satisfied \_\_\_\_\_
- Criteria Regarding Functional Testing Satisfied \_\_\_\_\_
- Criteria Regarding Instrument Accuracy Satisfied \_\_\_\_\_
- Test Duration Margin (1 hour + Function Time) Satisfied \_\_\_\_\_
- Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) \_\_\_\_\_

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

LICENSEE RESPONSE TO NRC SER

Item 4.6.12 addresses the solenoid valves for the pressurizer PORV's. The original specification provided as Reference 2.48 provided information relative to the environmental qualification of these valves; the test report is not at this time available to RG&E. This will be obtained prior to June 30, 1982, to provide confirmation of the environmental qualification of these solenoid valves. The September 24, 1980 information is withdrawn as a reference for our submittal; it was incorrectly submitted.





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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 10

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



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**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11**

Equipment Item No. 11  
 Solenoid Valves Located in Basement of Control Building (Area #8)  
 Johnson Controls Model D251  
 Actuation of Control Room Air Handling Unit Dampers (Plant ID Not Stated)  
 Licensee reference not cited  
 Required Operating Time: Short term  
 TER Checksheet No. 11  
 Reference 59, Section 4.7.17  
 Licensee Submittal: Table 3, Page 11 [1]; FRC SCEW 67

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

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

Not stated, Not applicable  
DEFERRED

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 11

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 | <u>III.b</u> Not in Scope      |
| II.b Not Qualified                 | 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 \_\_\_\_\_
- Qualified Life or Replacement Schedule Established (If Required) \_\_\_\_\_
- Program Established to Identify Aging Degradation \_\_\_\_\_
- Criteria Regarding Aging Simulation Satisfied (If Required) \_\_\_\_\_
- Criteria Regarding Temperature/Pressure Exposure:
  - o Peak Temperature Adequate \_\_\_\_\_
  - o Peak Pressure Adequate \_\_\_\_\_
  - o Duration Adequate \_\_\_\_\_
  - o Required Profile Enveloped Adequately \_\_\_\_\_
  - o Steam Exposure (If Required) Adequate \_\_\_\_\_
- Criteria Regarding Spray Satisfied \_\_\_\_\_
- Criteria Regarding Submergence Satisfied \_\_\_\_\_
- Criteria Regarding Radiation Satisfied \_\_\_\_\_
- Criteria Regarding Test Sequence Satisfied \_\_\_\_\_
- Criteria Regarding Test Failures or Severe Anomalies  
 (If Any) Satisfied \_\_\_\_\_
- Criteria Regarding Functional Testing Satisfied \_\_\_\_\_
- Criteria Regarding Instrument Accuracy Satisfied \_\_\_\_\_
- Test Duration 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 \_\_\_\_\_

MILD ENVIRONMENT



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

Equipment Item No. 12  
 Motorized Valve Actuators Located Inside Containment (Area #1)  
 Limitorque Model SMB-2 with Reliance Electric Co. Motor  
 Operates Accumulator Discharge Valve (MOV-841, 865)  
 Licensee References 26, 637, and 639  
 Required Operating Time: Not required to operate  
 TER Checksheet No. 12  
 Reference 59, Section 4.4.1  
 Licensee Submittal: Page 7 [62]; Table 3, Page 2 [1]; FRC SCEW 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:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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                   | <u>III.a</u> 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. 12**

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

- Documented Evidence of Qualification Adequate \_\_\_\_\_
- Adequate Similarity Between Equipment and Test Specimen Established \_\_\_\_\_
- Aging Degradation Evaluated Adequately \_\_\_\_\_
- Qualified Life or Replacement Schedule Established (If Required) \_\_\_\_\_
- Program Established to Identify Aging Degradation \_\_\_\_\_
- Criteria Regarding Aging Simulation Satisfied (If Required) \_\_\_\_\_
- Criteria Regarding Temperature/Pressure Exposure:
  - o Peak Temperature Adequate \_\_\_\_\_
  - o Peak Pressure Adequate \_\_\_\_\_
  - o Duration Adequate \_\_\_\_\_
  - o Required Profile Enveloped Adequately \_\_\_\_\_
  - o Steam Exposure (If Required) Adequate \_\_\_\_\_
- Criteria Regarding Spray Satisfied \_\_\_\_\_
- Criteria Regarding Submergence Satisfied \_\_\_\_\_
- Criteria Regarding Radiation Satisfied \_\_\_\_\_
- Criteria Regarding Test Sequence Satisfied \_\_\_\_\_
- Criteria Regarding Test Failures or Severe Anomalies  
 (If Any) Satisfied \_\_\_\_\_
- Criteria Regarding Functional Testing Satisfied \_\_\_\_\_
- Criteria Regarding Instrument Accuracy Satisfied \_\_\_\_\_
- Test Duration 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 \_\_\_\_\_

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 12

LICENSEE RESPONSE TO NRC SER

Items 4.4.1, 4.4.2, 4.4.3, and 4.4.4 address items exempt from qualification. RG&E notes that the MVA's for MOV's 878A and 878C, located in the hot leg safety injection lines, should be included in 4.4.2, as discussed previously.





**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13**

Equipment Item No. 13  
 Motorized Valve Actuators Located in Auxiliary Building (Area #2)  
 Limitorque Model SMB-00 with Peerless Electric Co. Motor  
 Actuates BAST to SI Pump Valves (MOV-826A, B, C, D); and RWST to  
 SI Pump Valves (MOV-896A, B)  
 Licensee Reference 12  
 Required Operating Time: Short term (before sump recirculation)  
 TER Checksheet No. 13  
 Reference 59, Section 4.3.3.4  
 Licensee Submittal: Page 6 [62]; Table 3, Page 2 [1]; FRC SCEW 11, 12

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (~~has~~/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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                      | <u>II.c</u> 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 \_\_\_\_\_
- 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 \_\_\_\_\_

This equipment item was previously evaluated in Reference 59. See page 1A  
 Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

LICENSEE RESPONSE TO NRC SER

Item 4.3.3.4 addresses various MVA's in the auxiliary building. Inclusion of these valves in the maintenance/ surveillance program described in Reference 72 should relieve the concerns relative to aging.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

NOTES:

1. Licensee has identified this equipment item as SMB- $\phi\phi$  with a Peerless Electric Co. Motor.
2. The Licensee has not specifically identified a valid test report to substantiate qualification.
3. The Westinghouse specification (Reference 12) established the motor insulation to be class "B".
4. Reference 87 states that Limitorque Report B $\phi\phi\phi$ 3 is applicable to this equipment item for radiation only.
5. In Reference 659, Limitorque Report B $\phi\phi\phi$ <sup>58</sup> describes its generic qualification this way:

4.1.4 Generic Qualification

Generic qualification means qualifying a group (family) of actuators by subjecting a valve actuator representative of the family to the aging and environmental criteria indicated in this report. The qualification of the Limitorque Size SMB-0, as reported in the documentation of each of the four tests, was used to generically qualify all sizes of Limitorque operators for the environmental test conditions in accordance with IEEE 382-1972. The Size SMB-0 actuators is an average mid-size unit, and all other sizes of the type SMB, SB, SBD, and SMB/HBC are also deemed qualified. All sizes are constructed of the same materials with components designed to equivalent stress levels, same clearances and tolerances with the only difference being in physical size which varies corresponding to the differences in unit rating.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 13

NOTES:

6. Reference 662 (LIMITORQUE Report B0003) has been reviewed and has been found to be acceptable for outside containment applications. (on replacement schedule)

7. A qualified life estimate<sup>1</sup> has not been calculated, either in the documentation or by an independent means. It is necessary to establish a qualified life estimate by adequately evaluating age-related degradation because any aging analysis must be based on a time dependent parameter. Therefore, a qualified life estimate must be established in order to effectively implement a surveillance/maintenance program to identify age-related degradation. With the information given in Reference 1417 and information obtained from Peerless about their insulation it should be possible to determine a qualified life estimate via the Arrhenius technique described in Reference 1417.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

Equipment Item No. 14  
 Motorized Valve Actuators Located in Auxiliary Building (Area #2)  
 Limatorque Model SMB-00 with Reliance Electric Co. Motor  
 Actuates Valves in Lines Between RWST and SI Pumps Valve (MOV-825A, B)  
 Licensee Reference 12, 87, and 662  
 Required Operating Time: Short term (before sump recirculation)  
 TER Checksheet No. 14  
 Reference 59, Section 4.3.3.5  
 Licensee Submittal: Page 7 [62]; Table 3, Page 3 [1]; FRC SCEW 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:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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                      | <u>II.c</u> 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. 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) 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 \_\_\_\_\_

This equipment item was previously evaluated in Reference 59. See page 1A  
 Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

LICENSEE RESPONSE TO NRC SER

Item 4.3.3.5 addresses the MVA's actuating MOV's 825A and 825B. Inclusion of these valves in the maintenance/surveillance program described in Reference 72 should relieve the concerns relative to aging.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

NOTES:

1. Licensee has identified this equipment item as SMB-00 with a Reliance Electric Co. Motor.
2. The Licensee has not specifically identified a valid test report to substantiate qualification.
3. The WESTINGHOUSE specification identified as reference 12 establishes the motor insulation to be class 'B'.
4. Reference 87 states that LIMITORQUE REPORT B0003 is applicable to this equipment item for radiation only.
5. In Reference 6~~01~~<sup>59</sup>, LIMITORQUE REPORT B0058, describes its generic qualification this way:

— 4.1.4 Generic Qualification —

— Generic qualification means qualifying a group (family) of actuators by —  
— subjecting a valve actuator representative of the family to the aging —  
— and environmental criteria indicated in this report. The qualification —  
— of the Limitorque Size SMB-0, as reported in the documentation of each —  
— of the four tests, was used to generically qualify all sizes of —  
— Limitorque operators for the environmental test conditions in accordance —  
— with IEEE 382-1972. The Size SMB-0 actuators is an average mid-size —  
— unit, and all other sizes of the type SMB, SB, SB0, and SMB/HBC are —  
— also deemed qualified. All sizes are constructed of the same materials —  
— with components designed to equivalent stress levels, same clearances —  
— and tolerances with the only difference being in physical size which —  
— varies corresponding to the differences in unit rating. —



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

NOTES:

6. Reference 662 (Timitorgue Report B0003) has been reviewed and has been found to be acceptable for outside containment applications
7. The Licensee has previously stated, "These valves perform their safety function (Open to allow RWST fluid to the suction of the SI pumps) prior to the time an adverse environment would exist in the auxiliary building due to sump recirculation. No harsh environmental qualification is required for these items.
8. A qualified life estimate has not been calculated, either in the documentation or by an independent means. It is necessary to establish a qualified life estimate by adequately evaluating age-related degradation because any aging analysis must be based on a time dependent parameter. Therefore, a qualified life estimate must be established in order to effectively implement a surveillance/maintenance program to identify age-related degradation. With the information given in References



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 14

NOTES:

*662 and 1417 it is possible to determine  
such a value via use of The Arrhenius  
technique described in Reference 1417.*



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

Equipment Item No. 15  
 Motorized Valve Actuators Located in Intermediate Building (Area #3)  
 Limitorque Model SMB-00 with Reliance Electric Co. Motor  
 Actuators AFW Discharge Valves (MOV-4007, 4008); AFW Suction Valves  
 (MOV-4027, 4028); and AFW Cross-Connect Valves (MOV-4000A, B)  
 Licensee reference not cited  
 Required Operating Time: Short term.  
 TER Checksheet No. 15  
 Reference 59, Section 4.3.3.1  
 Licensee Submittal: Page 5 [62]; Table 3, Page 3 [1]; FRC SCEW 14, 15, 16

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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                   | <u>III.a</u> 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. 15

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

- I.a Equipment Qualified \_\_\_\_\_
- 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 Evaluation Deferred \_\_\_\_\_
- IV Documentation Not Made Available \_\_\_\_\_





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

LICENSEE RESPONSE TO NRC SER

"In Section 4.3.3.1, it is stated that 'a thorough review of the AFW system(s) at this plant (see Item E.1 in Appendix E) has led to the conclusion that the present configuration, with remote-manual initiation of the standby AFW system, is not satisfactory.' RG&E must dispute this conclusion. In fact, the NRC has reviewed and approved the present configuration of the AFW system. In the NRC's 'SEP Review of Safe Shutdown Systems for the R. E. Ginna Nuclear Power Plant,' it was determined that:

'The AFS and SAFS conform to GDC 19, "Control Room," GDC 44, "Cooling Water," GDC 45, "Inspection of Cooling Water Systems," GDC 46, "Testing of Cooling Water Systems," and Regulatory Guide 1.62, "Manual Initiation of Protective Actions." GDC 5, "Sharing of Structures, Systems and Components," is not applicable.'

"Further, the NRC reviewed the RG&E arrangement during the review of SEP Topic III-5.B, 'Pipe Break Outside Containment.' In Table 1 of the assessment, it is noted that the Intermediate Building elevation 253', where the pumps are located, is adequately protected from pipe break effects because '. . . there exists another system (SAFS) to supply auxiliary feed to the steam generators . . . .'

"Finally, the NRC has reviewed the RG&E accident analyses during the 'Design Basis Event' topic assessments, transmitted by letter of June 29, 1981. The limiting case of a Feedwater Line Break was evaluated as SEP Topic XV-6. In that assessment, acceptability of the Ginna system was based, in part, on approval of a feedline break analysis which took no credit for the Auxiliary Feedwater System, but only remote-manual actuation of the Standby Auxiliary Feedwater System in 10 minutes.

"Based on these numerous reviews and approvals by the NRC of our present AFW system configuration, the TER conclusion that our present system is unacceptable should be withdrawn."



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

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

- 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)

- 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**

Reason for Concurrence

- The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)
- Other (see page     )
- Resultant NRC Qualification Evaluation Category (IIIa/IIIb)
- Note 1: The Licensee (~~has~~ has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page     )

Reason for Non-Concurrence

- Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.
- Backup (equipment/system) is not safety-related.
- This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.
- 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

Evaluation From TER-C5257-178

"The AFW system at Ginna consists of a main AFW system and a standby AFW system. The main AFW system consists of three pumps (two motor-driven, each 200 gpm, and one turbine-drive, 400 gpm). Normally, each motor-driven pump supplies one steam generator but, with operator action, either motor-driven pump can provide feedwater to both steam generators. The turbine-driven pump normally provides feedwater to both steam generators. Flow from one motor-driven pump to one steam generator is sufficient to cool the plant to the temperature at which the RHR system can be used to bring the plant to a cold shutdown condition. A steam generator will boil dry in approximately 30 minutes without any feedwater flow and a reactor trip.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

SYSTEM CONSIDERATION REVIEW

EVALUATION OF LICENSEE STATEMENT (Continued)

"All three of the main AFW pumps are located in the same room and could be rendered inoperable as a result of HELB. The standby AFW system was added to provide independent AFW capability following such an event. The standby AFW system is in a separate plant area from the main AFW system. The standby AFW system consists of two motor-driven pumps. Each motor pump has a capacity of 200 gpm and supplies one steam generator. The pumps are in the same room but are separated by a partial wall. The standby AFW system functions independently of the main AFW system. The main AFW pumps are interlocked with the standby AFW system so that both are not simultaneously loaded onto their respective vital AC buses to prevent overloading the vital buses on loss of offsite power.

"In recommendation 2.1.7 of NUREG-0578, TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations, the task force recommended automatic initiation of all AFW systems. In NUREG-0611, Generic Evaluation of Feedwater Transients and Small Break Loss-of-Coolant Accidents in Westinghouse-Designed Operating Plants, the NRC staff further recommended that RG&E upgrade the AFW system automatic initiation signals and circuits to meet safety-grade requirements. RG&E responded to the recommendations of NUREG-0611 stating that the AFW pumps at Ginna were automatically initiated and that these circuits met safety-grade requirements. However, the pumps which are automatically initiated are the main AFW pumps which are capable of being rendered inoperable by a single HELB. In addition, the following characteristics of the AFW systems are germane to this problem:

- o The primary source of water for the main AFW system is from two 30,000-gallon non-seismic Category I condensate storage tanks. The backup sources are the condenser hotwell and a non-seismic Category I 100,000-gallon condensate storage tank which can be connected. The pump, which transfers water from the hotwell or the 100,000-gallon tank to the 30,000-gallon tanks, is powered from a non-safety grade supply.
- o Connection to the backup source requires operator action, which is estimated to take approximately 15 minutes.
- o The main AFW system also has a secondary seismic Category I water source; namely, the service water system (SWS) which draws water from Lake Ontario. It is estimated to take approximately 5 minutes to connect this source.
- o The switchgear to disconnect potentially faulted AFW pump motors from their respective vital buses are located in the auxiliary building (away from the harsh environment) and have sufficient physical separation to preclude a common-mode failure of the independent power



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

SYSTEM CONSIDERATION REVIEW

EVALUATION OF LICENSEE STATEMENT (Continued)

trains. The Licensee has verified that the fuse-and-breaker scheme for this equipment will prevent electrical faults from being reflected onto the vital buses.

- o The primary source of water to the standby AFW system is the SWS.

"The NRC staff is currently reviewing Licensee responses to NUREG-0611 as part of the AFW system reliability improvements stemming from the experiences at TMI-2. The results of this review may affect certain design features and/or environmental qualification requirements of the AFW system at Ginna. For the purposes of this report, the FRC conclusions presented below are based upon the current status of the system."

Conclusion From TER-C5257-178

"In view of the above discussion, FRC considers that the capability to manually initiate the standby AFW system does not provide sufficient justification for the position that environmental qualification of the main AFW pump motors and motor-operated valves is not necessary. Nonqualification could be justified if the standby AFW system met current standards for AFW system reliability (e.g., standby AFW pumps automatically initiated with a reliable source of feedwater; main AFW pumps placed in the backup role). At the same time, it should be noted that, in view of the developing requirements with regard to AFW system performance, FRC does not find technical deficiencies with the Licensee's position in that reasonable backup AFW capability has been provided at Ginna while these issues are being reviewed."



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

SYSTEM CONSIDERATION REVIEW

EVALUATION OF LICENSEE STATEMENT (Continued)

Evaluation

original concern with the reliability of the AFW/standby AFW system at Ginna was based on the consideration that the safety-grade, automatically initiated system (main AFW system) is not environmentally qualified, while the environmentally qualified system (standby AFW system) is not automatically initiated. RG&E's reply, which cites previous review and approval of the AFW configuration by the NRC, does not specifically address this concern nor is it obvious that previous NRC reviews would necessarily have focused on environmental qualification considerations.

In any HELB other than a break in the AFW turbine pump steam supply line in the AFW pump room, the main AFW system is capable of automatically initiating and performing the required AFW function. In case of a HELB within the AFW pump room, the motor-driven pumps will also be automatically started (the turbine-driven pump is inoperative because of no steam supply). At some time after automatic startup, however, one or both of the motor pumps will likely fail because of the hostile steam environment. At this point, the standby AFW pumps would have to be manually started in order to continue AFW flow to the steam generators. The Licensee has indicated that NRC approval of the AFW configuration at Ginna has been predicated on a capability of remote-manual actuation of the standby AFW system in 10 minutes.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 15

SYSTEM CONSIDERATION REVIEW

EVALUATION OF LICENSEE STATEMENT (Continued)

In summary, the following factors are significant in resolving this issue:

- o Auxiliary feedwater will be automatically initiated and feedwater will be initially supplied to the steam generators by the main AFW motor-driven pumps at the start of an accident, when the decay heat rate is highest, regardless of the type or location of an HELB.
- o The HELB which may cause subsequent failure of the main AFW pumps (break of the AFW pump turbine line in the AFW pump room), is a less severe break than a main steam line break (MSLB) or feedwater line break (FWLB), which therefore allows additional time for operator action to start the standby system. A 10-minute remote-manual start of the standby system has been found to be sufficient by the NRC to mitigate a FWLB.
- o The main AFW pumps will not be rendered inoperable instantaneously by a HELB in the main AFW pump room, which should allow for an orderly shift-over to the standby pumps.
- o Assuming both main AFW pumps have started, it is unlikely that their failure will be simultaneous. Shift-over to the standby pumps should be possible without losing continuity of AFW flow.

Considering the information developed by FRC's previous review of these systems, the additional information provided by the Licensee, and the above discussion, <sup>IT IS</sup> concluded that sufficient justification has been provided to support the Licensee's position that the standby AFW system provides an acceptable alternative to qualification of main AFW equipment which is subjected to the environment of the HELB in the AFW turbine steam supply line. FRC believes that the justifiable concerns expressed in TER-C5257-178 have been adequately resolved.

Conclusion

The AFW configuration at the Ginna plant will satisfactorily perform required AFW functions without documented environmental qualification of the main AFW equipment, which is subjected to the environment of a HELB in the AFW turbine steam supply line.



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NRC Contract No. NRC-03-79-118  
 FRC Project No. C5257  
 FRC Assignment No. 13  
 FRC Task No. 454

Page  
 1a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

Equipment Item No. 16  
 Motorized Valve Actuators Located in Auxiliary Building (Area #2)  
 Limitorque Model SMB-00 with Reliance Electric Co. Motor  
 Actuates Sump Valves (MOV-850A, B); RHR to SI Valves (MOV-857A, B, C); RWST to  
 RHR Valves (MOV-856); and CS Valves (MOV-860A, B, C, D and MOV-704A, B)  
 Licensee References 637, 639, 659, 662, and 87  
 Required Operating Time: Long term  
 TER Checksheet No. 16  
 Reference 59, Section 4.3.1.4  
 Licensee Submittal: Page 5 [62]; Table 3, Page 3 [1]; FRC SCEW 17, 18, 19, 20

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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





**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16**

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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                      | <u>II.c</u> 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. 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)	<u>X</u>
Program Established to Identify Aging Degradation	_____
Criteria Regarding Aging Simulation Satisfied (If Required)	_____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	_____
o Peak Pressure Adequate	_____
o Duration Adequate	_____
o Required Profile Enveloped Adequately	_____
o Steam Exposure (If Required) Adequate	_____
Criteria Regarding Spray Satisfied	_____
Criteria Regarding Submergence Satisfied	_____
Criteria Regarding Radiation Satisfied	_____
Criteria Regarding Test Sequence Satisfied	_____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	_____
Criteria Regarding Functional Testing Satisfied	_____
Criteria Regarding Instrument Accuracy Satisfied	_____
Test Duration Margin (1 hour + Function Time) Satisfied	_____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	_____

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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

See notes section: Pages 5f, 5g

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

LICENSEE RESPONSE TO NRC SER

4.3.1.4 - Various motorized valve actuators (Note: the MVA's for MOV's 704A and 704B should be added to this list). It is not clear why the TER requests that RG&E determine a "qualified life," since the DOR Guidelines specifically state that a qualified life need not be determined for all electrical equipment. Aging degradation was assessed in the Limitorque test report B0003 (200 hours at 165°F). Finally these MVA's will be considered in the maintenance/surveillance program noted in Reference 72.

motorized valve actuators for 704 A, B - These MVA's will see a harsh radiation environment during post-LOCA sump recirculation. Their qualification is addressed in RG&E's Reference 53; however, they were not specifically identified in our October 31, 1980 submittal. These MVA's will be added to item 8E of Table 3 of that submittal.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

NOTES:

1. The Licensee has identified This equipment item as SMB-00 with a Reliance Electric Co. motor

2. The Licensee has not specifically identified a valid test report to substantiate qualification for This equipment item. <sup>However</sup> see note 4

3. Reference 87 states that Limitorque Report B0003 is applicable to This equipment item for radiation only.

4. In Reference 659, Limitorque Report B0058, describes its generic qualification This way:

4.1.4 Generic Qualification

Generic qualification means qualifying a group (family) of actuators by subjecting a valve actuator representative of the family to the aging and environmental criteria indicated in this report. The qualification of the Limitorque Size SMB-0, as reported in the documentation of each of the four tests, was used to generically qualify all sizes of Limitorque operators for the environmental test conditions in accordance with IEEE 382-1972. The Size SMB-0 actuators is an average mid-size unit, and all other sizes of the type SMB, SB, SBD, and SMB/HBC are also deemed qualified. All sizes are constructed of the same materials with components designed to equivalent stress levels, same clearances and tolerances with the only difference being in physical size which varies corresponding to the differences in unit rating.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 16

NOTES:

6. Reference 662 (Limitique BΦΦ3) has been re-viewed and has been found to be acceptable for outside containment applications.

7. The Licensee has implemented a surveillance/maintenance program to identify age-related failures

8. A qualified <sup>life</sup> estimate has not been calculated, either in the documentation or by an independent means. It is necessary to establish a qualified life estimate to adequately evaluate age-related degradation because any aging analysis must be based on a time dependent parameter. Therefore, a qualified life estimate must be established in order to effectively implement a surveillance/maintenance program to identify age-related degradation. With the information given in References 662 and 1417 it is possible to determine such a value via use of the Arrhenius technique described in Reference 1417.



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17**

Equipment Item No. 17  
 Motorized Valve Actuators Located Inside Containment (Area #1)  
 Limitorque Model SMB-00 with Peerless Motor  
 Actuates Valves for PWR Suction from Sump B (MOV-851A, B); SI Valves to Cold  
 Legs (MOV-878B, D); SI Valves to Hot Legs (MOV-878A, C)  
 Licensee Reference 12  
 Required Operating Time: Not required to operate  
 TER Checksheet No. 17  
 Reference 59, Section 4.4.2  
 Licensee Submittal: Page 7 [62]; Table 3, Pages 3 and 4 [1];  
 FRC SCEW 21, 22, 72

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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System Consideration Review	4a, 4b, 4c, 4d, <del>4e</del> , <del>4f</del>
Equipment Environmental Qualification Review	5a, <del>5b</del> , <del>5c</del> , <del>5d</del> , <del>5e</del> , <del>5f</del> , 5g, <del>5h</del> , <del>5i</del> , <del>5j</del>
Installed TMI Lessons Learned Implementation Equipment Summary	<del>6a</del> , <del>6b</del>
Maintenance and Replacement Schedule Summary	<del>7a</del> , <del>7b</del> , <del>7c</del>



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17**

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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                   | <u>III.a</u> Exempt Conditional - see page 5g. |
| 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 \_\_\_\_\_
- 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 \_\_\_\_\_

Note: This category is conditional based on the resolution of the discussion on page 5g.





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NRC Contract No. NRC-03-79-118

FRC Project No. C5257

FRC Assignment No. 13

FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

LICENSEE RESPONSE TO NRC SER

"In 4.1.1, it is noted that certain other items should be added to the list of safety-related electrical equipment requiring environmental qualification. These are discussed below:

"Actuators for valves in the hot leg injection paths (878A, 878C). A discussion of these valves was inadvertently omitted. These should have been discussed together with item 8G of the October 31, 1980 submittal (878B, 878D). The 878A and 878C valves are locked in position (closed) with power removed. No credit is taken for hot leg Safety Injection flow in the Ginna Safety Analysis. These valves should thus be classified in NRC Category III, equipment that is exempt from qualification."



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

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.

X 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)

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

Reason for Non-Concurrence

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

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

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

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

\_\_\_ Other (see page\_\_\_)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

In evaluating Equipment Item 8G (Valves 878B and 878D, cold leg injection valves) in TER-C5257-178, FRC determined that these valves should be placed in NRC Category III because they were locked in their safety position (open) with power removed. However, valves 878A and 878C, the hot leg injection valves, are locked closed.

The Ginna Final Safety Analysis Report (FSAR), Section 6.2.2, states that the safety injection pumps deliver water through four connections, one in each hot leg and one in each cold leg of the RCS. Furthermore, Section 14.3, discussing small break LOCAs states:



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

SYSTEM CONSIDERATION REVIEW

EVALUATION OF LICENSEE STATEMENT (Continued)

\*RESULTS - SMALL BREAKS

"The preceding paragraphs have demonstrated the adequacy of the accumulators to terminate core exposure and limit the temperature rise of the core for large area ruptures. For smaller breaks the discharge of fluid through the hole is less severe and for small enough breaks the high head safety injection pump is capable of maintaining flooding of the core hot spot for the entire blowdown.

"Three combinations of high head safety injection equipment operation were considered:

1. Full system; three pumps delivering through the four injection lines.
2. Single failure; two pumps delivering through three lines, one injection line isolation valve failed to open.
3. Single failure and broken safety injection line; one pump delivering to intact header and second pump delivering to second header with one line broken.

"(This is a special case where the loss of coolant is caused by a break in the safety injection line between the reactor coolant pipe and the check valve in the injection line. In this case not only is the flow lost through the one line, but the effective cut-in pressure for delivery is reduced until the pressure loss due to flow in the spilling line equals the Reactor Coolant back pressure. Since the injection lines are only 2 inches in diameter, this case applies for break sizes 2 inches and smaller.)"

It is apparent that the FSAR assumes availability of the hot leg injection points. In fact, it appears that with both hot leg injection valves disabled closed ~~and~~, a broken cold leg injection line, the system is reduced from three pumps discharging to four lines to one pump discharging to one line (the other two pumps pumping out the break). At this point, a single active failure to the appropriate pump and all safety injection flow would be interrupted until certain motor operated valves (such as MOV-871A and 871R) can be realigned to redirect the discharge of one of the operable pumps from the broken cold leg line to the intact line.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

SYSTEM CONSIDERATION REVIEW

EVALUATION OF LICENSEE STATEMENT (Continued)

Consequently, it is not apparent why valves 878A and 878C are locked closed. It is possible that modifications have been made to the plant since the FSAR was written which changes the situation. Nevertheless, from the documentation available, it does not appear that valves 878A and 878C should be disabled closed.

Conclusion

Valves 878A and 878C should be qualified for the post-accident environment in order to retain post-accident operability.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 17

NOTES:

The Licensee states that the 8784dc valves have been locked closed and power has been removed from the valves. The Licensee states that the motor operators are exempt from qualification.

With power physically and permanently removed from the valve operators, the units would no longer be considered "electrical equipment" within the meaning of the DOD Guidelines. Accordingly, from a qualification standpoint, the valves would be considered exempt.

However, based on the discussion contained on pages 4b, 4c and 4d, qualification would be required if the valves are required to be operable.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

Equipment Item No. 18  
 Motorized Valve Actuators Located Inside Containment (Area #1)  
 Limitorque Model SMB-1 with Reliance Electric Co. Motor  
 Actuates Core Deluge Valves (MOV-852A, B)  
 Licensee References 26, 637, and 639  
 Required Operating Time: 3I signal  
 TER Checksheet No. 18  
 Reference 59, Section 4.3.3.2  
 Licensee Submittal: Page 6 [62]; Table 3, Page 4 [1]; FRC SCEW 23

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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                      | <u>II.c</u> 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	_____
Adequate Similarity Between Equipment and Test Specimen Established	_____
Aging Degradation Evaluated Adequately	_____
Qualified Life or Replacement Schedule Established (If Required)	<u>X</u>
Program Established to Identify Aging Degradation	_____
Criteria Regarding Aging Simulation Satisfied (If Required)	_____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	_____
o Peak Pressure Adequate	_____
o Duration Adequate	_____
o Required Profile Enveloped Adequately	_____
o Steam Exposure (If Required) Adequate	_____
Criteria Regarding Spray Satisfied	_____
Criteria Regarding Submergence Satisfied	_____
Criteria Regarding Radiation Satisfied	_____
Criteria Regarding Test Sequence Satisfied	_____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	_____
Criteria Regarding Functional Testing Satisfied	_____
Criteria Regarding Instrument Accuracy Satisfied	_____
Test Duration Margin (1 hour + Function Time) Satisfied	_____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	_____

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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NRC Contract No. NRC-03-79-118  
FRC Project No. C5257  
FRC Assignment No. 13  
FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

LICENSEE RESPONSE TO NRC SER

Item 4.3.3.2 addresses MVA's for motor operated valves 852A and 852B. Contrary to the FRC conclusion, a qualified life does not need to be established, in accordance with the DOR Guidelines. However, Reference 72 concerning maintenance/surveillance does apply to these items.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

NOTES:

1. The Licensee has identified This equipment item as SMB- $\phi\phi$  with a Reliance Electric Co. motor
2. The Licensee has not specifically identified a valid test report to substantiate qualification for This equipment item (<sup>How</sup> see note 4)
3. Reference 87 states that Limitorque Report B $\phi\phi$ 3 is applicable to This equipment item for radiation only.
4. In Reference 659, Limitorque Report B $\phi\phi$ 58, describes its generic qualification This way:

4.1.4 Generic Qualification

Generic qualification means qualifying a group (family) of actuators by subjecting a valve actuator representative of the family to the aging and environmental criteria indicated in this report. The qualification of the Limitorque Size SMB-0, as reported in the documentation of each of the four tests, was used to generically qualify all sizes of Limitorque operators for the environmental test conditions in accordance with IEEE 382-1972. The Size SMB-0 actuators is an average mid-size unit, and all other sizes of the type SMB, SB, SBD, and SMB/HBC are also deemed qualified. All sizes are constructed of the same materials with components designed to equivalent stress levels, same clearances and tolerances with the only difference being in physical size which varies corresponding to the differences in unit rating.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 18

NOTES:

6. Reference 662 (Limitique BΦΦ3) has been reviewed and has been found to be acceptable for outside containment applications.

7. The Licensee has implemented a surveillance/maintenance program to identify age-related failures.

8. A qualified <sup>life</sup> estimate has not been calculated, either in the documentation or by an independent means. It is necessary to establish a qualified life estimate. Inadequately evaluating age-related degradation because any aging analysis must be based on a time dependent parameter. Therefore, a qualified life estimate must be established in order to effectively implement a surveillance/maintenance program to identify age-related degradation. With the information given in References 662 and 1417 it is possible to determine such a value via use of the Arrhenius technique described in Reference 1417.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19

Equipment Item No. 19  
 Motorized Valve Actuators Located in Auxiliary Building Addition (Area #6)  
 Limitorque Model SMB-00 with Reliance Electric Co. Motor  
 Actuates Standby AFW Valves (MOV-9703A, B; 9704A, B; 9710A, B)  
 Licensee References 30, 27, and 33  
 Required Operating Time: Long term  
 TER Checksheet No. 19  
 Reference 59, Section 4.7.2  
 Licensee Submittal: Table 3, Page 4 [1]; FRC SCEW 24, 25, 26

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

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

Not stated, Not applicable  
Deferred

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 19**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
  - Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
  - Corrective action specified by the Licensee:
    - Equipment replacement with qualified equipment
    - Equipment modification
    - Equipment relocation above submergence level
    - Relocate or shield equipment from radiation source
    - Verify qualification by additional (testing/analysis)
    - Equipment relocation to a mild environment
    - Qualification testing of equipment in progress
    - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                    |                                |
|------------------------------------|--------------------------------|
| I.a Qualified                      | II.c Qualified Life Deficiency |
| I.b Modification                   | III.a Exempt                   |
| II.a Qualification Not Established | <b>III.b</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 \_\_\_\_\_
- 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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

Equipment Item No. 20  
 Motors Located in Auxiliary Building Addition (Area #6)  
 General Electric Type K, 250 hp  
 Drive Standby Auxiliary Feedwater Pumps (Plant ID Not Stated)  
 Licensee References 30 and 27  
 Required Operating Time: Long term  
 TER Checksheet No. 20  
 Reference 59, Section 4.7.6  
 Licensee Submittal: Table 3, Page 4 [1]; FRC SCEW 27

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

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

Not stated, Not applicable  
Deferred

LISTING OF APPLICABLE CHECKSHEETS:

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





**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
  - Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
  - Corrective action specified by the Licensee:
    - Equipment replacement with qualified equipment
    - Equipment modification
    - Equipment relocation above submergence level
    - Relocate or shield equipment from radiation source
    - Verify qualification by additional (testing/analysis)
    - Equipment relocation to a mild environment
    - Qualification testing of equipment in progress
    - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 20

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

- I.a Equipment Qualified \_\_\_\_\_
- 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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

Equipment Item No. 21  
 Motors Located in Auxiliary Building (Area #2)  
 Westinghouse 444 TS TBDP 200 hp  
 Containment Spray Pump Motors (Plant ID Not Stated)  
 Licensee References 604 and 605  
 Required Operating Time: Long term  
 TER Checksheet No. 21  
 Reference 59, Section 4.7.7  
 Licensee Submittal: Page 14 [62]; Table 3, Page 4 [1]; FRC SCEW 29

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, KPS, None,  
 Not stated, Not applicable - deferred

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 | <u>III.b</u> Not in Scope note #1 |
| II.b Not Qualified                 | 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 \_\_\_\_\_
- 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

see page 5f



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

LICENSEE RESPONSE TO NRC SER

In item 4.7.7, various Westinghouse pumps motors are addressed. The Containment Spray, RHR, and Safety Injection pump motors could see a high radiation environment during the mitigation of a LOCA. This is a "harsh" environment; qualification of these pump motors should be reviewed for this parameter.

The other motors use PMR Class B insulation. As stated in Reference 2.69, these motors are qualified for  $1 \times 10^7$  rads and an operating-life of 20 years. Since these motors see only intermittent service, an operational capability of 40 years is provided. These pump motors are also included in the maintenance/ surveillance program of Reference 72. We are not able to make this entire proprietary report available at this time. Salient facts have been transmitted in Reference 2.69; the report itself is available for audit at RG&E.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 21

NOTES:

Note 2: This equipment is in a nonharsh environment. Accident plus aging radiation doses (at 100 mR/hr and 9000 rad accident) are less than  $10^4$  rad (40yr). In addition the materials that are susceptible to radiation related degradation are primarily affected by  $\beta$  radiation. The metal and splice materials in question are sufficiently shielded from recirculating fluids that this need not be considered.



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 FRC Assignment No. 13  
 FRC Task No. 454

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**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22**

Equipment Item No. 22  
 Motors Located in Auxiliary Building (Area #2)  
 Westinghouse 444 TS TBDP 150 hp  
 Component Cooling Water Pump Motors (Plant ID Not Stated)  
 Licensee References 604 and 605  
 Required Operating Time: Long term  
 TER Checksheet No. 22  
 Reference 59, Section 4.7.7  
 Licensee Submittal: Page 14 [62]; Table 3, Page 4 [1]; FRC SCEW 28

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,  
 Not stated, Not applicable-deferred

LISTING OF APPLICABLE CHECKSHEETS:

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





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 | <u>III.b</u> Not in Scope <i>Note 1</i> |
| II.b Not Qualified                 | IV Documentation Not Available          |



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

- I.a Equipment Qualified \_\_\_\_\_
- 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 \_\_\_\_\_

MILD ENVIRONMENT

See page 5f



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

LICENSEE RESPONSE TO NRC SER

In item 4.7.7, various Westinghouse pumps motors are addressed. The Containment Spray, RHR, and Safety Injection pump motors could see a high radiation environment during the mitigation of a LOCA. This is a "harsh" environment; qualification of these pump motors should be reviewed for this parameter.

The other motors use PMR Class B insulation. As stated in Reference 2.69, these motors are qualified for  $1 \times 10^7$  rads and an operating-life of 20 years. Since these motors see only intermittent service, an operational capability of 40 years is provided. These pump motors are also included in the maintenance/ surveillance program of Reference 72. We are not able to make this entire proprietary report available at this time. Salient facts have been transmitted in Reference 2.69; the report itself is available for audit at RG&E.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 22

NOTES:

Note 1: This equipment is in a nonharsh environment. Accident plus aging radiation doses (at 100 mR/hr and 9000 accident) are less than  $10^4$  rad (40yr). In addition the materials that are susceptible to radiation related degradation are primarily affected by  $\beta$  radiation. The motor and splice materials in question are sufficiently shielded from recirculating fluids that this need not be considered.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

Equipment Item No. 23  
 Motors Located in Auxiliary Building (Area #2)  
 Westinghouse 445 TS TBDP 200 hp  
 RHR Pump Motors (Plant ID Not Stated)  
 Licensee References 42, 604, and 605  
 Required Operating Time: Long term  
 TER Checksheet No. 23  
 Reference 59, Section 4.7.7  
 Licensee Submittal: Page 14 [62]; Table 3, Page 4 [1]; FRC SCEW 30

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 | <u>III.b</u> Not in Scope note 1 |
| 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 \_\_\_\_\_
- 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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

LICENSEE RESPONSE TO NRC SER

In item 4.7.7, various Westinghouse pumps motors are addressed. The Containment Spray, RHR, and Safety Injection pump motors could see a high radiation environment during the mitigation of a LOCA. This is a "harsh" environment; qualification of these pump motors should be reviewed for this parameter.

The other motors use PMR Class B insulation. As stated in Reference 2.69, these motors are qualified for  $1 \times 10^7$  rads and an operating-life of 20 years. Since these motors see only intermittent service, an operational capability of 40 years is provided. These pump motors are also included in the maintenance/ surveillance program of Reference 72. We are not able to make this entire proprietary report available at this time. Salient facts have been transmitted in Reference 2.69; the report itself is available for audit at RG&E.





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 23

NOTES:

Note 1: This equipment is in a nonharsh environment. Accident plus aging radiation doses (at 100 mR/hr and 9000 rad/accident) are less than  $10^4$  rad (40yr). In addition the materials that are susceptible to radiation related degradation are primarily affected by  $\beta$  radiation. The motor and splice materials in question are sufficiently shielded from recirculating fluids that this need not be considered.



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24**

Equipment Item No. 24  
 Motors Located on Basement Level of Intermediate Building  
 Westinghouse Type 505US ABDP, 250 hp  
 Drive Auxiliary Feedwater Pumps (Plant ID Not Stated)  
 Licensee References 42 and 604  
 Required Operating Time: Long term  
 TER Checksheet No. 24  
 Reference 59, Section 4.6.2  
 Licensee Submittal: Table 3, Page 5 [1]; FRC SCEW 31

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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                   | <u>III.a</u> 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 \_\_\_\_\_
- 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 \_\_\_\_\_



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

LICENSEE RESPONSE TO NRC SER

Item 4.6.2 addresses the auxiliary feedwater pumps. As noted in item E.1 of Appendix E, FRC had concluded that the present configuration of the auxiliary feedwater system is not satisfactory. As noted earlier in this letter (#12), the NRC has consistently reviewed and approved this system.

RG&E also provided an evaluation to determine if the Class 1E AFW circuits could be degraded by an HELB in the intermediate building, thus negating the operability of the Standby AFW system. This was provided in a letter from John E. Maier, RG&E, to Dennis M. Crutchfield, NRC, dated December 15, 1980. This evaluation concluded that no degradation would occur.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 24

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

— 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.

— 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 not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

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)

— 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. 24

Reason for Concurrence

- \_\_\_ The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)
- \_\_\_ Other (see page\_\_\_)
- \_\_\_ Resultant NRC Qualification Evaluation Category (IIIa/IIIb)
- Note 1: The Licensee (~~has~~/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page 3A)

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

See *the* Evaluation of AFW System equipment provided on pages 4b through 4f of Equipment Item No. 15 to this report.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

Equipment Item No. 25  
 Motors Located in the Auxiliary Building (Area #3)  
 Westinghouse 509 US AFDP 350 hp  
 Safety Injection Pump Motors (Plant ID Not Stated)  
 Licensee References 42 and 604  
 Required Operating Time: Long term  
 TER Checksheet No. 25  
 Reference 59, Section 4.7.7  
 Licensee Submittal: Page 14 [62]; Table 3, Page 5 [1]; FRC SCEW 32

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 deferred

LISTING OF APPLICABLE CHECKSHEETS:

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





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 | <u>III.b</u> Not in Scope      |
| II.b Not Qualified                 | 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 \_\_\_\_\_
- III.b Equipment Not in the Scope of the Qualification Review X \_\_\_\_\_
- IV Documentation Not Made Available \_\_\_\_\_

MILD ENVIRONMENT



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

LICENSEE RESPONSE TO NRC SER

In item 4.7.7, various Westinghouse pumps motors are addressed. The Containment Spray, RHR, and Safety Injection pump motors could see a high radiation environment during the mitigation of a LOCA. This is a "harsh" environment; qualification of these pump motors should be reviewed for this parameter.

As properly pointed out by FRC, the Safety Injection pump motor is wound with Westinghouse Thermalastic Epoxy, and is qualified for a radiation environment by WCAP-8754. The effects of Mobilux lubricant on the bearing system will be evaluated, among other things, by inclusion in the maintenance/surveillance program of Reference 72.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 25

NOTES:

Note 1: This equipment is in a nonharsh environment. Accident plus aging radiation doses (at 100 r.R/hr and 9000 rad accident) are less than  $10^4$  rad (40yr). In addition the materials that are susceptible to radiation related degradation are primarily affected by  $\beta$  radiation. The motor and splice materials in question are sufficiently shielded from recirculating fluids that this need not be considered.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

Equipment Item No. 26  
 Motors Located in Screen House (Area #5)  
 Westinghouse 509 UPH ABDP, 300 hp  
 Drive Service Water Pumps (Plant ID Not Stated)  
 Licensee Reference 42  
 Required Operating Time: Long term  
 TER Checksheet No. 26  
 Reference 59, Section 4.7.8  
 Licensee Submittal: Table 3, Page 5 [1]; FRC SCEW 33

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 26

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

- Documented Evidence of Qualification Adequate \_\_\_\_\_
- 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 \_\_\_\_\_



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 FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

Equipment Item No. 27 (TMI Action Plan Item)  
 Motor Located Inside Containment (Area #1)  
 Westinghouse Model TEFC 2-hp, 3-phase, 60-Hz, 230/460-V  
 Drives Hydrogen Recombiner Blower (Plant ID Not Stated)  
 Licensee References 40, 585, 637, and 639  
 Required Operating Time: Long term  
 TER Checksheet No. 27  
 Reference 59, Section 4.7.3  
 Licensee Submittal: Page 14 [62]; Table 3, Page 11 [1]; FRC SCEW 65

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 deferred

LISTING OF APPLICABLE CHECKSHEETS:

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System Consideration Review	<del>4a</del> , <del>4b</del> , <del>4c</del> , <del>4d</del> , <del>4e</del> , <del>4f</del>
Equipment Environmental Qualification Review	5a, 5b, 5c, 5d, 5e, 5f, <del>5g</del> , <del>5h</del> , <del>5i</del> , <del>5j</del>
Installed TMI Lessons Learned Implementation Equipment Summary	6a, <del>6b</del>
Maintenance and Replacement Schedule Summary	7a, <del>7b</del> , <del>7c</del>





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other (IF motor to lead splice is unqualified the splices will be replaced with qualified Raychem Sleeves.)
- 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 during the Spring 1982 refueling outage.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                    |                                       |
|------------------------------------|---------------------------------------|
| I.a Qualified                      | <u>II.c</u> 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. 27

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

- Documented Evidence of Qualification Adequate \_\_\_\_\_
- Adequate Similarity Between Equipment and Test Specimen Established \_\_\_\_\_
- Aging Degradation Evaluated Adequately \_\_\_\_\_
- Qualified Life or Replacement Schedule Established (If Required) 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 \_\_\_\_\_



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

LICENSEE RESPONSE TO NRC SER

Items 4.7.3 and 4.7.18 address portions of the Hydrogen Recombiner unit. This is a "TMI-related" item; however, deferral of review is not necessary, since the unit is already installed. The FRC review directed that an overall life of the motor should be established, and that a review of the motor's bearing, splices, and lubrication system should be made. Based on the intermittent use of the recombiner, a 40-year life would be expected. However, period maintenance and surveillance, per Reference ~~72~~, will account for potential failures, including age-related causes. As for the lead-to-cable splice, Westinghouse has noted that the information in Reference 2.64 is applicable. At the next scheduled refueling shutdown of Spring 1982, RG&E will verify that the proper splice material was used. If not, the splices will be replaced with qualified Raychem sleeves.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

INSTALLED TMI LESSONS LEARNED IMPLEMENTATION EQUIPMENT SUMMARY

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

This plant is a PWR X, BWR     .

The NSSS Vendor is Westinghouse (W) X, Babcox & Wilcox (B&W)     ,  
 Combustion Engineering (CE)     , General Electric (GE)     .

With respect to this equipment item, it is noted (applicable section checked):

- The Licensee does not provide adequate information with respect to identification of TMI Action Plan equipment installed as of 1/1/81.
- The Licensee has not provided the correlation of this equipment item with the specific sections of NUREG-0737. [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and the terminal blocks associated with the device also identified?]
- The Licensee has not provided the approximate installation date for the TMI Action Plan equipment items so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation.
- The Licensee has provided a standard Owners' Group position with respect to a NUREG-0737 technical area.
- The Licensee has requested extensions of implementation dates.
- The Licensee has stated that this equipment item is associated with the following section of NUREG-0737. (This list of applicable NUREG-0737 sections has been identified by NRC as sections within the scope of this review):
  - II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment
  - II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position

X Required by NUREG-0578 section 2.1.5.C



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 27

MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

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

The motor to lead splices will be inspected. If the splices are found to be a type that is not qualified they will be replaced with qualified Raychem sleeves.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

Equipment Item No. 28  
 Motors Located in Auxiliary Building (Area #2)  
 U.S. Electrical Motors Model VEU, 100 hp Frame 84-445U, Class B Insulation  
 Drive Charging Pumps (Plant ID Not Stated)  
 Licensee reference not cited  
 Required Operating Time: Long term  
 TER Checksheet No. 28  
 Reference 59, Section 4.7.16  
 Licensee Submittal: Table 3, Page 11 [1]; FRC SCEW 66

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

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

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
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System Consideration Review	<del>4a</del> , <del>4b</del> , <del>4c</del> , <del>4d</del> , <del>4e</del> , <del>4f</del>
Equipment Environmental Qualification Review	<del>5a</del> , <del>5b</del> , <del>5c</del> , <del>5d</del> , <del>5e</del> , <del>5f</del> , <del>5g</del> , <del>5h</del> , <del>5i</del> , <del>5j</del>
Installed TMI Lessons Learned Implementation Equipment Summary	<del>6a</del> , <del>6b</del>
Maintenance and Replacement Schedule Summary	<del>7a</del> , <del>7b</del> , <del>7c</del>



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 28

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

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



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**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29**

Equipment Item No. 29  
 Motors Located in Auxiliary Building (Area #2)  
 Westinghouse Model SBDP, 2 hp, Class B Insulation  
 Drive Cooling Fans for RHR Pump Motors (Plant ID Not Stated)  
 Licensee Reference 605  
 Required Operating Time: Long term  
 TER Checksheet No. 29  
 Reference 59, Section 4.7.12  
 Licensee Submittal: Page 15 [62]; Table 3, Page 12 [1]; FRC SCEW 70

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,  
 Not stated, Not applicable deferred

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
 X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

LICENSEE RESPONSE TO NRC SER

Item 4.7.12 addresses cooling fan motors located in the auxiliary building. These motors are subject to a radiation environment during post-LOCA sump recirculation, and should thus be reviewed for qualification in the "harsh" environment. As stated in b) above, Reference 2.69 is applicable to these motors.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 29

MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

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

Bearings and grease will be replaced yearly  
as stated in maintenance procedure A-1011.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

Equipment Item No. 30  
 Motors Located in Auxiliary Building (Area #2)  
 Westinghouse Model SBDP, 3 hp, Class B Insulation  
 Drive Cooling Fans for CS Charging and SI Pump Motors (Plant ID Not Stated)  
 Licensee Reference 605  
 Required Operating Time: Long term  
 TER Checksheet No. 30  
 Reference 59, Section 4.7.12  
 Licensee Submittal: Page 15 [62]; Table 3, Page 12 [1]; FRC SCEW 69

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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





**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
  - Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
  - Corrective action specified by the Licensee:
    - Equipment replacement with qualified equipment
    - Equipment modification
    - Equipment relocation above submergence level
    - Relocate or shield equipment from radiation source
    - Verify qualification by additional (testing/analysis)
    - Equipment relocation to a mild environment
    - Qualification testing of equipment in progress
    - Other ( \_\_\_\_\_ )
  - The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
  - The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

LICENSEE RESPONSE TO NRC SER

Item 4.7.12 addresses cooling fan motors located in the auxiliary building. These motors are subject to a radiation environment during post-LOCA sump recirculation, and should thus be reviewed for qualification in the "harsh" environment. As stated in b) above, Reference 2.69 is applicable to these motors.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 30

MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

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

Bearings and grease will be replaced yearly per maintenance procedure A-1011.



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31**

Equipment Item No. 31  
 Electrical Penetrations Located Within and Outside Containment (Area #1)  
 Crouse-Hinds Co. (Various Conductor Configurations; Models Not Stated)  
 Provides Connection for Electrical Circuits  
 Licensee References 33, 37, 40, 537, and 749  
 Required Operating Time: Long term  
 TER Checksheet No. 31  
 Reference 59, Section 4.2.1.1  
 Licensee Submittal: Page 5 [62]; Table 3, Page 5 [1]; FRC SCEW 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:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and ~~will~~ will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| <input checked="" type="radio"/> I.a Qualified | II.c Qualified Life Deficiency |
| I.b Modification                               | III.a Exempt                   |
| II.a Qualification Not Established             | III.b Not in Scope             |
| II.b Not Qualified                             | IV Documentation Not Available |



**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 \_\_\_\_\_

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.





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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 31

LICENSEE RESPONSE TO NRC SER

In Section 4.2.1, the Crouse-Hinds electrical penetrations were classified as NRC Category I.a. No additional information is thus required.



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**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32**

Equipment Item No. 32  
 Electrical Penetration Located Both Within and Outside Containment (Area #1)  
 Westinghouse, Model Not Stated  
 Provides Connection for Electrical Circuits  
 Licensee References 38, 2098, 2099, 2100, 2101, 2102, 2103, 2104, and 2105  
 Required Operating Time: Long term  
 TER Checksheet No. 32  
 Reference 59, Section 4.6.3  
 Licensee Submittal: Page 11 [62]; Table 3, Page 5 [1]; FRC SCEW 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:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| <input checked="" type="radio"/> I.a Qualified | II.c Qualified Life Deficiency |
| I.b Modification                               | III.a Exempt                   |
| II.a Qualification Not Established             | III.b Not in Scope             |
| II.b Not Qualified                             | IV Documentation Not Available |



**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 \_\_\_\_\_ 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.d 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

Item 4.6.3 addresses the Westinghouse electrical penetration. New reference 2.61, included with this report, provides detailed comprehensive qualification data for post-accident qualification testing of the penetrations, as well as a detailed aging evaluation. Please note that even though PEN-TR-81-45 specifies only a 268°F peak temperature, with a radiation dose of  $1.5 \times 10^6$  rads, the actual testing was performed at 340°F, with an integrated dose of  $2 \times 10^6$  rads.

The question of short-circuit currents damaging these penetrations was discussed during a telephone conversation between RG&E personnel and Messrs. DiBenedetto and Lee of the NRC staff. At that time, we stated that only LVDT and television camera cables use this penetration. These are low voltage and current circuits, which could not damage the penetration even in the event of a short-circuit fault. An assessment of similarly-used penetrations (used as parts of instrumentation loops), is made in Section 3.4 of the "SEP Technical Evaluation, Topic VIII-4, Electrical Penetrations of Reactor Containment," transmitted by letter from Dennis M. Crutchfield to John E. Maier dated March 30, 1981. It was concluded that no mechanical failures would be expected for these penetrations.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW

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

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>EQUIPMENT DESCRIPTION</u>			
Equipment Type	Electrical Penetration	Electrical Penetration	
Manufacturer's Name (5.2.2/-/-)	Westinghouse	Westinghouse	
Model Number (5.2.2/-/-)	Not stated	WX 32714 For Ginna Plant	
Serial Number	Not stated	Nozzle No AE-12	
Features/Mounting (5.2.6/-/-)		Horizontal; Bolted Flange	
Connections/Interfaces (5.2.6/-/-)	COAX INST Cable with splice	COAX and inst. Cable with splice	
Location/Elevation	Not stated	Not stated.	
Equipment ID No.	NA	NA	
<u>QUALIFICATION REPORT</u> (8.0/5.0/5.0)			
Report ID Number	PEN-TR-81-45	PEN-TR-81-45	See note (1.)
Report Date	August 7, 1981	August 7, 1981	
Issued by	Westinghouse	Westinghouse	
Prepared for	Ginna Plant	Ginna Plant	
Referenced Reports	see note 1	see note 1	see note 1
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	Test and analysis	Test and analysis.	
<u>QUALIFICATION TEST PROGRAM</u>			
Functional Test Description (5.2.5/2.2.9/2.2.9)	Not stated	Insulation Resistance Leak test	
Operating Conditions (-/2.2.10/2.2.10)	Various		
Load/Cycles/Voltage/ Current/Freq.	Low Voltage	480 V/60 Hz	see note 3



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.)
Acceptance Criteria (5.2.5/2.2.1/2.2.1)	Not Stated	leakage $\leq 10^{-2}$ cc/h IR > 100 Megohm	
Accuracy (5.2.5/-/-)	Not Applicable	Not Applicable	
Number of Specimens	not stated	one (1)	
Test Instruments Calibrated	not applicable	yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Passive	not applicable	
Test Duration (5.2.1/-/-)	not stated	26 h. + 45 hours	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	~ 1 day	26 h.	
Required Function Time	LONG TERM	Not Applicable	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	Not stated		
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)	Not Applicable	① Functional ② steam 45 hours (230°-340°F/5-47psig) ③ Functional test ④ Thermal cycling ⑤ thermal aging ⑥ functional test ⑦ IRRADIATION ⑧ LOCA TEST	NUREG 0588 DMY Ginh 15 Covered BY DOR Guidelines
1. Representative Sample 2. Baseline Data 3. Performance Extremes 4. Thermal Aging 5. Radiation Aging 6. Wear Aging 7. Vibration/Seismic 8. DBE Exposure 9. Post-DBE Exposure 10. Inspection	↓		
Aging (5.2.4, 7.0/4.0/4.0) Thermal Aging/Basis	ARRHENIUS	ARRHENIUS + TEST OF PENETRATION END INDIVIDUAL MATERIALS.	
Material Aging Evaluation. (7.0/-/-)	Not Stated	Epoxy - (W) G-1 Silicone O Rings Epoxy Glass Laminates	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	Refer to Test Report	SILICONE VARNISH OKONITE/OKOPRENE Cable INSULATION	
Radiation Aging, Type			



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.)
Radiation Aging, Dose (rd)	< 10 <sup>6</sup> rd	Not stated	
Radiation Aging, Dose Rate	< 1 rd/h.	Not stated	
Radiation Aging, Method	Not stated	Included in Accident dose	
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	Not Stated	None Identified	
Operational Aging (-/4.2/-)	Not applicable	thermal cycling - 20°C to 135°C for five cycles.	
Other Age Conditioning (-/4.2/-)	Not applicable	84 days @ 125°C @ 480V.	request 2098 sheet 5f
Qualified Life Claimed/ Established (5.2.4/4.10/-)	Plant (40y) Life (40y)	> 50 years @ 70°C	reports 2100 2101 sheet 5f
Normal Ambient Temperature	60-120°F	70-120°F	
Normal Ambient Radiation	< 1 rd/h		
Normal Ambient Humidity	50% nom.		
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	Sinna Program for maintenance	Not applicable	
On-Going Analysis of Failures and Degradation (7.0/-/-)	PSR-30	Not applicable	
Margin (General) (6.0/3.0/3.0)	Not applicable	Not stated	enveloped Containment Profile.
Margin (NUREG-0588, Cat. I) (-/3.2/-)	Not Applicable	Not applicable	No Regosts Regt only
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. 32

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	see Note 2	Not Applicable	see note 2 pg-59
Radiation Type	Gamma	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	Not stated	$2.1 \times 10^8$ rd	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	$2.1 \times 10^4$	Not stated. Test (sequential)	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	Not applicable	Not Applicable	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)	Not stated	Not Stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	$1.5 \times 10^8$ rd	$2 \times 10^8$ rd.	
Plateout Dose Considered (-/1.48/1.48)	Not stated	Not Stated	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	Not stated	Not Stated	



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.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase	286°F/5 6psig/5	Not Stated	
Peak: °F/psig/RH/Time	286/60/100/27h	340°F/60/100/6h.	
Decrease To: °F/psig/RH/Time	250/20/100/27h	320°F/45/100/6h.	
Decrease To: °F/psig/RH/Time	225/20/100/8h	226°F/10/100/16h	
Decrease To: °F/psig/RH/Time		240°F/10/100/8h.	
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	Not Applicable	Not Applicable	Nureg 0588 only Req'd.
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	Test	Test (Simultaneous)	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	Boric Acid (2000-3000 ppm Boron) + NaOH pH 8-10	2000 ppm Boric Acid buffered with NaOH for pH 9-10	
Spray Density (gpm/ft <sup>2</sup> )	Not Stated	Not Stated	
Spray Duration	Not Stated	3 hours	
Submergence Duration (4.1.3/2.2.5/2.2.5)	Not Applicable	Not Applicable	
In-Leakage Considered (5.2.6, 5.3.2/-/-)	Leak test. 1x10 <sup>-6</sup> stdcc/s	1x10 <sup>-6</sup> stdcc/sec	
Time to Submergence	Not Applicable	Not Applicable	
Dust Environment (-/2.2.11/2.2.11)	Not Applicable	Not Applicable	



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

NOTES:

1. Report PEN-TR-81-45 dated August  
7, 1981 incorporated and referenced  
The following additional Reports.

- 2099. J. F. Quirk —  
Predicting the Thermal Life of Modular Penetrations —  
Westinghouse, 27-May-75 —  
75-7B5-BIGAL-R2 —
- 2100. R. L. Korner —  
Dielectric Strength and Insulation Resistance Test Results —  
of Westinghouse Modules which were Subjected to Accelerated —  
Heat Aging at 150 degrees C. —  
Westinghouse, 12-May-75 —  
PEN-TR-75-10 —
- 2101. R. L. Korner —  
Explanation of Accelerated Aging —  
Westinghouse, 07-Aug-81 —  
PEN-TR-81-46 —
- 2102. V. Liotino —  
Electrical Performance of an Electrical Penetration Module —  
under Accelerated Heat Aging Conditions —  
Westinghouse, 18-Sep-79 —  
PEN-TR-79-73 —
- 2103. F. M. McAvoy —  
Aging, Exposure to 200 Megarads of Gamma Radiation and —  
Accident Condition Qualification Testing of Power Cables, —  
Control Cables and Splice —  
Okonite Co., 29-Feb-72 —  
E.R. 141 —
- 2104. E. E. McIlveen, V. L. Garrison, and G. T. Dobrowolski —  
Class 1E Cables for Nuclear Power Generating Stations —  
IEEE, 16-Nov-73 —  
T 74 044-4 —
- 2105. E. E. McIlveen, V. L. Garrison, and G. T. Dobrowolski —  
Cables for Nuclear Power Generating Stations —  
Okonite Co., 24-Feb-75 —  
E.N. 74-1, Rev. —



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NRC Contract No. NRC-03-79-118  
FRC Project No. C5257  
FRC Assignment No. 13  
FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 32

NOTES:

The data from these reports has been included in pages 5a thru 5e of the check sheets.

Note 2 - The Licensee stated that new HELB/MSLB calculations are considered to be enveloped by LOCA testing.

Note 3 - Short Circuit Current evaluation is contained in PSR 72.



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33**

Equipment Item No. 33  
 Terminal Blocks Located Inside Containment (Area #1)  
 Westinghouse Model 542247  
 Provides Connection for Electrical Circuits  
 Licensee References 31, 39, and 718  
 Required Operating Time: Long term  
 TER Checksheet No. 33  
 Reference 59, Section 4.6.4  
 Licensee Submittal: Page 12 [62]; Table 3, Page 6 [1]; FRC SCEW 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:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

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

- The Licensee (has/~~has not~~) provided a response to the SER 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 ( replace if qualification test not successful )
- 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 relocate by Spring of 1982, Test/replace 6/30/82.)
- 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 |
| <u>I.b</u> Modification            | III.a Exempt                   |
| II.a Qualification Not Established | III.b Not in Scope             |
| II.b Not Qualified                 | IV Documentation Not Available |



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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 33

LICENSEE RESPONSE TO NRC SER

Item 4.6.4 addresses terminal blocks. These terminal blocks will be elevated, together with the pressurizer pressure and pressurizer level instrumentation, during the Spring 1982 refueling shutdown. Submergence will thus no longer be of concern.

To reduce the possibility of conductance between the terminals during an HELB, the terminal blocks will be periodically cleaned. At that time the blocks will be inspected for possible aging degradation. The steam test (FIRL #F-C4911-1) indicates that satisfactory performance may be expected for protected terminal blocks. The terminal blocks at Ginna are protected from direct spray impingement by their location in the pressurizer instrumentation cabinets. Also, resilient washers will be installed under the blocks to preclude any cracking of the block while mounting or connecting to the block.

Additional information is still being developed relative to qualification of these terminal blocks. If full documentation cannot be provided, either a type test will be conducted before June 30, 1982, or the terminal blocks will be replaced with fully qualified Raychem sleeves.





**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34**

Equipment Item No. 34  
 Electric Cables Located Inside Containment (Area #1)  
 Kerite Co. Cable Type HT  
 Power Cables, Provides Electrical Distribution  
 Licensee References 10, 34, 574, and 2052  
 Required Operating Time: Long term  
 TER Checksheet No. 34  
 Reference 59, Section 4.5.2.3  
 Licensee Submittal: Page 7 [62]; Table 3, Page 6 [1]; FRC SCEW 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:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34**

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and ~~is~~ will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                                                        |                                |
|------------------------------------------------------------------------|--------------------------------|
| I.a Qualified                                                          | II.c Qualified Life Deficiency |
| I.b Modification                                                       | III.a Exempt                   |
| <input checked="" type="checkbox"/> II.a Qualification Not Established | III.b Not in Scope             |
| II.b Not Qualified                                                     | IV Documentation Not Available |



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.

*The licensee should provide the analyses which address and resolve the problems described in notes 1 and 2 page 5F, 5g, 5h.*



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.3 addresses Kerite cable located inside containment. The FRC evaluation of this cable is in error. Contrary to the statement that this cable was "laid in the bottom of the box," these cables were actually the "main specimens" being tested together with the Raychem sleeves. The Kerite cable should be evaluated, accounting for this correction. RG&E considers that this cable is fully qualified to meet the DOR Guidelines, and should be classified as I.a.

As stated earlier, RG&E believes that the dose rate concern expressed in Appendix H goes beyond the scope of the DOR Guidelines, and is inappropriate for review in this document.

RG&E also notes that the cable testing performed in FIRC Report F-C4020-1 was at peak conditions greatly in excess of the Ginna post-accident environmental conditions. Testing performed at 340°F/113 psig should not be used to make judgments for cables installed at Ginna, whose peak environmental conditions are 286°F/60 psig. RG&E cannot make any definitive arguments relative to F-C4020-1, since it was not provided to us.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 34

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35**

Equipment Item No. 35  
 Electric Cables Located Inside Containment  
 Kerite Co. Cable Type HT  
 Control Cable, Provides Electrical Distribution  
 Licensee References 10, 34, 574, and 2052  
 Required Operating Time: Long term  
 TER Checksheet No. 35  
 Reference 59, Section 4.5.2.3  
 Licensee Submittal: Page 7 [62]; Table 3, Page 6 [1]; FRC SCEW 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:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/~~or~~ will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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





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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 35

NOTES:

*3a and 5a through h of Equipment  
item 34 apply to this item.*



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**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36**

Equipment Item No. 36  
 Electric Cables Located Outside Containment  
 Kerite Co., Cable Type HT  
 Control Cable, Provides Electrical Distribution  
 Licensee References 10, 34, 574, and 2052  
 Required Operating Time: Long term  
 TER Checksheet No. 36  
 Reference 59, Section 4.3.3.3  
 Licensee Submittal: Page 6 [52]; Table 3, Page 6 [1]; FRC SCEW 3d

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36**

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and ~~will~~ will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| <input checked="" type="radio"/> I.a Qualified | II.c Qualified Life Deficiency |
| I.b Modification                               | III.a Exempt                   |
| II.a Qualification Not Established             | III.b Not in Scope             |
| II.b Not Qualified                             | IV Documentation Not Available |



**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

Item 4.3.3.3 addresses Kerite power cable outside containment. The FRC "Conclusion" notes that a conservative qualified life should be determined. Yet the FRC "Evaluation" states that thermal aging does not simulate all aging conditions to which the cable would be subjected, and thus disagrees with the RG&E establishment of a 93.3 year life at 140°F based on Arrhenius data. Since the DOR Guidelines address only thermal and radiation aging, and since both of these concerns have been addressed for this cable, no additional information should be required for resolution of this item.

Since this cable is safety-related electrical equipment, Reference 72 concerning maintenance/surveillance applies.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 36

NOTES:

Reevaluation of the qualification  
references established that the  
cable in this application should  
be suitable for plant life.



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37**

Equipment Item No. 37  
 Electrical Cable Located Inside Containment (Area #1)  
 Coleman Cable Co.  
 Instrumentation Cables  
 Licensee References 29 and 2052  
 Required Operating Time: Long term  
 TER Checksheet No. 37  
 Reference 59, Section 4.5.2.7  
 Licensee Submittal: Page 9 [62]; Table 3, Page 6 [1]; FRC SCEW 39

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and ~~will~~ will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                    |                                       |
|------------------------------------|---------------------------------------|
| I.a Qualified                      | <u>II.c</u> 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)	<u>X</u> _____
Program Established to Identify Aging Degradation	_____
Criteria Regarding Aging Simulation Satisfied (If Required)	_____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	_____
o Peak Pressure Adequate	_____
o Duration Adequate	_____
o Required Profile Enveloped Adequately	_____
o Steam Exposure (If Required) Adequate	_____
Criteria Regarding Spray Satisfied	_____
Criteria Regarding Submergence Satisfied	_____
Criteria Regarding Radiation Satisfied	_____
Criteria Regarding Test Sequence Satisfied	_____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	_____
Criteria Regarding Functional Testing Satisfied	_____
Criteria Regarding Instrument Accuracy Satisfied	_____
Test Duration Margin (1 hour + Function Time) Satisfied	_____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	_____

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.7 addresses Coleman cable located inside containment. The major concern expressed in the TER is that the radiation dose to which this cable was exposed during radiation testing could not be quantified. Although this observation may be correct, it is apparent that a lower limit on the amount of radiation received can be easily estimated.

The radiation source during the test consisted of a plaque array of Cobalt-60 elements approximately 60 inches by 72 inches wide. The only significant attenuation of the gamma flux was due to a 1/2" steel plate. For 1.33 MeV gamma, the attenuation factor for 1/2" steel is conservatively (collimated beam without buildup) calculated as about 0.60. The actually measured integrated dose at the back of the crate top was  $6.93 \times 10^7$  rads. Thus, a conservative estimate of the lower bound of the cable radiation dose received is  $4.17 \times 10^7$  rads. This is appreciably higher than the  $2 \times 10^7$  rads required by the DOR Guidelines. The DOR Guidelines are thus met.

As noted earlier, RG&E believes that the beta dose rate concerns of Appendix H go beyond the requirements of the DOR Guidelines, and are inappropriate for review in this document.

Based on the above information, RG&E considers that the DOR Guidelines are met for this cable.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 37

NOTES:

The Licensee has provided  
radiation evaluation to resolve  
the deficiency concerning radiation  
However the qualification for  
aging has not been provided



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

Equipment Item No. 38  
 Electrical Cables Located Outside Containment  
 Coleman Cable Co.  
 Provides Electrical Distribution  
 Licensee References 29 and 2052  
 Required Operating Time: Long term  
 TER Checksheet No. 38  
 Reference 59, Section 4.5.2.8  
 Licensee Submittal: Page 10 [62]; Table 3, Page 6 [1]; FRC SCEW 40

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 3B

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 (verify radiation resistance of cable)
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (~~has~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



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)	<u>X</u> _____
Program Established to Identify Aging Degradation	_____
Criteria Regarding Aging Simulation Satisfied (If Required)	_____
Criteria Regarding Temperature/Pressure Exposure:	
o Peak Temperature Adequate	_____
o Peak Pressure Adequate	_____
o Duration Adequate	_____
o Required Profile Enveloped Adequately	_____
o Steam Exposure (If Required) Adequate	_____
Criteria Regarding Spray Satisfied	_____
Criteria Regarding Submergence Satisfied	_____
Criteria Regarding Radiation Satisfied	<u>X</u> _____
Criteria Regarding Test Sequence Satisfied	_____
Criteria Regarding Test Failures or Severe Anomalies (If Any) Satisfied	_____
Criteria Regarding Functional Testing Satisfied	_____
Criteria Regarding Instrument Accuracy Satisfied	_____
Test Duration Margin (1 hour + Function Time) Satisfied	_____
Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I)	_____

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A  
 Equipment Item description.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 38

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.8 and 4.5.2.9 address electrical cables located outside containment. A preliminary evaluation of the expected post-accident dose has been made, based on the information provided in RG&E October 31, 1980 submittal, Accident Reference [TMI-3]. It is expected that the integrated dose three feet from the recirculation piping would be less than  $3 \times 10^5$  rads. The cables in question are further from the source.

Information presented in draft EPRI Report 1707-3, "Radiation Effects on Organic Materials in Nuclear Plants," cites a radiation threshold for PVC (the materials of the cables in question) of  $5 \times 10^5$  rads. It is thus not expected that any damage potential exists.

RG&E has not yet completed confirmation of this issue. When completed and verified, proper documentation will be made available for NRC staff review.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

Equipment Item No. 39  
 Electrical Cables Located Outside Containment  
 Rome Cable Co.  
 Licensee References 9, 29, and 2052  
 Required Operating Time: Long term  
 TER Checksheet No. 39  
 Reference 59, Section 4.5.2.8  
 Licensee Submittal: Page 9 [62]; Table 3, Page 7 [1]; FRC SCEW 41

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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





**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39**

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

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

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

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

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

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

Corrective action specified by the Licensee:

Equipment replacement with qualified equipment

Equipment modification

Equipment relocation above submergence level

Relocate or shield equipment from radiation source

Verify qualification by additional (testing/analysis)

Equipment relocation to a mild environment

Qualification testing of equipment in progress

Other (verify radiation resistance of cable)

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. 39**

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

- Documented Evidence of Qualification Adequate \_\_\_\_\_
- Adequate Similarity Between Equipment and Test Specimen Established \_\_\_\_\_
- Aging Degradation Evaluated Adequately \_\_\_\_\_
- Qualified Life or Replacement Schedule Established (If Required) 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 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 \_\_\_\_\_

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 39

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.8 and 4.5.2.9 address electrical cables located outside containment. A preliminary evaluation of the expected post-accident dose has been made, based on the information provided in RG&E October 31, 1980 submittal, Accident Reference [TMI-3]. It is expected that the integrated dose three feet from the recirculation piping would be less than  $3 \times 10^5$  rads. The cables in question are further from the source.

Information presented in draft EPRI Report 1707-3, "Radiation Effects on Organic Materials in Nuclear Plants," cites a radiation threshold for PVC (the materials of the cables in question) of  $5 \times 10^5$  rads. It is thus not expected that any damage potential exists.

RG&E has not yet completed confirmation of this issue. When completed and verified, proper documentation will be made available for NRC staff review.



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**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40**

Equipment Item No. 40  
 Electrical Cables Located Outside Containment  
 General Cable Co.  
 Licensee References 9, 29, and 2052  
 Required Operating Time: Long term  
 TER Checksheet No. 40  
 Reference 59, Section 4.5.2.9  
 Licensee Submittal: Page 10 [62]; FRC SCEW 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:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

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

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

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

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

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

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

Corrective action specified by the Licensee:

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

Other (verify radiation resistance of cable)

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

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

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

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

- |                                                                        |                                |
|------------------------------------------------------------------------|--------------------------------|
| I.a Qualified                                                          | II.c Qualified Life Deficiency |
| I.b Modification                                                       | III.a Exempt                   |
| <input checked="" type="checkbox"/> 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) 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 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 \_\_\_\_\_

This equipment item was previously evaluated in Reference 59. See page 1A  
 Equipment Item description.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 40

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.8 and 4.5.2.9 address electrical cables located outside containment. A preliminary evaluation of the expected post-accident dose has been made, based on the information provided in RG&E October 31, 1980 submittal, Accident Reference [TMI-3]. It is expected that the integrated dose three feet from the recirculation piping would be less than  $3 \times 10^5$  rads. The cables in question are further from the source.

Information presented in draft EPRI Report 1707-3, "Radiation Effects on Organic Materials in Nuclear Plants," cites a radiation threshold for PVC (the materials of the cables in question) of  $5 \times 10^5$  rads. It is thus not expected that any damage potential exists.

RG&E has not yet completed confirmation of this issue. When completed and verified, proper documentation will be made available for NRC staff review.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41

Equipment Item No. 41  
 Level Transmitter Located in Auxiliary Building (Area #2)  
 Foxboro Model 611 GM-ASI  
 RWST Level (LT-920)  
 Licensee reference not cited  
 Required Operating Time: Short term (before sump recirculation)  
 TER Checksheet No. 41  
 Reference 59, Section 4.3.1.3  
 Licensee Submittal: Page 5 [62]; Table 3, Page 7 [1]; FRC SCEW 43

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

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

LISTING OF APPLICABLE CHECKSHEETS:

<u>Contents</u>	<u>Checksheet Page No.</u>
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, <del>3b</del> , <del>3c</del> , <del>3d</del>
System Consideration Review	<del>3e</del> , <del>3f</del> , <del>3g</del> , <del>3h</del> , <del>3i</del> , <del>3j</del>
Equipment Environmental Qualification Review	<del>3k</del> , <del>3l</del> , <del>3m</del> , <del>3n</del> , <del>3o</del> , <del>3p</del> , <del>3q</del> , <del>3r</del> , <del>3s</del> , <del>3t</del>
Installed TMI Lessons Learned Implementation Equipment Summary	<del>3u</del> , <del>3v</del>
Maintenance and Replacement Schedule Summary	<del>3w</del> , <del>3x</del> , <del>3y</del>





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 41**

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

LICENSEE RESPONSE TO NRC SER

In Section 4.3.1, equipment is judged to meet all applicable requirements of the DOR Guidelines except qualified life. As noted earlier, Reference 72 provides information about RG&E's surveillance/ maintenance program to meet Section 7.0 of the DOR Guidelines. Specific equipment items are addressed below:

4.3.1.3 - RWST Level Transmitter - to be replaced by June 30, 1982.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

Equipment Item No. 42  
 Level Switch Located in Auxiliary Building (Area #2)  
 ITT-Barton Model 289  
 RWST Level (LIC-921)  
 Licensee reference not cited  
 Required Operating Time: Short term (before sump recirculation)  
 TER Checksheet No. 42  
 Reference 59, Section 4.5.2.2  
 Licensee Submittal: Page 7 [62]; Table 3, Page 7 [1]; FRC SCEW 44

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42**

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                    |                                |
|------------------------------------|--------------------------------|
| I.a Qualified                      | II.c Qualified Life Deficiency |
| I.b Modification                   | III.a Exempt                   |
| II.a Qualification Not Established | <u>III.b</u> Not in Scope      |
| II.b Not Qualified                 | 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 \_\_\_\_\_
- III.b Equipment Not in the Scope of the Qualification Review X \_\_\_\_\_
- IV Documentation Not Made Available \_\_\_\_\_

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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FRC Assignment No. 13  
FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.2 addresses the RWST level switch. When required to perform its safety function, this item does not experience a "harsh" environment. Environmental qualification testing is thus not required. FRC has also concluded that qualification is not required. However, the maintenance/surveillance program in Reference 72 will apply to this item.

Although RG&E had originally thought to replace this item by June 30, 1982, it does not appear necessary because of its location in a "mild" environment.



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

Reason for Non-Concurrence

— Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not 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.

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 not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

— 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)

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

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

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

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





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 42

Reason for Concurrence

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

Other (see page\_\_\_)

Resultant NRC Qualification Evaluation Category (IIIa) (IIIb)

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

Reason for Non-Concurrence

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

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

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

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

TER-C5257-178 concluded that this equipment performed its safety function before being exposed to any harsh environment. At that time, the Licensee intended to replace the equipment for added assurance of post-accident monitoring. The Licensee has now determined that this is unnecessary because of its location in a mild environment.

Conclusion

It is agreed (with the Licensee) that replacement of this item is not necessary.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

Equipment Item No. 43  
 Flow Transmitters Located Inside Containment (Area #1)  
 Barton Model 332  
 Steam Line Flow Transmitters (FT-464, 465, 474, and 475)  
 Licensee Reference 567  
 Required Operating Time: Seconds  
 TER Checksheet No. 43  
 Reference 59, Section 4.6.7  
 Licensee Submittal: Page 12 [62]; Table 3, Page 7 [1]; FRC SCEW 45

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43**

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 \_\_\_\_\_

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

LICENSEE RESPONSE TO NRC SER

Item 4.6.7 addresses steam line flow transmitters inside containment. In RG&E's October 31, 1980 submittal, we stated that we planned to replace these transmitters by June 30, 1982. However, it is not clear that replacement is required. As stated by RG&E previously, these transmitters are not required to perform a safety function during an HELB, since the non-return check valves will isolate the intact steam generator from the break. The check valves are the primary isolation means, since they operate more quickly (1-2 seconds) than the 5 second MSIV's. For a large break inside containment, the containment pressure transmitters will signal the MSIV's to close. A steam line break analysis presently being performed by the NRC for SEP Topics VI-2.D and VI-3 will be completed soon. RG&E will at that time be able to define if the containment pressure transmitters will serve as a suitable backup for the steam line flow transmitters, in the event of a steam line break.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 43

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. 43

Reason for Concurrence

- The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)
- Other (see page     )
- Resultant NRC Qualification Evaluation Category (IIIa/IIIb)
- Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page     )

Reason for Non-Concurrence

- Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.
- Backup (equipment/system) is not safety-related.
- This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.
- The rationale presented by the Licensee is not supported by objective technical evidence.
- Other (see page 4b)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

An evaluation of this item is not presently possible since the Licensee's determination of the status of these transmitters is awaiting completion of the steam line break analysis. These transmitters are considered as requiring environmental qualification until such time as a contrary determination is made.



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 FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

Equipment Item No. 44  
 Pressure Transmitters Located in Intermediate Building  
 ITT-Barton Model 332  
 Containment Pressure Transmitters (PT-945, 946, 947, 948, and 949)  
 Licensee Reference 567  
 Required Operating Time: Long term  
 TER Checksheet No. 44  
 Reference 59, Section 4.6.8  
 Licensee Submittal: Page 13 [62]; Table 3, Page 7 [1]; FRC SCEW 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:

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





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                    |                                |
|------------------------------------|--------------------------------|
| I.a Qualified                      | II.c Qualified Life Deficiency |
| I.b Modification                   | III.a Exempt                   |
| II.a Qualification Not Established | <u>III.b</u> Not in Scope      |
| II.b Not Qualified                 | 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 \_\_\_\_\_
- 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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 44

LICENSEE RESPONSE TO NRC SER

Item 4.6.8 addresses the containment pressure transmitters located in the intermediate building. The five transmitters being replaced are those located in the auxiliary building, where the potential for higher radiation levels as a result of post-LOCA sump recirculation dictated their replacement. The intermediate building will not experience a harsh environment for an HELB inside containment, which is the only time these transmitters are required to operate. Although they would see a harsh environment as the result of an HELB in the intermediate building, they have no function to perform during such an event. It is thus considered that these two transmitters need only function in a "mild" environment.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

Equipment Item No. 45  
 Pressure Transmitters Located Inside Containment (Area #1)  
 Foxboro Model 611 GM-DSI  
 Pressurizer Pressure (PT-429, 430, 431, 449)  
 Licensee References 637 and 639  
 Required Operating Time: Short term  
 TER Checksheet No. 45  
 Reference 59, Section 4.6.5  
 Licensee Submittal: Page 12 [62]; Table 3, Page 8 [1]; FRC SCEW 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:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                                   |                                |
|---------------------------------------------------|--------------------------------|
| I.a Qualified                                     | II.c Qualified Life Deficiency |
| <input checked="" type="radio"/> I.b Modification | III.a Exempt                   |
| II.a Qualification Not Established                | III.b Not in Scope             |
| II.b Not Qualified                                | IV Documentation Not Available |



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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 45

LICENSEE RESPONSE TO NRC SER

Item 4.6.5 and 4.6.6 address pressurizer pressure and pressurizer level transmitters located inside containment. As noted previously, RG&E has committed to replace and elevate these instruments by June 30, 1982. Emergency procedures at Ginna specify the operator is not to terminate SI flow unless all of the following are in evidence: Safety Injection flow is zero, pressurizer pressure is increasing and greater than 2000 psig, pressurizer level is greater than 50%, RCS subcooling is greater than 50°F, and steam generator water level narrow range is greater than 25% in one generator. RG&E considers this to be a very conservative set of SI termination criteria.



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**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46**

Equipment Item No. 46  
 Pressure Transmitters Located in Intermediate Building (Area #3)  
 Foxboro Model 611 GM-DSJ  
 Steam Line Pressure (PT-458, 469, 478, 479, 482, 483)  
 Licensee References 637 and 639  
 Required Operating Time: Short term  
 TER Checksheet No. 46  
 Reference 59, Section 4.3.1.1  
 Licensee Submittal: Page 5 [62]; Table 3, Page 8 [1]; FRC SCEW 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:

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





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46**

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 46

LICENSEE RESPONSE TO NRC SER

In Section 4.3.1, equipment is judged to meet all applicable requirements of the DOR Guidelines except qualified life. As noted earlier, Reference 72 provides information about RG&E's surveillance/ maintenance program to meet Section 7.0 of the DOR Guidelines. Specific equipment items are addressed below:

- a) 4.3.1.1 - Steam Line Pressure Transmitters - these are to be replaced by June 30, 1982.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

Equipment Item No. 47  
 Level Transmitters Located Inside Containment (Area #1)  
 Foxboro Model 613 M-MDL, Modified  
 Monitors Pressurizer Level (LT-426, 427, 428, and 433)  
 Licensee reference not cited  
 Required Operating Time: Not specified  
 TER Checksheet No. 47  
 Reference 59, Section 4.6.6  
 Licensee Submittal: Page 12 [62]; Table 3, Page 8 [1]; FRC SCEW 49

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                                   |                                |
|---------------------------------------------------|--------------------------------|
| I.a Qualified                                     | II.c Qualified Life Deficiency |
| <input checked="" type="radio"/> I.b Modification | III.a Exempt                   |
| II.a Qualification Not Established                | III.b Not in Scope             |
| II.b Not Qualified                                | IV Documentation Not Available |



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A  
 Equipment Item description.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 47

LICENSEE RESPONSE TO NRC SER

Item 4.6.5 and 4.6.6 address pressurizer pressure and pressurizer level transmitters located inside containment. As noted previously, RG&E has committed to replace and elevate these instruments by June 30, 1982. Emergency procedures at Ginna specify the operator is not to terminate SI flow unless all of the following are in evidence: Safety Injection flow is zero, pressurizer pressure is increasing and greater than 2000 psig, pressurizer level is greater than 50%, RCS subcooling is greater than 50°F, and steam generator water level narrow range is greater than 25% in one generator. RG&E considers this to be a very conservative set of SI termination criteria.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

Equipment Item No. 48  
 Level Transmitters Located in Auxiliary Building (Area #2)  
 Foxboro Model 613 DM-MSI  
 BAST Level (LT-102, 106, 171, 172)  
 Licensee reference not cited  
 Required Operating Time: Short term  
 TER Checksheet No. 48  
 Reference 59, Section 4.3.1.2  
 Licensee Submittal: Page 5 [62]; Table 3, Page 8 [1]; FRC SCEW 50

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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





**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48**

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A  
 Equipment Item description.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 48

LICENSEE RESPONSE TO NRC SER

In Section 4.3.1, equipment is judged to meet all applicable requirements of the DOR Guidelines except qualified life. As noted earlier, Reference 72 provides information about RG&E's surveillance/ maintenance program to meet Section 7.0 of the DOR Guidelines. Specific equipment items are addressed below:

- b) 4.3.1.2 - BAST Level Transmitters - see reference 72 for "aging" program.

72  
Maintenance/Surveillance Program to Detect  
Failures (Including Age-Related) of Electrical Equipment

A form similar to the attached form is to be used to evaluate causes of failure of all safety-related electrical equipment, both in a "harsh" and in a "mild" environment. This form has not yet been formally approved for Ginna. Implementation will be effected by September 30, 1981. All failures during operation, testing, or calibration will be evaluated for failure mechanism. If aging of a component or material type is noted to be a potential concern, an evaluation of other components using this component or material will also be made.

This form is an update of the Ginna administrative measures described in Reference 2.47 to detect aging effects in Ginna electrical components.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

Equipment Item No. 49  
 Level Transmitters Located Inside Containment (Area #1)  
 Foxboro Model 613 HM-HSI  
 Steam Generator Level (LT-470, 471, 472, 473, 460, 461, 462, 463)  
 Licensee reference not cited  
 Required Operating Time: Not specified  
 TER Checksheet No. 49  
 Reference 59, Section 4.6.11  
 Licensee Submittal: Page 13 [62]; Table 3, Page 8 [1]; FRC SCEW 51

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

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 \_\_\_\_\_

This equipment item was previously evaluated in Reference 59. See page 1A  
 Equipment Item description.



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NRC Contract No. NRC-03-79-118  
FRC Project No. C5257  
FRC Assignment No. 13  
FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO 19

LICENSEE RESPONSE TO NRC SER

Item 4.6.11 addresses the steam generator level transmitters. As previously committed, these instruments will be replaced by June 30, 1982.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 49

SYSTEM CONSIDERATION REVIEW

EVALUATION OF LICENSEE STATEMENT

This equipment item was previously evaluated in Reference 59.

*The evaluation is reproduced below.*

EVALUATION:

FRC concurs with RG&E's plan for qualification of these instruments for the long term. FRC does not find technical discrepancies in the Licensee position stated above, even though FRC believes that steam generator operation would be very difficult without operational level instruments. At the same time, however, precautions should be taken to ensure that the possibility of faulty indication causing the operator to take undesirable action, such as stopping auxiliary feedwater (AFW) flow, is minimized.

CONCLUSION:

Until these instruments are replaced with qualified instruments, the Licensee should ensure that emergency procedures are extremely conservative with regard to use of unqualified instruments as the basis for operational decisions, such as securing AFW (e.g., procedure might require two of three level instruments in agreement and responding normally to changes in feed rate).





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

Equipment Item No. 50 (TMI Action Plan Item II.F.2)  
 Resistance Temperature Detectors Located Inside Containment (Area #1)  
 Rosemount Model 176JA  
 Reactor Coolant System Temperature (Plant ID Not Stated)  
 Licensee Reference 571  
 Required Operating Time: Not specified  
 TER Checksheet No. 50  
 Reference 59, Section 4.6.10  
 Licensee Submittal: Page 13 [62]; Table 3, Page 9 [1]; FRC SCEW 52

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a Partial corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other (only replace subcooling meter RTD's)
- 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 June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.

The licensee has committed to replace the RTD's used in the subcooling monitor with qualified items but not the remaining units. (see pages 4a, 4b, 4c)



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

LICENSEE RESPONSE TO NRC SER

Item 4.6.10 addresses the RTD's. As previously noted, RG&E has committed to replace the RTD's required as input to the subcooling meter, as a "TMI-related" modification. RG&E does not consider the RTD's as necessary for the mitigation of a LOCA. Although FRC refers to E.5 of Appendix E, no discussion is provided there, or anywhere else throughout Appendix E.

RG&E is also aware that the environmental service conditions for the RTD's include both RCS conditions and containment conditions. This will be accounted for in the replacement units.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

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 ~~concurrency~~ non-concurrency with the technical basis of the Licensee's position are presented below.

Reason for Concurrence

Reason for Non-Concurrence

— Equipment does not provide a safety function or mitigate the consequences of a design basis accident. Equipment Environmental Qualification is not 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.

— 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 not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

— 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)

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

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

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

Reason for Concurrence

- The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)
- Other (see page\_\_\_)
- Resultant NRC Qualification Evaluation Category (IIIa/IIIb)
- Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page\_\_\_)

Reason for Non-Concurrence

- Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.
- Backup (equipment/system) is not safety-related.
- This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.
- The rationale presented by the Licensee is not supported by objective technical evidence.
- Other (see page\_\_\_)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

The Licensee Response, quoted on pg. 4-91 of TER-C5257-178, indicated that reactor coolant system RTD's were not required for LOCAs or MSLBs, with exception of a low Tavg signal which contributed to the shutting of the main steam isolation valves (MSIVs). FRC referred to Item E.5 of Appendix E to TER-C5257-178 because of the discussion in that section of the desirability of shutting the MSIVs as a backup to the nonreturn check valve in the broken line during a MSLB inside containment. FRC considered all of this discussion to be largely moot, however, because of the last two sentences of the Licensee response which stated:

"However, to avoid the possibility of operator confusion, RGE will initiate a program to provide qualified RTDs for post-accident monitoring. These will be procured and installed by June 1982, subject to equipment availability and procurement/delivery schedules."



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. SC

SYSTEM CONSIDERATION REVIEW

EVALUATION OF LICENSEE STATEMENT (Continued)

The Licensee Response to the NRC SER (page 3a of this checksheet), however, indicates that the Licensee did not commit to replacing all of the reactor coolant system RTDs but only to replacing RTDs with an input to the subcooling meter. In view of this statement, it appears that the Licensee still considers the remaining RTDs as not requiring environmental qualification. FRC does not concur that these RTDs are not required for post-accident monitoring.

Reactor coolant system temperature indication is required during the initial phases of a design basis accident, during a cooldown to cold shutdown conditions, and during subsequent long-term cooling. The hot-leg detectors aid in determining reactor system subcooling and in providing indication of natural circulation. The cold-leg instruments also provide indication of natural circulation, provide input to heat balance calculations, and provide direct indication of ECCS injection. During plant cooldown, these detectors are necessary to ensure that cooldown rates are not being exceeded. They are also necessary to ensure that the long-term cooling method is functioning properly.

In view of the above discussion, it is concluded that the reactor coolant system RTDs should be fully qualified for their post-accident environment.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

INSTALLED TMI LESSONS LEARNED IMPLEMENTATION EQUIPMENT SUMMARY

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

This plant is a PWR X, BWR     .

The NSSS Vendor is Westinghouse (W) X, Babcox & Wilcox (B&W)     ,  
Combustion Engineering (CE)     , General Electric (GE)     .

With respect to this equipment item, it is noted (applicable section checked):

- The Licensee does not provide adequate information with respect to identification of TMI Action Plan equipment installed as of 1/1/81.
- The Licensee has not provided the correlation of this equipment item with the specific sections of NUREG-0737. [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and the terminal blocks associated with the device also identified?]
- The Licensee has not provided the approximate installation date for the TMI Action Plan equipment items so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation.
- The Licensee has provided a standard Owners' Group position with respect to a NUREG-0737 technical area.
- The Licensee has requested extensions of implementation dates.
- The Licensee has stated that this equipment item is associated with the following section of NUREG-0737. (This list of applicable NUREG-0737 sections has been identified by NRC as sections within the scope of this review):
  - II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment
  - II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 50

- II.E.1.2 (PWR/1-1-81) Auxiliary Feedwater System Automatic Initiation and Flow Indication
- II.E.3.1 (PWR/1-1-81) Emergency Power Supply for Pressurizer Heaters (Safety-Grade Interfaces)
- II.E.4.1 (ALL/7-1-81) Dedicated Hydrogen Penetrations
- II.E.4.2 (ALL/1-1-81) Containment Isolation Dependability
- II.F.2 (PWR/1-1-81) Instrumentation for Detection of Inadequate Core Cooling
- II.G.1 (PWR/1-1-81) Emergency Power for Pressurizer Equipment (Safety-Grade Interfaces)
- II.K.2.10 (PWR/B&W/7-1-81) Safety-Grade Anticipatory Reactor Trip
- II.K.3.9 (PWR/W/1-1-81) PID Controller Modification (If Hardware Change Involved)
- II.K.3.12 (PWR/W/1-1-81) Anticipatory Reactor Trip upon Turbine Trip
- II.K.3.13 (BWR/GE/7-1-81) Separation of HPCI / RCIC Initiation Signals
- II.K.3.15 (BWR/GE/7-1-81) Prevention of Spurious Isolation of HPCI and RCIC Systems
- II.K.3.19 (BWR/GE/7-1-81) Interlock on Recirculation Pump Loop
- II.K.3.21 (BWR/GE/7-1-81) Restart of Core Spray and LPCI Systems (If Hardware Changed Out)
- II.K.3.27 (BWR/GE/7-1-81) Provide Common Reference Level for Vessel Level Instrumentation (If Hardware Changed Out)



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

Equipment Item No. 51  
 Battery Banks Located in Battery Rooms on Basement Level of Control  
 Building (Area #8)  
 Gould Industrial Battery Division, Model FTA-19  
 Provide DC Power Supply (Plant ID Not Stated)  
 Licensee Reference 22  
 Required Operating Time: Long term  
 TER Checksheet No. 51  
 Reference 59, Section 4.7.9  
 Licensee Submittal: Table 3, Page 9 [1]; FRC SCEW 53

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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                   |
| I.c Qualification Not Established | <u>III.b</u> 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 \_\_\_\_\_
- 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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

Equipment Item No. 52  
 Diesel Generator Electrical Equipment Located in D/G Annex (Area #4)  
 ALCO Diesel Engine, Model 251F and Controls  
 Power Supply to Safeguards Buses (Plant ID Not Stated)  
 Licensee reference not cited  
 Required Operating Time: Long term  
 TER Checksheet No. 52  
 Reference 59, Section 4.7.10  
 Licensee Submittal: Table 3, Page 9 [1]; FRC SCEW 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:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52**

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

MILD ENVIRONMENT



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53

Equipment Item No. 53  
 Diesel Generator Electrical Equipment Located in D/G Annex (Area #4)  
 Westinghouse 1900 kW Generator and Controls  
 Power Supply to Safeguards Buses (Plant ID Not Stated)  
 Licensee reference not cited  
 Required Operating Time: Long term  
 TER Checksheet No. 53  
 Reference 59, Section 4.7.10  
 Licensee Submittal: Table 3, Page 9 [1]; FRC SCEW 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:

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





**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 53**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/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 | <u>III.b</u> Not in Scope      |
| II.b Not Qualified                 | 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 \_\_\_\_\_
- III.b Equipment Not in the Scope of the Qualification Review X \_\_\_\_\_
- IV Documentation Not Made Available \_\_\_\_\_

MILD ENVIRONMENT



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

Equipment Item No. 54  
 Diesel Generator Electrical Equipment Located in D/G Annex (Area #4)  
 Westinghouse Model 1 hp TEFC AC Motor  
 Drives Fuel Oil Transfer Pump (Plant ID Not Stated)  
 Licensee reference not cited  
 Required Operating Time: Long term  
 TER Checksheet No. 54  
 Reference 59, Section 4.7.10  
 Licensee Submittal: Table 3, Page 9 [1]; FRC SCEW 56

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,  
 Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 54

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
 X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

- I.a Equipment Qualified \_\_\_\_\_
- I.b Equipment Qualification Pending Modification \_\_\_\_\_
- 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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

Equipment Item No. 55  
 Reactor Containment Fan Cooler Motors Located Inside Containment (Area #1)  
 Westinghouse 588.5-CSP  
 Containment Cooling (Plant ID Not Stated)  
 Licensee References 40, 41, 42, 606, 637, 639, and 640  
 Required Operating Time: Long term  
 TER Checksheet No. 55  
 Reference 59, Section 4.5.2.4  
 Licensee Submittal: Page 7 [62]; Table 3, Page 9 [1]; FRC SCEW 57

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other (will replace currently installed grease w/a Chevron equivalent to the originally tested Westinghouse type.)
- 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 Spring 1982 refueling outage.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                                                        |                                |
|------------------------------------------------------------------------|--------------------------------|
| I.a Qualified                                                          | II.c Qualified Life Deficiency |
| I.b Modification                                                       | III.a Exempt                   |
| <input checked="" type="checkbox"/> II.a Qualification Not Established | III.b Not in Scope             |
| II.b Not Qualified                                                     | IV Documentation Not Available |



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55**

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

See page 5k For Conclusions

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.4 addresses the Reactor Containment Fan Coolers Located Within Containment. Several concerns were addressed, which are discussed below:

- a) FRC notes that RG&E did not completely address LOCA parameter effects on the lubrication system, insulation, and other components of the motor. Actually, Reference 2.18, WCAP-7410-L, provides this information. RG&E has added a small amount of ARCO Rotanium lubricant to the original Westinghouse lubricant. Although the Rotanium lubricant does not have any specific testing for post-LOCA radiation, the small amount added (estimated by review of plant records of the fan cooler motor maintenance history at no more than 10%) is not expected to adversely affect the performance of the lubrication system. As a result of this review, however, RG&E will no longer use the Rotanium lubricant, but will use a Chevron product which is equivalent to the original Westinghouse lubricant, with a radiation resistance of  $5 \times 10^6$  rads. Qualification information regarding this lubricant is being obtained. It will be submitted following receipt by RG&E. RG&E, therefore, considers the lubrication system acceptable for post-accident operation.

FRC also noted that splice material is still in question. This will be addressed in 21.c) below. RG&E has confirmed that Okonex tape and Elastimould No. 86 was not used for splice material in the fan cooler motors.

FRC also notes the confusion created by RG&E references 2.67 and 2.20. The fan cooler motor insulation is "Thermalastic Epoxy." This is consistent with the qualification documentation provided by WCAP-9003 and WCAP-7410-6. Reference 2.67 will be corrected when the Ginna Environmental Qualification Report is resubmitted.

- b) A review was made of plant maintenance records to determine if the fan cooler motor bearings, or other motor components had had any noted failures or degradation. No such evidence was found. RG&E will include the fan cooler motor bearings in the maintenance/surveillance program described in Reference 72.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

LICENSEE RESPONSE TO NRC SER (Continued)

- c) Although Westinghouse drawings 206C391, referenced via transmittal of supplemental information for Reference 2.64, is not an "as-built" for Ginna, RG&E has every reason to expect this to be the proper splice material. Reference 2.64 indicates that the splice met all required test parameters, including pressure, chemical spray, and radiation. RG&E believes that it was an oversight in not specifying accident temperatures along with the accident pressures of 60 psig for 2 hours and 20 psig for 18 hours; however, it is expected that at least 286°F was used together with 60 psig, and 219°F with 20 psig, since this corresponds well to the general Westinghouse qualification profile in use at that time (see WCAP-7410-L), and because the specified test conditions are identical in every respect to those used in WCAP-7410-L, except for the omission of these temperatures.

Based on the testing performed as shown in Reference 2.64, RG&E concludes that the splice is acceptable for use inside containment. If during our Spring 1982 refueling shutdown it is found that the splice shown in Westinghouse drawing 206C391 is not the same as that used at Ginna, the lead-to-cable splice will be replaced with a fully qualified Raychem sleeve.

It should be noted that this information pertains only to the lead-to-cable splice. The motor-to-lead splice was tested together with the motor in WCAP-9003, and is thus qualified by virtue of the acceptability of the motor qualification test.



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NRC Contract No. NRC-03-79-118  
FRC Project No. C5257  
FRC Assignment No. 13  
FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 55

MAINTENANCE AND REPLACEMENT SCHEDULE SUMMARY

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

The licensee has committed to replace the currently installed grease with a chevron equivalent to the qualified westinghouse type during the Spring 1982 refueling outage.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

Equipment Item No. 56  
 Medium Voltage Switchgear Located in Intermediate Building (Area #3)  
 Westinghouse Model DB-50A 1600-A  
 Controls Reactor Trip System Power (Plant ID Not Stated)  
 Licensee Reference 2898  
 Required Operating Time: Seconds  
 TER Checksheet No. 56  
 Reference 59, Section 4.6.1  
 Licensee Submittal: Page 10 [62]; Table 3, Page 9 [1]; FRC SCEW 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:

<u>Contents</u>	<u>Checksheet Page No.</u>
Equipment Item	1a
Summary of Licensee Responses to the NRC SER	1b
Equipment Environmental Qualification Summary Forms	2
Licensee Response to NRC SER	3a, <del>3b</del> , <del>3c</del> , <del>3d</del>
System Consideration Review	<del>3e</del> , <del>4a</del> , 4c, <del>4b</del> , <del>3e</del> , <del>4d</del>
Equipment Environmental Qualification Review	<del>3e</del> , <del>3e</del> , <del>3e</del> , <del>3e</del> , <del>3e</del> , <del>3e</del> , <del>3e</del> , <del>3e</del> , <del>3e</del> , <del>3e</del>
Installed TMI Lessons Learned Implementation Equipment Summary	<del>3e</del> , <del>3e</del>
Maintenance and Replacement Schedule Summary	<del>7a</del> , <del>7a</del> , <del>7c</del>



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/~~has not~~) specifically stated that the equipment ~~is~~ qualified will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/~~has not~~) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (~~testing~~/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (~~has~~/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 56

LICENSEE RESPONSE TO NRC SER

Item 4.6.1 addresses Medium Voltage switchgear, the reactor coolant pump breakers and reactor trip breakers. These will be discussed separately.

- b) Reactor Trip Breakers - As correctly noted by FRC in the DITER, this equipment fails safe (open) upon loss of actuating power. This was also noted by NRC in their review of SER Topic III-5.B, "Pipe Break Outside Containment," transmitted to RG&E by letter dated June 24, 1980 (see Table 1 of that report). It is thus not anticipated that a failure to trip when required will be a concern.

RG&E does not, however, have documentation to definitively demonstrate the functional capability of these trip breakers under HELB conditions. RG&E is thus planning to make an equipment evaluation to determine the potential degradation of this switchgear under such conditions. RG&E does not agree that documentation is required to "... demonstrate equipment functional capability for a time period of one hour plus the length of time it is required to operate." The occurrences of an HELB requiring reactor trip would be detectable by use of Reactor Protection System instrumentation. If automatic tripping did not occur, an operator could trip the electrical bus providing power to the control rods, either from the control room or locally in the turbine building. Upon this action, the reactor will trip, regardless of conditional trip breakers. It is expected that this action could be taken within 5 minutes.

Since the only function of these breakers is to open, and they are designed to fail-open in loss of power, RG&E does not consider the one-hour requirement to be at all appropriate for this situation.





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5G

SYSTEM CONSIDERATION REVIEW

EVALUATION OF LICENSEE STATEMENT

The Licensee has elected to make an equipment evaluation to determine to potential degradation of this equipment under HELB conditions (215°F, 0.8 PSIG, for 30 min.). However, no schedule date has been provided for this corrective action.

The Licensee states that the NRC Criteria concerning 1 hour + function time margin is not applicable to these items. This is not in accordance with NRC Criteria for margin associated with test/analysis (see section 2 of this report).



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

Equipment Item No. 57  
 Medium Voltage Switchgear Located in Turbine Building (A-7)  
 Westinghouse Electric Corporation Model DH-350E 1200-A  
 Controls Power to Reactor Coolant Pump Motors  
 Licensee reference not cited  
 Required Operating Time: Seconds  
 TER Checksheet No. 57  
 Reference 59, Section 4.6.1  
 Licensee Submittal: Page 10 [62]; Table 3, Page 9 [1]; FRC SCEW 68

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

R, (T), Q1, RT, P, H, CS, (A), S, (R), M, I, (QM), RPN, EXN, SEN, (QI), RPS, None,  
 Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 52

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
 X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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

*see pages 4b and 4c*

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 51

LICENSEE RESPONSE TO NRC SER

Item 4.6.1 addresses Medium Voltage switchgear, the reactor coolant pump breakers and reactor trip breakers. These will be discussed separately.

- a) Reactor Coolant Pump Trip Breakers - Appendix E.2 states that the RCP Motors should be maintained operable during a HELB in the turbine building. Actually, the RCS design is such that natural circulation cooling will remove sufficient decay heat. The reactor coolant pumps switchgear provides only one safety-related function - to open and remove power to the pumps in the event of a small cold leg break LOCA. For this particular accident, there will be no adverse environment in the turbine building. Thus, environmental qualification documentation is not required.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

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

— 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.

— 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 not environmentally qualified and can be exposed to a hostile environment simultaneously with the primary equipment.

— 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)

— 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. 57

Reason for Concurrence

- The equipment's accident mitigating function is completed prior to the onset of the hostile environment. No subsequent functions are necessary. See note (1) below. (NRC Qualification Evaluation Category IIIb)
- Other (see page     )
- Resultant NRC Qualification Evaluation Category (IIIa/IIIb)
- Note 1: The Licensee (has/has not) stated that failure of the primary equipment will not affect other safety-related equipment or cause an operator to be misled. (See page     )

Reason for Non-Concurrence

- Although backup equipment is available, it is not technically sound to relinquish defense-in-depth for this function.
- Backup (equipment/system) is not safety-related.
- This equipment is necessary for the operator to ensure an ESF system is performing its intended safety function.
- The rationale presented by the Licensee is not supported by objective technical evidence.
- Other (see page 4b)

LICENSEE STATEMENT

See page 3a of this checksheet.

EVALUATION OF LICENSEE STATEMENT

From a strictly deterministic viewpoint, there is no technical objection to the Licensee's response. TER-C5257-178 never advocated the position that natural circulation cooling was insufficient or that the RCP breakers would fail to perform their trip function in the event of a loss-of-coolant accident (LOCA).

The original concern was that the loss of PCP availability as a consequence of a HELB in the turbine building because of unqualified equipment would too readily relinquish one level of defense-in-depth. It was felt that it was highly desirable to retain a normal cooldown mode in this situation and not to rely on natural circulation cooling, unless necessary. This concern was not addressed in the Licensee's response.



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FRC Project No. C5257  
FRC Assignment No. 13  
FRC Task No. 454

Page  
4c

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 57

SYSTEM CONSIDERATION REVIEW

EVALUATION OF LICENSEE STATEMENT (Continued)

This equipment should remain categorized as requiring environmental qualification until a decision is made by the NRC Staff that qualification is not required.





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58

Equipment Item No. 58  
 I&C Cabinets Located in the Relay Room on Intermediate Level of  
 Control Building (Area #8)  
 Foxboro Co., Model Not Stated  
 Provide Housing for I&C RP Circuits (Plant ID Not Stated)  
 Licensee reference not cited  
 Required Operating Time: Long term  
 TER Checksheet No. 58  
 Reference 59, Section 4.7.13  
 Licensee Submittal: Not Stated; FRC SCEW 59

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,  
 Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 58**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 5B

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59

Equipment Item No. 59  
 Various Relay Racks Located in Relay Room on Intermediate Level of  
 Control Building  
 Westinghouse, Model Not Stated  
 Licensee reference not cited  
 Required Operating Time: Long term  
 TER Checksheet No. 59  
 Reference 59, Section 4.7.13  
 Licensee Submittal: Table 3, Page 10 [1]; FRC SCEW 71

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 59**

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60

Equipment Item No. 60  
 HVAC System Located Outside Containment (Area #8)  
 Westinghouse System Z162  
 Provides HVAC of Control Room Atmosphere (Plant ID Not Stated)  
 Licensee reference not cited  
 Required Operating Time: Long term  
 TER Checksheet No. 60  
 Reference 59, Section 4.7.14  
 Licensee Submittal: Table 3, Page 10 [1]; FRC SCEW 60

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,  
 Not stated, Not applicable deferred

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 60**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                    |                                |
|------------------------------------|--------------------------------|
| I.a Qualified                      | II.c Qualified Life Deficiency |
| I.b Modification                   | III.a Exempt                   |
| II.a Qualification Not Established | <u>III.b</u> 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 \_\_\_\_\_
- 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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

Equipment Item No. 61  
 Cable Splices Located Inside Containment (Area #1)  
 Raychem Co. Type WCSF-N  
 Provide Circuit Continuity (Plant ID Not Stated)  
 Licensee References 25, 35, 574, 2052, and 2099  
 Required Operating Time: Long term  
 TER Checksheet No. 61  
 Reference 59, Section 4.5.2.5  
 Licensee Submittal: Page 9 [62]; Table 3, Page 10 [1]; FRC SCEW 61

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

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

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. GL

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and ~~will~~ will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                                |                                |
|------------------------------------------------|--------------------------------|
| <input checked="" type="radio"/> I.a Qualified | II.c Qualified Life Deficiency |
| I.b Modification                               | III.a Exempt                   |
| II.a Qualification Not Established             | III.b Not in Scope             |
| II.b Not Qualified                             | IV Documentation Not Available |



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

- I.a Equipment Qualified \_\_\_\_\_ 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. 61

LICENSEE RESPONSE TO NRC SER

Item 4.5.2.5 addresses Raychem cable splices located inside containment. The only FRC finding concerned the omission of a qualified life. In fact, RG&E provided a qualified life of 40 years at 91°C, based on reference 2.63. It is not clear what the concern is.

As for the symbiotic classification of the cable and splice sleeves - we consider that this to be inappropriate. The cable and sleeves are purchased separately, and reviewed separately. Qualification documentation can be and should be addressed separately. RG&E notes again that the beta dose rate concerns for the cable goes beyond the DOR Guidelines, and should thus not be discussed in the context of this review, but should be the subject of a separate independent review.



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. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 61

NOTES:

- This equipment item was previously evaluated in Reference 59. See page 1A  
Equipment Item description. -

*The licensee has resolved  
the questions raised in the TER.  
The item is therefore qualified*



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

Equipment Item No. 62 (TMI Action Plan Item)  
 Level Switches Located Inside Containment (Area #1)  
 Gems Corporation, Special Model, Similar to LS-1900  
 Containment Sump "B" Level (LC-942 and -943)  
 Licensee reference not cited  
 Required Operating Time: Not specified  
 TER Checksheet No. 62  
 Reference 59, Section 4.7.11  
 Licensee Submittal: Table 3, Page 10 [1]; FRC SCEW 63

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,  
 Not stated, Not applicable deferred

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
 X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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

See pages 5g and 5f



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

NOTES:

This equipment item was previously evaluated in Reference 59.

*In reference 59 the licensee response was reproduced as follows*

LICENSEE RESPONSE:

Reference 2.52, the specification sheet for this item, was provided to the NRC and FRC on September 24, 1980. There is evidence that these level switches can perform their function in a containment post-accident environment. However, not all of the requirements of the DOR Guidelines are met for this instrumentation. It is important to note, however, that these instruments are not used to perform any post-accident safety-related functions and are not specified for use in the Ginna Emergency Procedures except as confirmatory information. The safety-related function of determining the timing of the "sump switchover" procedure is performed by the RWST level instrumentation, located outside containment.

The TMI Lessons Learned determined that a wide-range sump level indication was to be provided for operator information. Fully qualified equipment will be purchased to meet this requirement. The qualification documentation for this instrumentation will be made available when received.

*The item was deferred as TMI action plan item previously.  
 In reference 60 the licensee stated*

Containment Sump "A" Level - The design analysis for this instrumentation is included.

*Evaluation:*

*It is not possible from the*



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

NOTES:

Review documents, to determine whether:

(1) an additional wide range surp level monitor has been installed and qualification documentation is still to be supplied.

(2) the original equipment evaluated as item 36 in reference 59 has been replaced with qualified equipment and qualification documentation is still to be supplied.

(3) no change in the original installation has been made and the equipment for which there is no qualification documentation is still installed.

Therefore equipment qualification has not been established for this item



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

INSTALLED TMI LESSONS LEARNED IMPLEMENTATION EQUIPMENT SUMMARY

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

This plant is a PWR X, BWR \_\_\_\_.  
 The NSSS Vendor is Westinghouse (W) X, Babcox & Wilcox (B&W) \_\_\_\_,  
 Combustion Engineering (CE) \_\_\_\_, General Electric (GE) \_\_\_\_.

With respect to this equipment item, it is noted (applicable section checked):

- The Licensee does not provide adequate information with respect to identification of TMI Action Plan equipment installed as of 1/1/81.
- The Licensee has not provided the correlation of this equipment item with the specific sections of NUREG-0737. [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and the terminal blocks associated with the device also identified?]
- The Licensee has not provided the approximate installation date for the TMI Action Plan equipment items so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation.
- The Licensee has provided a standard Owners' Group position with respect to a NUREG-0737 technical area.
- The Licensee has requested extensions of implementation dates.
- The Licensee has stated that this equipment item is associated with the following section of NUREG-0737. (This list of applicable NUREG-0737 sections has been identified by NRC as sections within the scope of this review):
  - II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment
  - II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position
  - II.F.1 Containment Water Level Monitor



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

Equipment Item No. 63 (TMI Action Plan Item)  
 Hydrogen Recombiner Igniter Exciter Units Located Inside Containment (Area #1)  
 Westinghouse GLA Part No. 43737, Rev. A  
 Hydrogen Recombination (Plant ID Not Stated)  
 Licensee References 585, 637, and 639  
 Required Operating Time: Long term  
 TER Checksheet No. 63  
 Reference 59, Section 4.7.18  
 Licensee Submittal: Page 14 [62]; Table 3, Page 11 [1]; FRC SCEW 64

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,  
 Not stated, Not applicable deferred

LISTING OF APPLICABLE CHECKSHEETS:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

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

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

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

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

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

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

Corrective action specified by the Licensee:

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

Other (Analyze or replace switch)

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 June 30, 1982.)

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

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

- |                                                      |                                |
|------------------------------------------------------|--------------------------------|
| I.a Qualified                                        | II.c Qualified Life Deficiency |
| <input checked="" type="checkbox"/> 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. 63

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

*Note: The modification necessary is in conjunction with the blower pressure switches which the licensee has committed to replace or analyze the equipment to assure qualification of the overall unit by June 30, 1982.*



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

LICENSEE RESPONSE TO NRC SER

A number of items listed as NRC Category VI, "Equipment for Which Qualification is Deferred," should also be included in this review. The specific items and reasons are given below:

- a) Items 4.7.3 and 4.7.18 address portions of the Hydrogen Recombiner unit. This is a "TMI-related" item; however, deferral of review is not necessary, since the unit is already installed. The FRC review directed that an overall life of the motor should be established, and that a review of the motor's bearing, splices, and lubrication system should be made. Based on the intermittent use of the recombiner, a 40-year life would be expected. However, period maintenance and surveillance, per Reference 72, will account for potential failures, including age-related causes. As for the lead-to-cable splice, Westinghouse has noted that the information in Reference 2.64 is applicable. At the next scheduled refueling shutdown of Spring 1982, RG&E will verify that the proper splice material was used. If not, the splices will be replaced with qualified Raychem sleeves.

FRC also noted additional concerns in item 4.7.18, relative to other recombiner system components. Additional information from Westinghouse states that the ignition lead and thermocouple leads are completely housed in a pressure-tight system with the connections field-brazed. There are no blower damper control solenoids for the RG&E recombiner; the dampers are manually set. Splices have been addressed already. There are no terminal blocks on the RG&E recombiner.

The only items not fully qualified are the Barton pressure switches. Qualification data will be established for these switches, or qualified replacements will be provided by June 30, 1982.





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

NOTES:

1. This TMI Item is addressed in NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short Term Recommendations", Section 2.1.5.c
2. Based on the review of References 585, 637 and 639 in Reference 59, the following is noted:
  - a) Qualification for radiation is adequately demonstrated.
  - b) The Licensee has submitted a drawing from Westinghouse that indicates it is constructed of materials that should not degrade as a result of exposure to the steam/chemical environment of the containment.
3. This equipment item was previously deferred because it is a TMI-Item. The Licensee has stated that there is no need to defer this item because it is already installed.
4. The Licensee has stated that the only item not fully qualified are the Barton pressure transmitters.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

NOTES:

5. The Licensee has committed to analyze or replace the pressure switches that are in question by June 30, 1982, thereby qualifying the igniter exciter unit of the recombiner.
6. Due to the materials of construction and the information presented in the references cited, no qualified life need be established for the igniter. However, an appropriate qualified life estimate for the pressure switches (and any other components susceptible to age-related degradation within the recombiner system) should be determined and this information incorporated into the Licensee's surveillance/maintenance program.
7. Pending the successful resolution of the pressure switches' outstanding item, this equipment is considered qualified.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

INSTALLED TMI LESSONS LEARNED IMPLEMENTATION EQUIPMENT SUMMARY

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

This plant is a PWR X, BWR \_\_\_\_\_.

The NSSS Vendor is Westinghouse (W) X, Babcox & Wilcox (B&W) \_\_\_\_\_,  
 Combustion Engineering (CE) \_\_\_\_\_, General Electric (GE) \_\_\_\_\_.

With respect to this equipment item, it is noted (applicable section checked):

- The Licensee does not provide adequate information with respect to identification of TMI Action Plan equipment installed as of 1/1/81.
- The Licensee has not provided the correlation of this equipment item with the specific sections of NUREG-0737. [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and the terminal blocks associated with the device also identified?]
- The Licensee has not provided the approximate installation date for the TMI Action Plan equipment items so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation.
- The Licensee has provided a standard Owners' Group position with respect to a NUREG-0737 technical area.
- The Licensee has requested extensions of implementation dates.
- The Licensee has stated that this equipment item is associated with the following section of NUREG-0737. (This list of applicable NUREG-0737 sections has been identified by NRC as sections within the scope of this review):
  - II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment
  - II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 63

- \_\_\_ II.E.1.2 (PWR/1-1-81) Auxiliary Feedwater System Automatic Initiation and Flow Indication
- \_\_\_ II.E.3.1 (PWR/1-1-81) Emergency Power Supply for Pressurizer Heaters (Safety-Grade Interfaces)
- \_\_\_ II.E.4.1 (ALL/7-1-81) Dedicated Hydrogen Penetrations
- \_\_\_ II.E.4.2 (ALL/1-1-81) Containment Isolation Dependability
- \_\_\_ II.F.2 (PWR/1-1-81) Instrumentation for Detection of Inadequate Core Cooling
- \_\_\_ II.G.1 (PWR/1-1-81) Emergency Power for Pressurizer Equipment (Safety-Grade Interfaces)
- \_\_\_ II.K.2.10 (PWR/B&W/7-1-81) Safety-Grade Anticipatory Reactor Trip
- \_\_\_ II.K.3.9 (PWR/W/1-1-81) PID Controller Modification (If Hardware Change Involved)
- \_\_\_ II.K.3.12 (PWR/W/1-1-81) Anticipatory Reactor Trip upon Turbine Trip
- \_\_\_ II.K.3.13 (BWR/GE/7-1-81) Separation of HPCI and RCIC Initiation Signals
- \_\_\_ II.K.3.15 (BWR/GE/7-1-81) Prevention of Spurious Isolation of HPCI and RCIC Systems
- \_\_\_ II.K.3.19 (BWR/GE/7-1-81) Interlock on Recirculation Pump Loop
- \_\_\_ II.K.3.21 (BWR/GE/7-1-81) Restart of Core Spray and LPCI Systems (If Hardware Changed Out)
- \_\_\_ II.K.3.27 (BWR/GE/7-1-81) Provide Common Reference Level for Vessel Level Instrumentation (If Hardware Changed Out)

NOTE: This equipment item is addressed in NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations", Section 2.1.5.c



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

Equipment Item No. 64 (TMI Action Plan Item II.D-3)  
 Limit Switch Located Inside Containment (Area #1)  
 NAMCO, Model Not Stated  
 Position Indication for the Pressurizer Safety and Relief Valves  
 (Plant ID Not Stated)  
 Licensee References 2041 and 2795  
 Required Operating Time: Not specified  
 TER Checksheet No. 64  
 Licensee Submittal: Page 1 [65]; FRC SCEW 73

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/~~has not~~) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
- The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action \_\_\_\_\_.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
X = CATEGORY

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

*The submittal does not identify the model number of the installed equipment or the interface seal.*



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NRC Contract No. NRC-03-79-118  
FRC Project No. C5257  
FRC Assignment No. 13  
FRC Task No. 454

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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

Attachment: TMI Equipment Installed and Operable

2. Pressurizer Relief Valve Position Indication - The appropriate portions of the NAMCO limit switch qualification test report are included. The entire report is on file at Ginna.





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.)
<u>EQUIPMENT DESCRIPTION</u>			
Equipment Type	Limit Switch	Limit Switch	
Manufacturer's Name (5.2.2/-/-)	NAMCO	NAMCO	
Model Number (5.2.2/-/-)	NOT STATED	EA-180-11302	} See note (X) 1
Serial Number	NOT STATED	#138-90	
Features/Mounting (5.2.6/-/-)	NOT STATED		
Connections/Interfaces (5.2.6/-/-)	NOT STATED	Internals sealed from environment	See note (X) 3
Location/Elevation	NOT STATED		
Equipment ID No.	NOT STATED	not stated	
<u>QUALIFICATION REPORT</u> (8.0/5.0/5.0)			
Report ID Number	T.R.3613-PP	T.R.3613-PP	See note 2
Report Date	2/15/80	2/15/80	
Issued by	ACME CLEVELAND	ACME CLEVELAND	
Prepared for	NAMCO	NAMCO	
Referenced Reports	NOT STATED	ER-1418	
Qualification Method (5.1, 5.3/2.1, 2.4/2.1, 2.4)	TEST	sequenced TEST	
<u>QUALIFICATION TEST PROGRAM</u>			
Functional Test Description (5.2.5/2.2.9/2.2.9)	Not stated	Trip angle and Torque Test.	
Operating Conditions (-/2.2.10/2.2.10)	Not stated		
Load/Cycles/Voltage/ Current/Freq.	Not stated	Not stated.	



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	not specified	
Accuracy (5.2.5/-/-)	NOT STATED	not specified	
Number of Specimens	NOT STATED	1	
Test Instruments Calibrated	NOT STATED	yes	
Safety Function (Active/ Passive) (-/2.1.3/2.1.3)	Active	active	
Test Duration (5.2.1/-/-)	NOT STATED	30 days	
Accident Duration (Envir. Above Normal) (5.2.1/-/-)	24h	not applicable	
Required Function Time	not stated	not stated	
Test Sequence (General) (5.2.3/2.3.1/2.3.1)	not stated	① thermal aging	
Test Sequence (NUREG-0588, Cat. I) (-/2.3.1/-)		② mechanical wear aging	
1. Representative Sample		③ irradiation	
2. Baseline Data		④ seismic	
3. Performance Extremes		⑤ LOCA	
4. Thermal Aging			
5. Radiation Aging			
6. Wear Aging			
7. Vibration/Seismic			
8. DBE Exposure			
9. Post-DBE Exposure			
10. Inspection			
Aging (5.2.4, 7.0/4.0/4.0)	NOT stated	120°C / 400h.	
Thermal Aging/Basis			
Material Aging Evaluation (7.0/-/-)	not stated	anneals	
Materials Susceptible (Thermal) (5.2.4, 7.0/-/-)	not stated	not stated	
Radiation Aging, Type	Gamma	see accident dose	



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)	< 10 <sup>6</sup> rd	see accident	
Radiation Aging, Dose Rate	< 1 rd/hr.	dose	
Radiation Aging, Method	not stated		
Materials Susceptible (Radiation) (5.2.4, 7.0/-/-)	not stated	not stated	
Operational Aging (-/4.2/-)	not stated	100,200 cycles	
Other Age Conditioning (-/4.2/-)	not stated	not stated	
Qualified Life Claimed/ Established (5.2.4/4.10/-)	plant life	not stated	
Normal Ambient Temperature	60-120°F	not applicable	
Normal Ambient Radiation	< 1 rd/hr		
Normal Ambient Humidity	50% nom.		
On-Going Surveillance and Preventive Maintenance (7.0/-/-)	} Ginna Program } PSR-30	not stated	
On-Going Analysis of Failures and Degradation (7.0/-/-)		not stated	
Margin (General) (6.0/3.0/3.0)	Not applicable		
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. 64

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/0588-I/0588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE NO.)
<u>ACCIDENT CONDITIONS</u>			
LOCA/MSLB/HELB/Uncontrolled (4.1, 4.2, 4.3.1, 4.3.3/ 1.1, 1.2, 1.5/1.1, 1.2, 1.5)	N.A.	N.A.	
Radiation Type	Gamma	Gamma	
Radiation Dose (rd) (4.1.2/1.4/1.4)	1.5X10 <sup>8</sup>	2.04X10 <sup>8</sup> rd	
Radiation Dose Rate (rd/hr) Radiation Qual. Method (5.3.1/-/-)	2.1X10 <sup>4</sup>	9.1X10 <sup>5</sup> rd/h.	
Proximity to Concentrated Radiation (4.1.2/1.4.6/1.4.6)	N.A.	N.A.	
Equipment Susceptible to Beta Radiation (4.1.2/-/-)	NO	Not stated	
Radiation Dose (Normal + Accident) (4.1.2/-/-)	4.6X10 <sup>8</sup> rd	2.04X10 <sup>8</sup> rd	
Plateout Dose Considered (-/1.48/1.48)	NO	Not stated	
Gamma + Beta Dose (rd) (4.1.2/1.4.7/1.4.7)	Not stated	Not stated	



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NRC REQUIREMENTS WITH SECTION REFERENCE (DOR/G588-I/G588-II)	LICENSEE SUBMITTAL	QUALIFICATION DOCUMENTATION	DEFICIENCY (X OR NOTE No.)
<u>ENVIRONMENTAL PROFILE OF ACCIDENT CONDITIONS</u>			
Rate of Temp./Press. Increase	28.6 °F/sec 6 psi/sec	170 K/sec >20 psi/sec.	
Peak: °F/psig/RH/Time	286/60/100/2.7h	340/80-109/100/3h.	
Decrease To: °F/psig/RH/Time	250/20/110/2.7h	320/67/100/3h.	
Decrease To: °F/psig/RH/Time	125/20/110/2.5h	320/40/100/2.5h	
Decrease To: °F/psig/RH/Time		250/25/100/48h.	
Equipment Surface Tempera- ture (MSLB) (-/1.2.5.C, 2.2.6/1.2.5.C, 2.2.6)	Not applicable	not applicable.	
Spray Qualification Method (5.3.2/1.3, 2.2.8/1.3, 2.2.8)	Test	Simultaneous test	
Spray Composition (4.1.4/1.3, 2.2.8/ 1.3, 2.2.8)	Boric acid (2000-3000 ppm Boron) + NaOH - pH 8-10	18 L - H <sub>2</sub> O 311.8g - H <sub>3</sub> BO <sub>3</sub> 150g - NaOH 285.8g - Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	
Spray Density (gpm/ft <sup>2</sup> )	Not stated	0.15 gpm/ft <sup>2</sup>	
Spray Duration	Not stated	5 days	
Submergence Duration (4.1.3/2.2.5/2.2.5)	Not applicable	Not tested	
In-Leakage Considered (5.2.6, 5.3.2/-/-)	Not stated	checked - not detected	
Time to Submergence	Not applicable	Not tested	
Dust Environment (-/2.2.11/2.2.11)	Not stated	Not applicable	



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

NOTES:

Note 1 - Installed equipment model numbers and I.D numbers not provided in licensee submittals.

Note 2 - Partial report supplied for review by Licensee. Since complete report was available review was performed on complete report.

Note 3 - Report clearly states that internals of switch were sealed from environment. Licensee submittal does not identify whether switch is sealed or open to DBE environment.



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 64

INSTALLED TMI LESSONS LEARNED IMPLEMENTATION EQUIPMENT SUMMARY

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

This plant is a PWR , BWR .

The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,  
 Combustion Engineering (CE) , General Electric (GE) .

With respect to this equipment item, it is noted (applicable section checked):

- The Licensee does not provide adequate information with respect to identification of TMI Action Plan equipment installed as of 1/1/81.
- The Licensee has not provided the correlation of this equipment item with the specific sections of NUREG-0737. [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and the terminal blocks associated with the device also identified?]
- The Licensee has not provided the approximate installation date for the TMI Action Plan equipment items so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation.
- The Licensee has provided a standard Owners' Group position with respect to a NUREG-0737 technical area.
- The Licensee has requested extensions of implementation dates.
- The Licensee has stated that this equipment item is associated with the following section of NUREG-0737. (This list of applicable NUREG-0737 sections has been identified by NRC as sections within the scope of this review):
  - II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment
  - II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

Equipment Item No. 65 (TMI Action Plan Item II.D-3)  
 Linear Variable Differential Transformer Limit Switch Located Inside  
 Containment (Area #1)  
 Schaevitz Model 500-HCA  
 Position Indication for the Pressurizer Safety and Relief Valves  
 (Plant ID Not Stated)  
 Licensee Reference 2041  
 Required Operating Time: Not specified  
 TER Checksheet No. 65  
 Licensee Submittal: Page 1 [65]; FRC SCEW 74

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

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

Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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





EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
  - Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
  - Corrective action specified by the Licensee:
    - Equipment replacement with qualified equipment
    - Equipment modification
    - Equipment relocation above submergence level
    - Relocate or shield equipment from radiation source
    - Verify qualification by additional (testing/analysis)
    - Equipment relocation to a mild environment
    - Qualification testing of equipment in progress
    - Other ( \_\_\_\_\_ )
  - The Licensee has provided other information for this equipment item that can be construed as a basis for justification for interim operation.
  - The Licensee (has/has not) provided a schedule for the proposed corrective action. (Schedule for accomplishing the corrective action June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

- |                                                   |                                |
|---------------------------------------------------|--------------------------------|
| I.a Qualified                                     | II.c Qualified Life Deficiency |
| <input checked="" type="radio"/> I.b Modification | III.a Exempt                   |
| II.a Qualification Not Established                | III.b Not in Scope             |
| II.b Not Qualified                                | IV Documentation Not Available |



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 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 \_\_\_\_\_

See page 5f (conclusions)



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

LICENSEE RESPONSE TO NRC SER

Attachment: TMI Equipment Installed and Operable

Pressurizer Safety Valve Position Indication - The Environmental Qualification Report is included.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 65

INSTALLED TMI LESSONS LEARNED IMPLEMENTATION EQUIPMENT SUMMARY

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

This plant is a PWR , BWR .  
 The NSSS Vendor is Westinghouse (W) , Babcox & Wilcox (B&W) ,  
 Combustion Engineering (CE) , General Electric (GE) .

With respect to this equipment item, it is noted (applicable section checked):

- The Licensee does not provide adequate information with respect to identification of TMI Action Plan equipment installed as of 1/1/81.
- The Licensee has not provided the correlation of this equipment item with the specific sections of NUREG-0737. [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and the terminal blocks associated with the device also identified?]
- The Licensee has not provided the approximate installation date for the TMI Action Plan equipment items so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation.
- The Licensee has provided a standard Owners' Group position with respect to a NUREG-0737 technical area.
- The Licensee has requested extensions of implementation dates.
- The Licensee has stated that this equipment item is associated with the following section of NUREG-0737. (This list of applicable NUREG-0737 sections has been identified by NRC as sections within the scope of this review):
  - II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment
  - II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position



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 1a

EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

Equipment Item No. 66 (TMI Action Plan Item II.B.1)  
 Solenoid Valves Located Inside Containment (Area #1)  
 Valcor Engineering Corp., Model Not Stated  
 Reactor Vessel Head Vent (Plant ID Not Stated)  
 Licensee References 1547, 1568, 1569, 1801, 1835, 2796, 2797, 2798, 2799,  
 2800, and 2801  
 Required Operating Time: Long term  
 TER Checksheet No. 66  
 Licensee Submittal: Page 1 [65]; FRC SCEW 66

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

R, T, Q1, RT, P, H, CS, A, S, (R), M, I, QM, RPN, EXN, SEN, QI, RPS, None,  
 Not stated, Not applicable

LISTING OF APPLICABLE CHECKSHEETS:

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



**EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66**

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

- The Licensee (has/has not) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/has not) proposed a corrective action for this equipment item whose qualification has not been fully established.
  - Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
  - Corrective action specified by the Licensee:
    - Equipment replacement with qualified equipment
    - Equipment modification
    - Equipment relocation above submergence level
    - Relocate or shield equipment from radiation source
    - Verify qualification by additional (testing/analysis)
    - Equipment relocation to a mild environment
    - Qualification testing of equipment in progress
    - Other ( \_\_\_\_\_ )
  - 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                   |
| <b>(II.a) Qualification Not Established</b> | III.b Not in Scope             |
| II.b Not Qualified                          | 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 X
- Aging Degradation Evaluated Adequately \_\_\_\_\_
- Qualified Life or Replacement Schedule Established (If Required) \_\_\_\_\_
- Program Established to Identify Aging Degradation \_\_\_\_\_
- Criteria Regarding Aging Simulation Satisfied (If Required) \_\_\_\_\_
- Criteria Regarding Temperature/Pressure Exposure:
  - o Peak Temperature Adequate \_\_\_\_\_
  - o Peak Pressure Adequate \_\_\_\_\_
  - o Duration Adequate \_\_\_\_\_
  - o Required Profile Enveloped Adequately \_\_\_\_\_
  - o Steam Exposure (If Required) Adequate \_\_\_\_\_
- Criteria Regarding Spray Satisfied \_\_\_\_\_
- Criteria Regarding Submergence Satisfied \_\_\_\_\_
- Criteria Regarding Radiation Satisfied \_\_\_\_\_
- Criteria Regarding Test Sequence Satisfied \_\_\_\_\_
- Criteria Regarding Test Failures or Severe Anomalies  
 (If Any) Satisfied \_\_\_\_\_
- Criteria Regarding Functional Testing Satisfied \_\_\_\_\_
- Criteria Regarding Instrument Accuracy Satisfied \_\_\_\_\_
- Test Duration Margin (1 hour + Function Time) Satisfied \_\_\_\_\_
- Criteria Regarding Margins Satisfied (NUREG-0588, Cat. I) \_\_\_\_\_

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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





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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

INSTALLED TMI LESSONS LEARNED IMPLEMENTATION EQUIPMENT SUMMARY

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

This plant is a PWR X, BWR \_\_\_\_\_.

The NSSS Vendor is Westinghouse (W) X, Babcox & Wilcox (B&W) \_\_\_\_\_,  
Combustion Engineering (CE) \_\_\_\_\_, General Electric (GE) \_\_\_\_\_.

With respect to this equipment item, it is noted (applicable section checked):

- \_\_\_ The Licensee does not provide adequate information with respect to identification of TMI Action Plan equipment installed as of 1/1/81.
- \_\_\_ The Licensee has not provided the correlation of this equipment item with the specific sections of NUREG-0737. [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and the terminal blocks associated with the device also identified?]
- \_\_\_ The Licensee has not provided the approximate installation date for the TMI Action Plan equipment items so that the appropriate qualification criteria (REG-0588 or DOR Guidelines) can be used in the EEQ evaluation.
- \_\_\_ The Licensee has provided a standard Owners' Group position with respect to a NUREG-0737 technical area.
- \_\_\_ The Licensee has requested extensions of implementation dates.
- X The Licensee has stated that this equipment item is associated with the following section of NUREG-0737. (This list of applicable NUREG-0737 sections has been identified by NRC as sections within the scope of this review):
  - \_\_\_ II.B.3 (ALL/1-1-81) Post-Accident Sampling Capability of Reactor Coolant and Containment
  - \_\_\_ II.D.3 (ALL/1-1-81) Direct Indication of Relief and Safety Valve Position



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 66

- II.E.1.2 (PWR/1-1-81) Auxiliary Feedwater System Automatic Initiation and Flow Indication
- II.E.3.1 (PWR/1-1-81) Emergency Power Supply for Pressurizer Heaters (Safety-Grade Interfaces)
- II.E.4.1 (ALL/7-1-81) Dedicated Hydrogen Penetrations
- II.E.4.2 (ALL/1-1-81) Containment Isolation Dependability
- II.F.2 (PWR/1-1-81) Instrumentation for Detection of Inadequate Core Cooling
- II.G.1 (PWR/1-1-81) Emergency Power for Pressurizer Equipment (Safety-Grade Interfaces)
- II.K.2.10 (PWR/B&W/7-1-81) Safety-Grade Anticipatory Reactor Trip
- II.K.3.9 (PWR/W/1-1-81) PID Controller Modification (If Hardware Change Involved)
- II.K.3.12 (PWR/W/1-1-81) Anticipatory Reactor Trip upon Turbine Trip
- II.K.3.13 (BWR/GE/7-1-81) Separation of HPCI and RCIC Initiation Signals
- II.K.3.15 (BWR/GE/7-1-81) Prevention of Spurious Isolation of HPCI and RCIC Systems
- II.K.3.19 (BWR/GE/7-1-81) Interlock on Recirculation Pump Loop
- II.K.3.21 (BWR/GE/7-1-81) Restart of Core Spray and LPCI Systems (If Hardware Changed Out)
- II.K.3.27 (BWR/GE/7-1-81) Provide Common Reference Level for Vessel Level Instrumentation (If Hardware Changed Out)

II.B.I



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

Equipment Item No. 67  
 Pressure Transmitters Located in Auxiliary Building  
 ITT-Barton Model 332  
 Containment Pressure Transmitters (Plant ID Not Stated)  
 Licensee Reference 567  
 Required Operating Time: Long term  
 TER Checksheet No. 67  
 Reference 59, Section 4.5.2.1  
 Licensee Submittal: Page 13 [62]; Table 3, Page 7 [1]; FRC SCEW 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:

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

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

- The Licensee (has/~~has not~~) provided a response to the SER concerns.
- The Licensee (has/has not) specifically stated that the equipment is qualified and/or will function when exposed to the applicable DBE environmental service conditions.
- The Licensee has presented information which shows there are no outstanding qualification deficiencies.
- The Licensee (has/~~has not~~) proposed a corrective action for this equipment item whose qualification has not been fully established.
- Justification for interim operation (has/has not) been provided by the Licensee for this equipment item.
- Corrective action specified by the Licensee:
  - Equipment replacement with qualified equipment
  - Equipment modification
  - Equipment relocation above submergence level
  - Relocate or shield equipment from radiation source
  - Verify qualification by additional (testing/analysis)
  - Equipment relocation to a mild environment
  - Qualification testing of equipment in progress
  - Other ( \_\_\_\_\_ )
- 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 June 30, 1982.)
- The Licensee states that the equipment item does not require qualification and/or should be exempted from environmental qualification.

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

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



EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 62

EQUIPMENT ENVIRONMENTAL QUALIFICATION SUMMARY FORM

NRC REQUIREMENTS

DESIGNATION:  
 X = DEFICIENCY

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

NRC QUALIFICATION CATEGORY

DESIGNATION:  
 X = CATEGORY

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

This equipment item was previously evaluated in Reference 59. See page 1A Equipment Item description.



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EQUIPMENT ENVIRONMENTAL QUALIFICATION REVIEW OF EQUIPMENT ITEM NO. 67

LICENSEE RESPONSE TO NRC SER

Item 4.6.8 addresses the containment pressure transmitters located in the intermediate building. The five transmitters being replaced are those located in the auxiliary building, where the potential for higher radiation levels as a result of post-LOCA sump recirculation dictated their replacement. The intermediate building will not experience a harsh environment for an HELB inside containment, which is the only time these transmitters are required to operate. Although they would see a harsh environment as the result of an HELB in the intermediate building, they have no function to perform during such an event. It is thus considered that these two transmitters need only function in a "mild" environment.

## 5. CONCLUSIONS

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

Although Sections 4.3, 4.4, and Appendix C of this report present a detailed evaluation of (1) the Licensee's qualification methodology, (2) the equipment environmental qualification of each equipment item, and (3) the Licensee's response to the NRC SER, it is appropriate to highlight for the Licensee and the NRC certain conclusions and concerns reached as a result of the review which require special attention. These concerns are summarized below.

With regard to Equipment Item No. 17 (MOV-878A, -878C), the Licensee has stated that these valves (SI to RCS hot legs) are locked closed with power removed and are therefore exempt from qualification.

It is apparent that the FSAR assumes availability of hot leg injection points. In fact, it appears that, with both hot leg injection valves disabled closed and a broken cold leg injection line, the system is reduced from three pumps discharging to four lines to one pump discharging to one line (the other two pumps pumping out the break). At this point, a single-active failure to the appropriate pump would cause all safety injection flow to be interrupted until certain motor-operated valves (such as MOV-871A and 871B) could be realigned to redirect the discharge of one of the operable pumps from the broken cold leg line to the intact line.



It is not apparent why valves 878A and 878C have been locked closed. It is possible that plant modifications may have been made after the FSAR was written that justify the Licensee's position. The Licensee should either provide further clarification on this issue or qualify the subject valve actuators for the post-accident environment.

With regard to Equipment Item No. 57 (reactor coolant pump trip breakers), the evaluation presented in TER-C5257-178, Section 4.6.2 and Appendix E.2, concluded that this equipment should be environmentally qualified to remain functional during a main steam line break (MSLB) or main feedwater line break (MFLB) in the turbine building. The Licensee did not adequately respond to this concern. It is highly desirable to retain a normal cooldown mode in this situation, and the Licensee should not rely on natural circulation cooling. This equipment should remain categorized as requiring environmental qualification.

Finally, the Licensee stated in its response [62] to the NRC SER:

"The attached information responds to all open items identified in the SER and TER, except for deferred 'mild environment' and 'TMI-related' equipment.

For certain items, qualification information is still being developed. In those cases, a commitment is made to complete the evaluation/qualification of this equipment by June 30, 1982. Rationale for acceptability of the use of the installed equipment in the interim is also provided. It must be pointed out, however, that the June 30, 1982 date may not be achievable for all modifications. Equipment procurement and delivery schedules, testing requirements, and installation delays (especially as related to scheduled refueling shutdowns) may require a delay in the installation of certain modifications. Another major source of delay results from new issues, which we consider go beyond the DOR Guidelines, brought up in the SER/TER. These issues include the additional containment temperature margin requirements, the dose rate concern presented in Appendix H of the TER, and the complete resolution of the aging/qualified life concerns. Specific comments are provided in the attachments to this letter. Finally, a resolution of disagreements between RG&E and FRC/NRC relative to system operational considerations (see Appendix E of the TER) is required."

## 6. REFERENCES

The references listed in this section of the report were used to develop the Equipment Environmental Qualification evaluation for this plant. The references have been separated into two lists: (1) Plant-Specific References and (2) Plant Generic References. All non-generic documents are listed on the "Plant-Specific References" list. All qualification documents that could be applicable to equipment installed in several plants were listed on the "Plant Generic References" list. These documents include topical reports, test reports, component and material analyses, etc. cited by the Licensee as evidence of qualification in accordance with the documentation reference instructions established by IE Bulletin 79-01B. Since these documents were compiled by a computer data base, the citation numbering was computer generated and the same document has the same generic reference number in all Technical Evaluation Reports prepared under this equipment qualification program.

Throughout the text of the report, references are designated by a bracketed number; the reference numbers are not presented in sequential order.

## PLANT-SPECIFIC REFERENCES

1. J. E. Maier  
Letter to D. G. Eisenhut, NRC. Subject: Transmittal  
of RG&E Report on Environmental Qualification of  
Electrical Equipment of R. E. Ginna Power Plant  
Rochester Gas & Electric, 31-Oct-80
2. O. R. Martins  
Specifications for Standby AFW Pumps  
Gilbert Associates, 20-Sep-74  
SP-520-044666-000
3. Preliminary Specification for Electric Motors To Be  
Supplied with Standby AFW Pumps  
Gilbert Associates, 06-Sep-74  
P-SP-711-044666-000
4. Specifications for Large Motors  
Gilbert Associates, 29-Mar-67  
SP-5201, Rev. 5
5. Specification for Heating, Ventilating, and  
Cooling Systems  
Gilbert Associates, 05-Apr-67  
SP-5342
6. Specifications for Emergency Diesel Engine-Generator  
Sets  
Gilbert Associates, 25-Nov-66  
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7. Specifications for Motor Driven Auxiliary  
Feedwater Pumps  
Gilbert Associates, 22-Dec-66  
RO-2267
8. Specifications for D.C. Power and  
Control Batteries  
Gilbert Associates, 16-Jun-67  
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9. Specifications for Cable Insulation,  
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IPCEA, 00-Aug-74  
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10. J. B. Gardner  
Memo, Subject: Tests on Kerite Cables  
Kerite Co., 22-Jul-68
11. NEMA Standards for Low Voltage Power Circuit  
Breakers  
NEMA, 14-Feb-75  
SG 3-1975
12. Specifications for Motor Operated Valves  
Westinghouse, 23-May-66  
G-676258
13. Specifications for Control Valves  
Westinghouse, 08-Mar-66  
G-676270
14. Specifications for Auxiliary Pumps  
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15. Specification for Auxiliary Pump Motors  
Westinghouse, 23-Nov-66  
G-676427
16. A. P. Colaiaco  
Letter to E. M. Hoellen. Subject: Terminal Blocks and  
Switchgear; with Attachment  
Westinghouse, 6-Feb-78
17. Specifications for Solenoid Valves  
Copes-Vulcan
18. Specification Sheet for Solenoid Valves  
R. G. Laurence Co.  
1100 & 1200
19. Vendor Data Sheet for Solenoid Valves  
Versa Valves
20. S. A. Hunt  
Specification for Containment Structure Electrical  
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Gilbert Associates, 09-Aug-74  
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21. Technical Proposal for the Electrical Penetration  
for the Ginna Station Containment Structure  
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## APPENDIX A - ENVIRONMENTAL SERVICE CONDITIONS

This appendix contains a summary of the information concerning expected environmental service conditions in various locations within the plant (see Figure A-1), as provided in Reference 1. Based on these considerations, each equipment item was evaluated with respect to the environmental service conditions presented in this appendix.

Environment 1 - Inside Reactor ContainmentNormal Operation

Temperature	60-120°F
Pressure	0 psig
Humidity	50% (nominal)
Radiation	< 1 rd/h (can be higher or lower near specific equipment items)

Accident Conditions

For PWR plants, the Guidelines (Section 4) 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 the Ginna plant satisfies these criteria. The environmental conditions resulting from a feedline break are less severe than those from the MSLB.

The environmental parameters used for the assessment of qualification of equipment inside containment are:

Temperature and Pressure	Figure A-2*
Humidity	100% (nominal)
Spray	Solution of boric acid (2000 to 3000 ppm of boron) plus sodium hydroxide in water. Solution pH between 8 and 10.

\*The calculated "worst-case" peak pressure is less than 53 psig and falls to 0 at about 8.3 hours. The duration of the temperature profile was extended to include the data provided in Reference 74 (see discussion on Page A-2).

Integrated Radiation Dose  
in Atmosphere  
Flooded Depth [62]

Figure A-3

242 ft 8 in elev.

In Reference 74, the Licensee transmitted to the NRC an updated evaluation of the pressure and temperature conditions which would result from a LOCA or steam line break inside containment. The Licensee recommended that the LOCA temperature be revised to show a value of 250°F between 10,000 seconds and 20,000 seconds rather than the values shown on Figure A-2. Beyond 20,000 seconds, the Licensee recommended a temperature of less than 100°F. The Licensee also provided its results of the main steam line break analysis inside containment [74]; Figures A-4, A-5, A-6, and A-7 show the results of the analysis contained in Reference 74. The Licensee stated the following:

"We conclude that the temperature resulting from a steam line break in containment may exceed the Ginna design basis temperature profile, but that this is of no consequence due to the short duration of this exceedance and may therefore be ignored. This conclusion is based on NRC guidance provided in the Division of Operating Reactors (DOR) Guidelines which in turn is based, for example, on the short duration of the temperature spike, lower heat transfer coefficient, and the evaluation of the steam lines relative to equipment. Thus, we conclude that the Ginna design basis temperature profile, as revised based on LOCA results discussed above, remains valid."

#### Environment 2 - Auxiliary Building

##### Normal Operation

Temperature	50-104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation Dose Rate	< 10 mR/h (areas near RHR piping, < 100 mR/h when RHR system is in operation)

##### Accident Conditions

Temperature	50-104°F (122°F near motors)
Pressure	0 psig
Humidity	60% (nominal)

## Radiation

Operating Floor (271 ft elev.)  
 Near Bus 14 and MCC 1C & 1L:  
 100 rd  
 Other Areas: < 50 rd  
 Intermediate Floor (253 ft elev.)  
 Near Bus 16 and MCC 1D & 1M:  
 900 rd  
 Other Areas: < 500 rd  
 Basement Floor (236 ft elev.)  
 Near CS, RHR, and SI pumps and  
 associated piping: 2.8 Mrd  
 Other areas: < 0.01 Mrd

Environment 3 -- Intermediate Building and Cable TunnelNormal Operation

Temperature	50-104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation Dose Rate	< 1 mR/h (higher near reactor coolant sampling lines)

Accident ConditionsBased Upon HELB or MSLB

Temperature	215°F for 30 min; then 104°F within 3 h and indefinitely thereafter
Pressure	0.8 psig for 30 min; then 0 psig within 3 h and indefinitely thereafter
Humidity	100% indefinitely
Flooded Depth	0 ft

Based Upon LOCA Conditions

Temperature	115°F (estimated) near large motors and FW and SL piping; 104°F in open areas
Pressure	0 psig
Humidity	100%
Radiation	Negligible
Flooded Depth	0 ft

Environment 4 - Diesel Generator RoomsNormal Operation

Temperature	60-104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation Dose Rate	Negligible

Accident Conditions

Temperature	< 104°F
Pressure	0 psig
Humidity	90% (estimated)
Radiation	Negligible
Flooded Depth	0 ft for both rooms simultaneously (Flooding of one room to approx. 1-ft depth could occur)

Environment 5 - Screen HouseNormal Operation

Temperature	50-104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation Dose Rate	Negligible

Accident Conditions

Temperature	< 104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation	Negligible
Flooded Depth	1.5 ft

Environment 6 - Auxiliary Building AdditionNormal Operation

Temperature	60-120°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation Dose Rate	Negligible

Accident Conditions

Temperature	60-120°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation	Negligible
Flooded Depth	Approx. 2 ft

Environment 7 - Turbine BuildingNormal Operation

Temperature	50-104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation Dose Rate	Negligible

Accident Conditions

Temperature	220°F for 30 min; then decreasing to 100°F within 3 h
Pressure	1.14 psig on mezzanine and basement levels; 0.7 psig on operating floor
Humidity	100%
Radiation	Negligible
Flooded Depth	1.5 ft in basement

Environment 8 - Relay Rooms and Battery RoomsNormal Operation

Temperature	50-104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation Dose Rate	Negligible

Accident Conditions

Temperature	< 104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation	Negligible



Environment 9 - Mechanical Equipment RoomNormal Operation

Temperature	50-104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation Dose Rate	Negligible

Accident Conditions (HELB)

Temperature	< 104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation	Negligible
Spray	None
Flooded Depth	Approx. 3 ft

Environment 10 - Control RoomNormal Operation

Temperature	50-104°F (usually maintained at 70-78°F)
Pressure	0 psig
Humidity	60% (nominal)
Radiation Dose Rate	Negligible

Accident Conditions

Temperature	104°F
Pressure	0 psig
Humidity	60% (nominal)
Radiation	Negligible

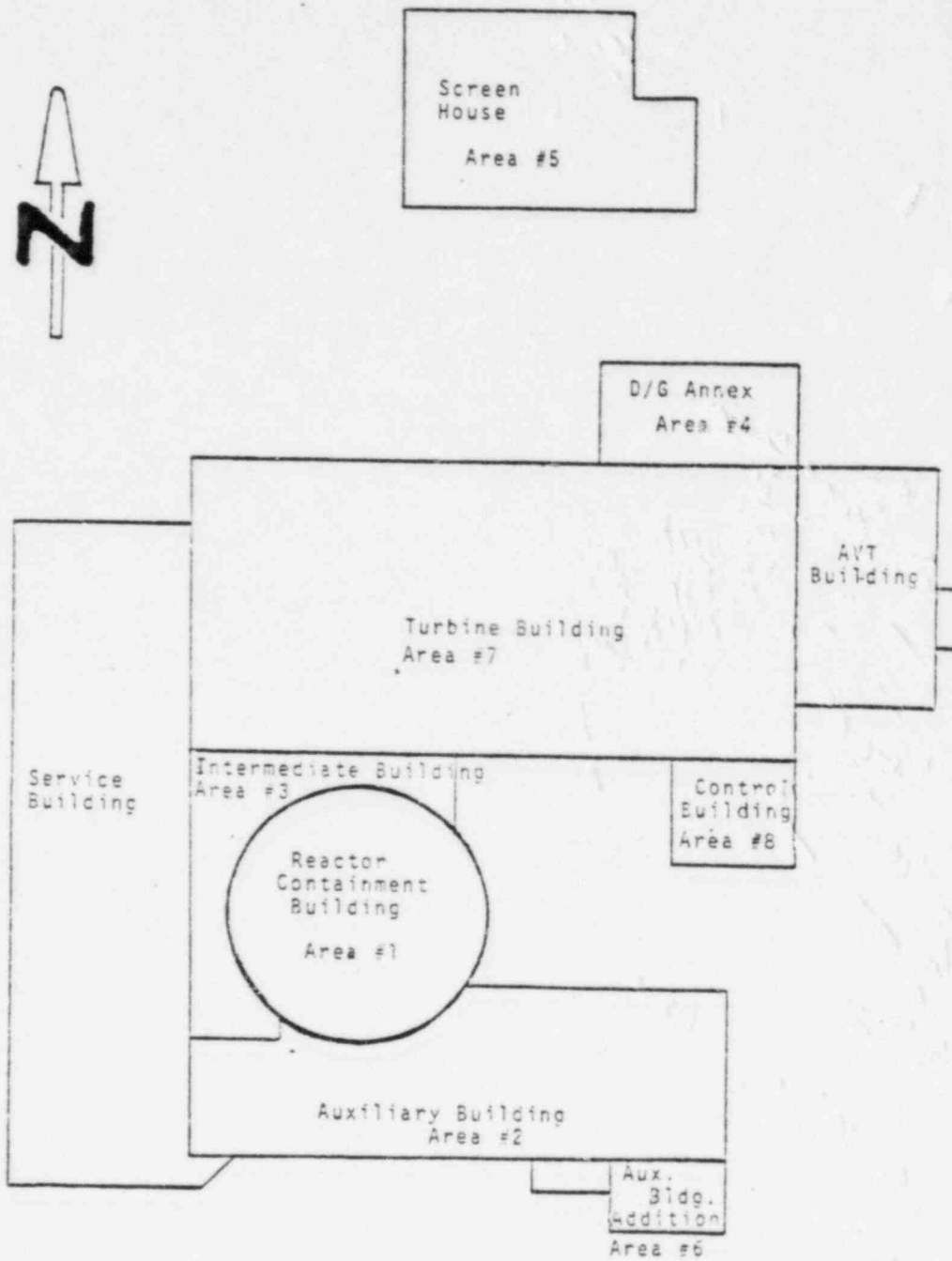
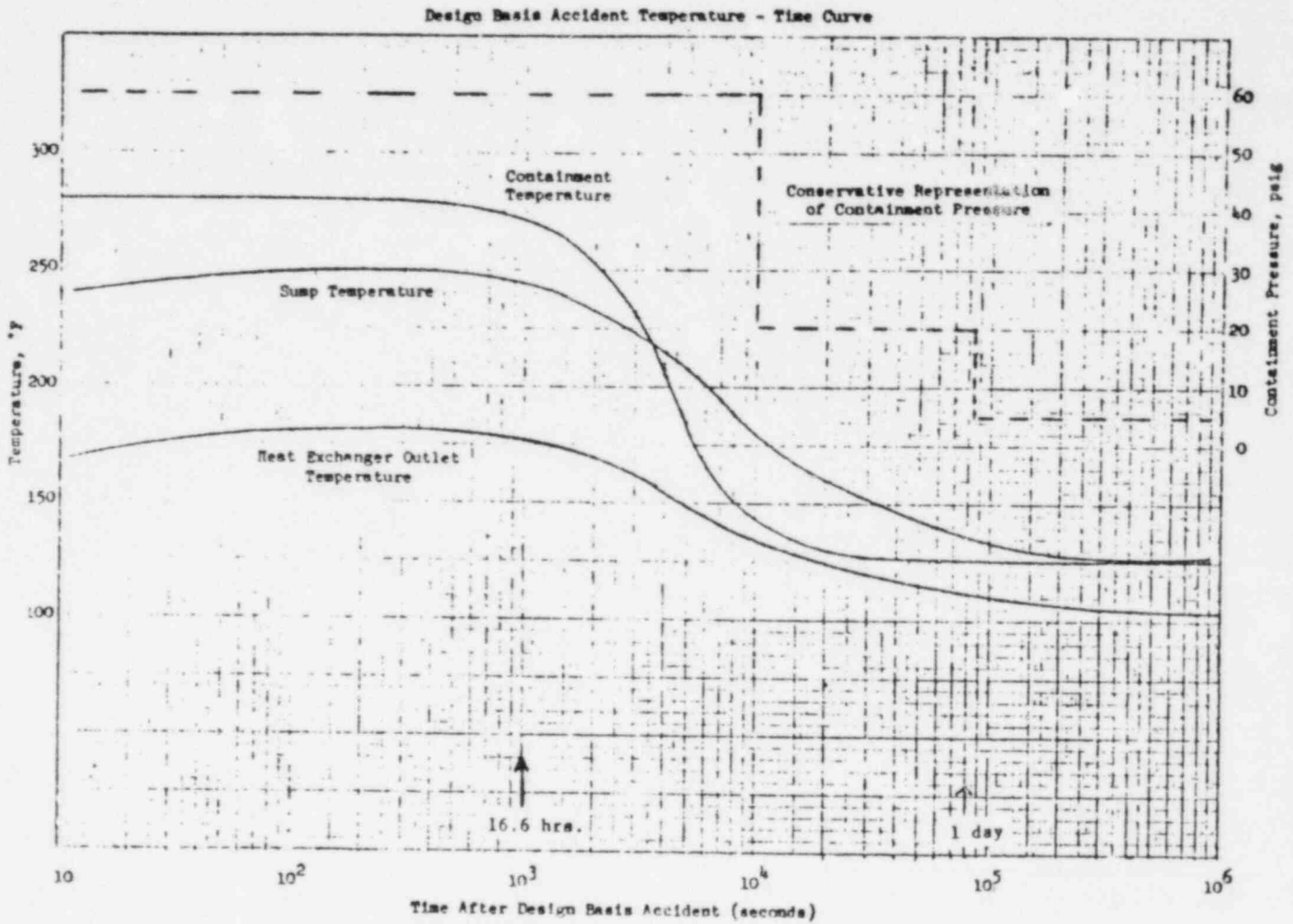


Figure A-1. Identification of Individual Buildings and Specific Areas at Ginna Plant [1]

**FIGURE SUPPLIED  
BY THE LICENSEE**



**FIGURE SUPPLIED  
BY THE LICENSEE**

Figure A-2. Design Basis Accident Temperature and Pressure as Functions of Time [1]

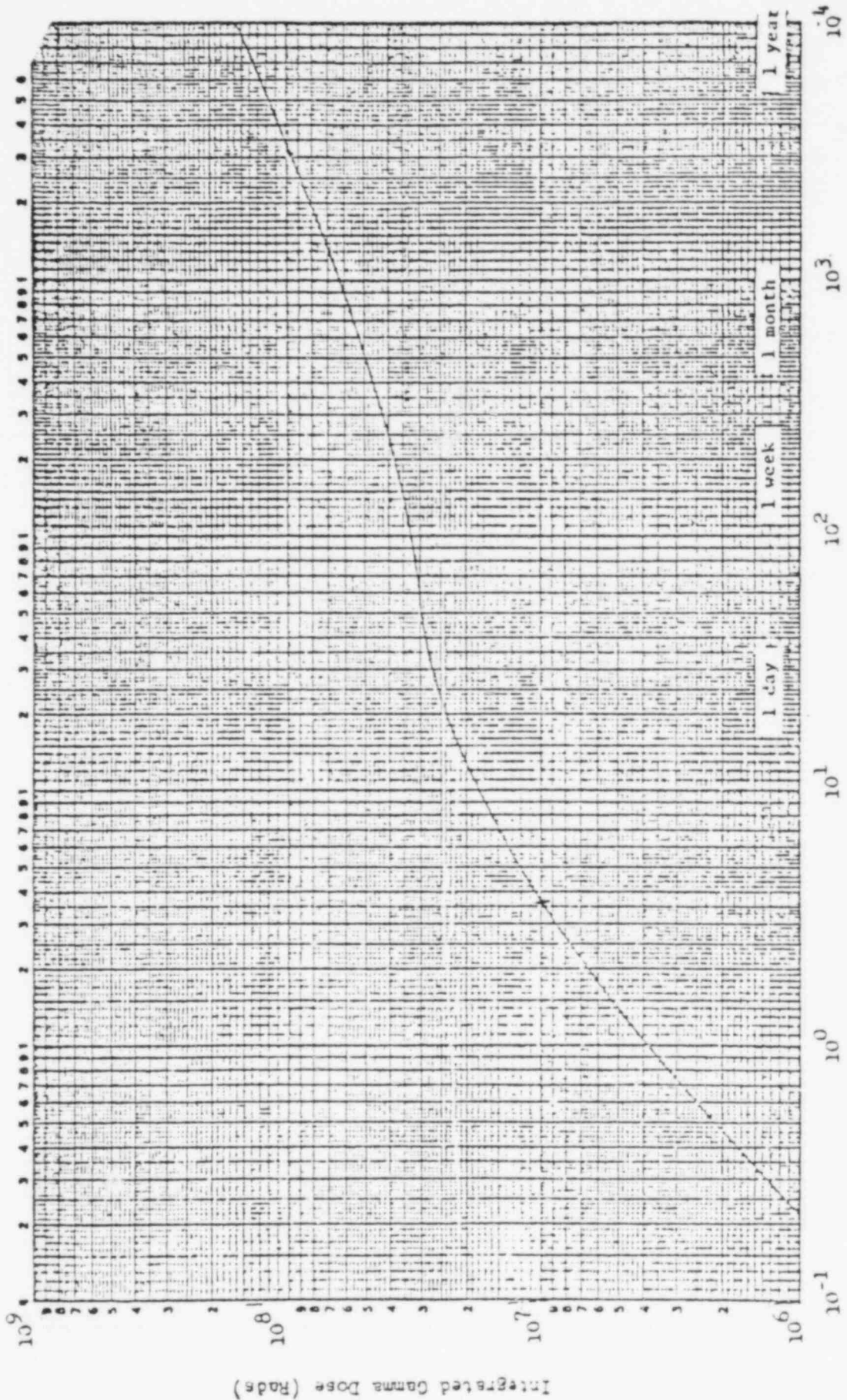


Figure A-3. Containment Atmosphere Integrated Gamma Dose (1)

FIGURE SUPPLIED  
BY THE LICENSEE

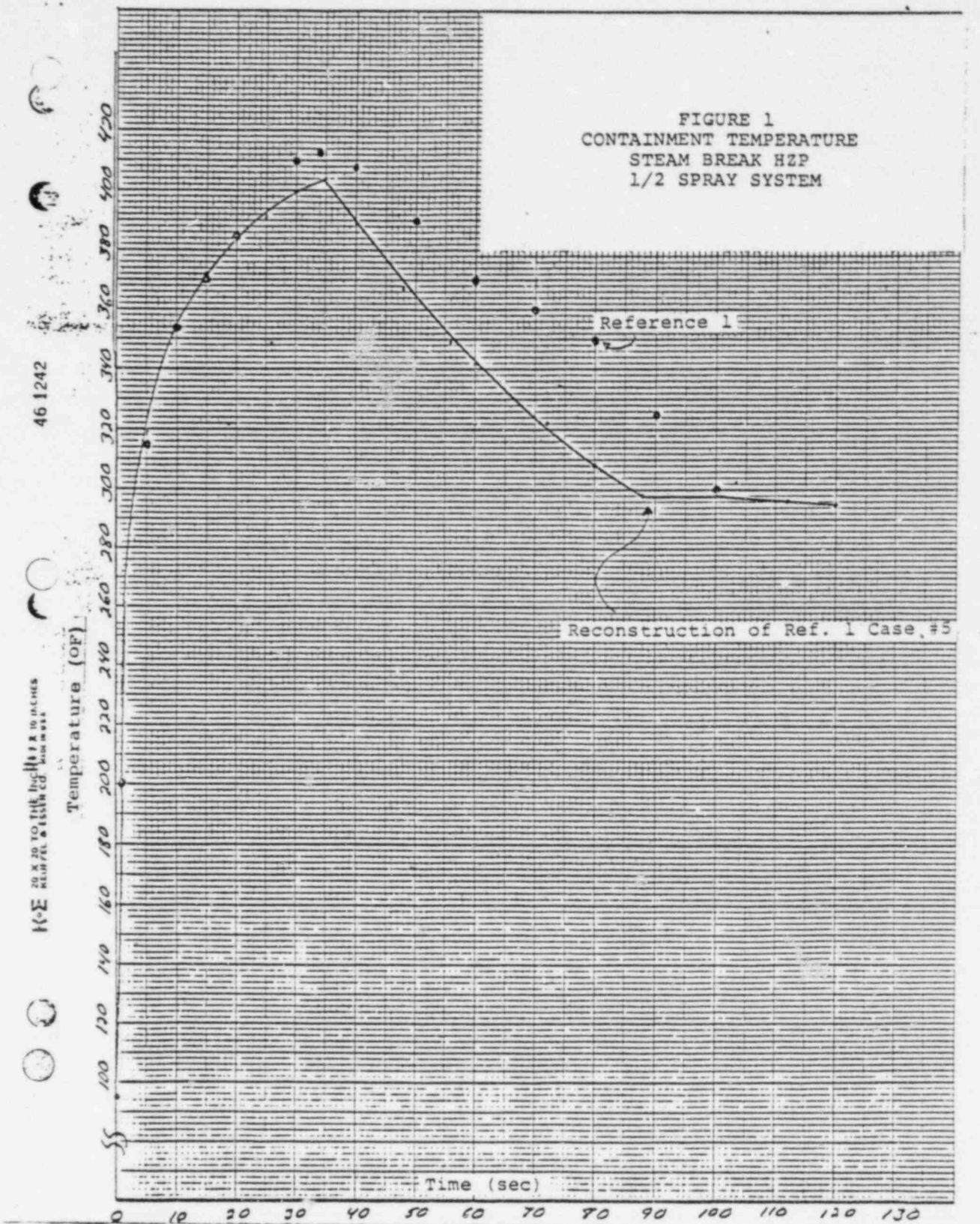


Figure A-4. Containment Temperature Steam Break HZP 1/2 Spray System

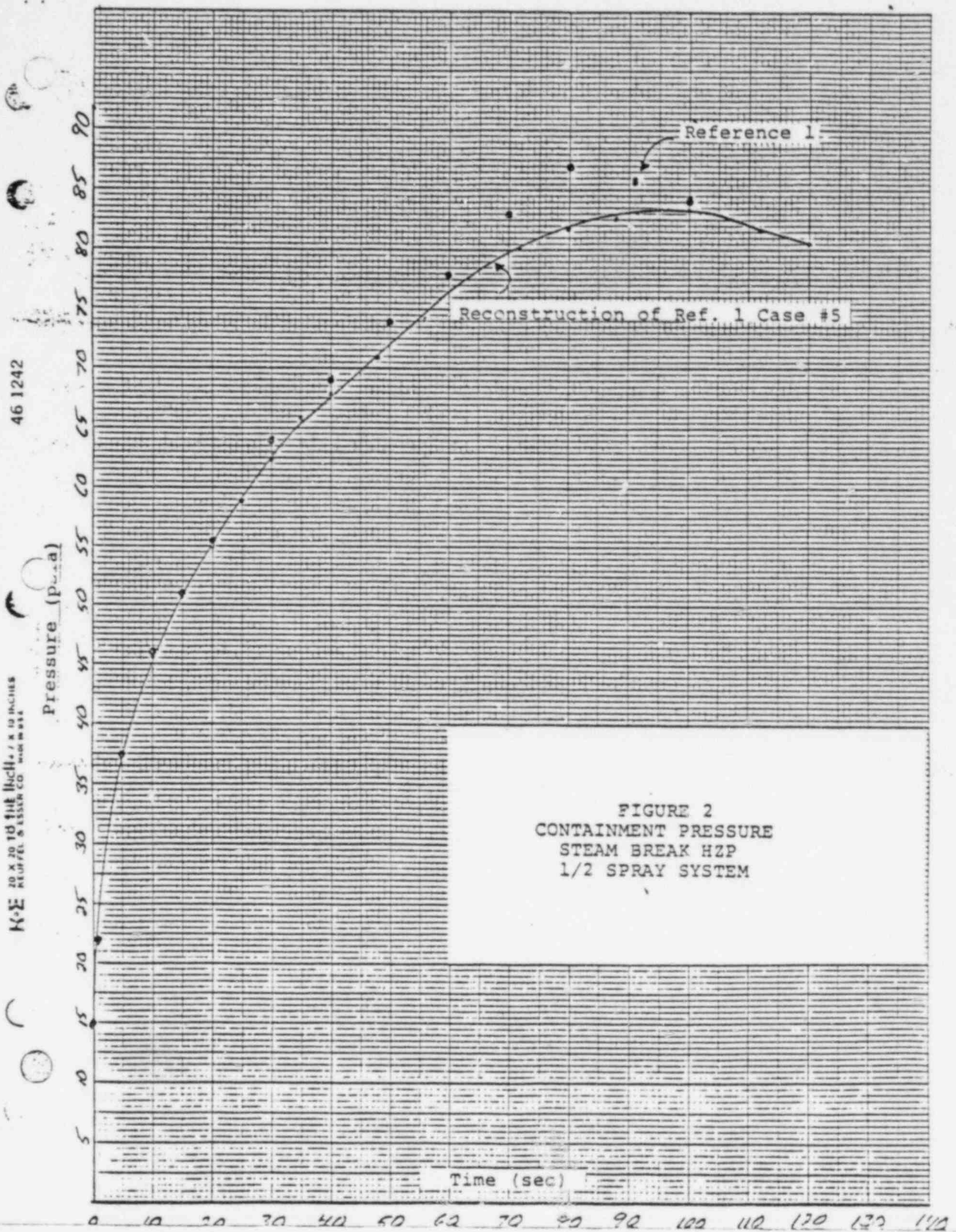


Figure A-5. Containment Pressure Steam Break HZP 1/2 Spray System

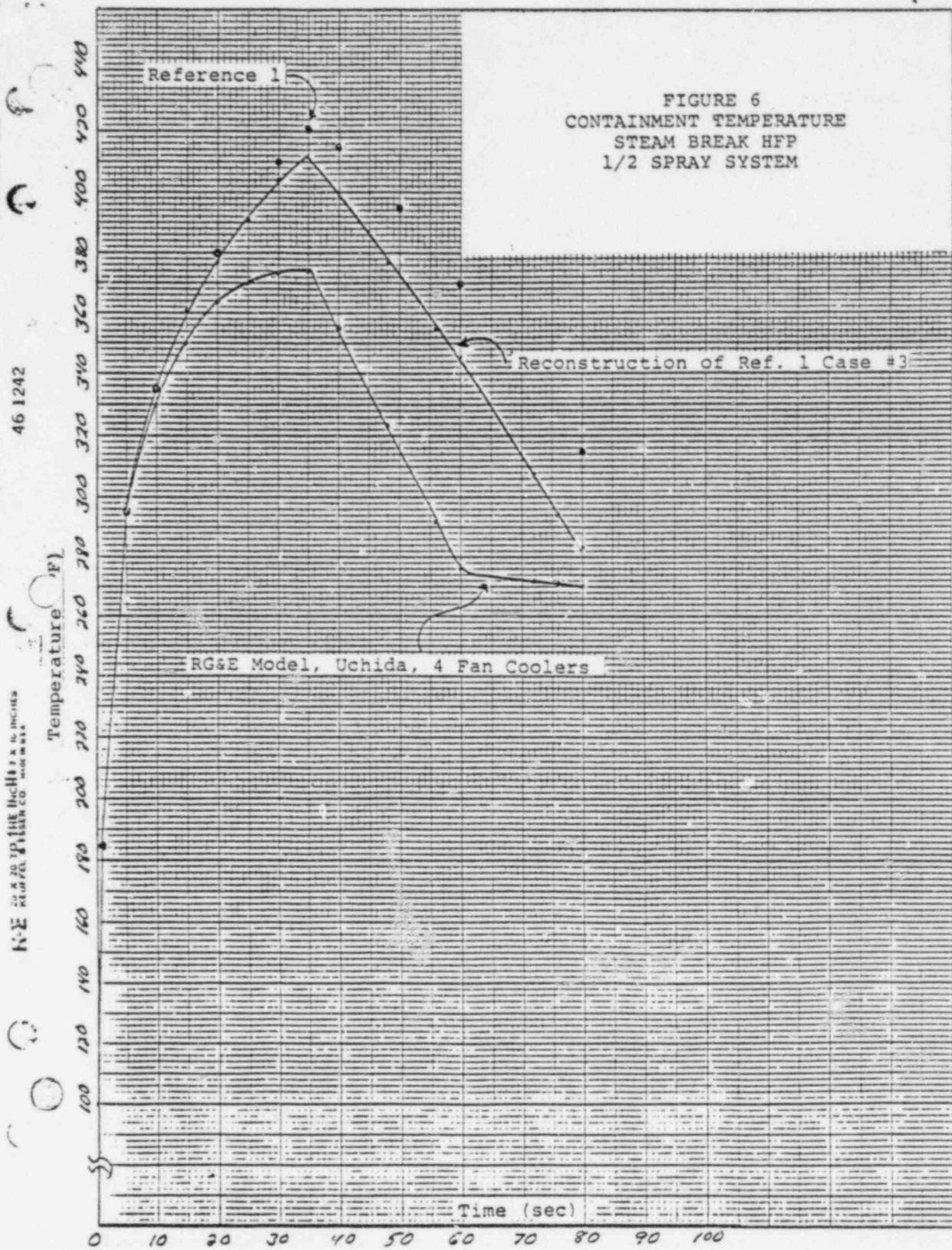


Figure A-6. Containment Temperature Steam Break HFP 1/2 Spray System

FIGURE 7  
CONTAINMENT PRESSURE  
STEAM BREAK HFP  
1/2 SPRAY SYSTEM

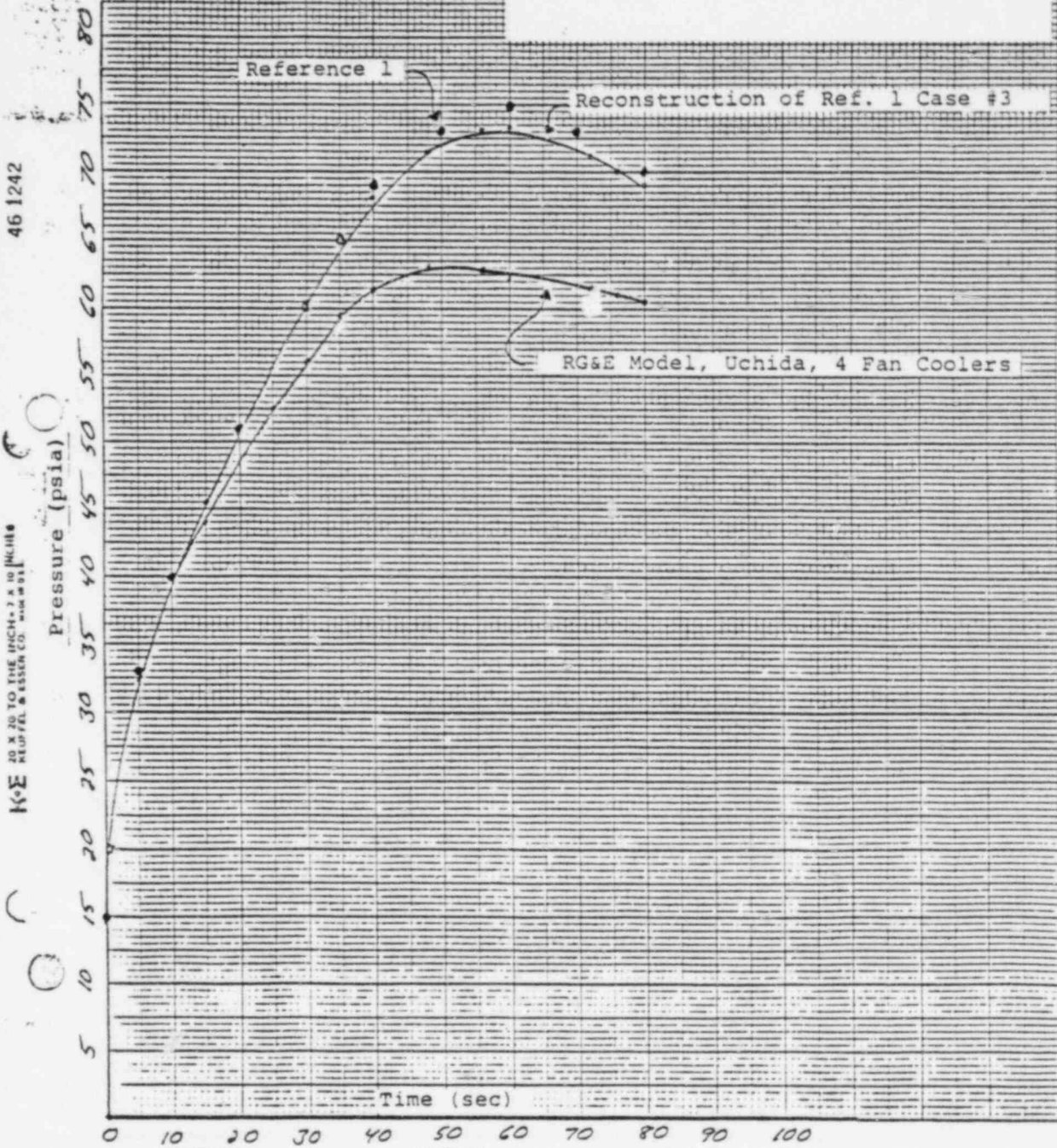


Figure A-7. Containment Pressure Steam Break HFP 1/2 Spray System



## APPENDIX B - LISTING OF SAFETY-RELATED ELECTRICAL EQUIPMENT

The following table lists the groupings of safety-related electrical equipment items for the R. E. Ginna Station. Equipment items provided in the table are used in the detailed equipment environmental qualification evaluation presented in Section 4.4 and summarized in Section 4.2. This table was generated from the lists of equipment provided by the Licensee [1,62].

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

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

## Equipment Item No. 2

Solenoid Valves Located in Turbine Building (Area #7)

Automatic Switch Co. (ASCO) Model LB8300B64RU

Actuates Feedwater Bypass Valves (V-4271, V-4272)

Licensee Reference 1617

Required Operating Time: Short term (SI signal)

TER Checksheet No. 2

Reference 59, Section 4.5.2.6

Licensee Submittal: Page 9 [62]; Table 3, Page 1 [1]; FRC SCEW 2

## Equipment Item No. 3

Solenoid Valves Located in Auxiliary Building (Area #2)

Copes-Vulcan Co. Model D-100-60

Actuates NaOH to CS Valves (AOV-836 A,B)

Licensee Reference 1617

Required Operating Time: Short term (minutes)

TER Checksheet No. 3

Reference 59, Section 4.7.5

Licensee Submittal: Table 3, Page 1 [1]; FRC SCEW 3

## Equipment Item No. 4

Solenoid Valves Located in Intermediate Building (Area #3)

Lawrence Co. Model 110114W

Actuates Main Steam Isolation Valves - Supply Side (V-3516)

Licensee Reference 18

Required Operating Time: Very short (seconds)

TER Checksheet No. 4

Reference 59, Section 4.5.2.10

Licensee Submittal: Page 10 [62]; Table 3, Page 1 [1]; FRC SCEW 4

Equipment Item No. 5  
 Solenoid Valves Located in Intermediate Building (Area #3)  
 Lawrence Co. Model 125434W  
 Actuates Main Steam Isolation Valves - Vent Side (V-3517)  
 Licensee Reference 18  
 Required Operating Time: Very short (seconds)  
 TER Checksheet No. 5  
 Reference 59, Section 4.5.2.10  
 Licensee Submittal: Page 10 [62]; Table 3, Page 1 [1]; FRC SCEW 5

Equipment Item No. 6  
 Solenoid Valves Located Inside Containment (Area #1)  
 Versa Valve Co. Model VSG  
 Actuates Containment Recirculation System Dampers (V-5871 through V-5876)  
 Licensee Reference 19  
 Required Operating Time: Very short (seconds)  
 TER Checksheet No. 6  
 Reference 59, Section 4.5.2.11  
 Licensee Submittal: Page 10 [62]; Table 3, Page 1 [1]; FRC SCEW 6

Equipment Item No. 7  
 Solenoid Valves Located in Auxiliary Building (Area #2)  
 Automatic Switch Co. (ASCO), Model Not Stated  
 Actuates SI Recirculation Valves (AOV-897, 898)  
 Licensee Reference 1617  
 Required Operating Time: Short term (before sump recirculation)  
 TER Checksheet No. 7  
 Reference 59, Section 4.7.4  
 Licensee Submittal: Table 3, Page 2 [1]; FRC SCEW 7

Equipment Item No. 8  
 Solenoid Valves Located Inside Containment (Area #1)  
 Versa Valve Co. Model VSG-3731  
 Actuates Containment Purge Valves (Plant ID Not Stated)  
 Licensee Reference 19  
 Required Operating Time: Seconds  
 TER Checksheet No. 8  
 Reference 59, Section 4.6.9  
 Licensee Submittal: Page 13 [62]; Table 3, Page 2 [1]; FRC SCEW 8

Equipment Item No. 9  
Solenoid Valves Located Inside Containment (Area #3)  
Versa Valve Co. Model VSG-3421  
Actuates Containment Depressurization Valves (Plant ID Not Stated)  
Licensee Reference 19  
Required Operating Time: Seconds  
TER Checksheet No. 9  
Reference 59, Section 4.6.9  
Licensee Submittal: Page 13 [62]; Table 3, Page 2 [1]; FRC SCEW 9

Equipment Item No. 10  
Solenoid Valves Located Inside Containment (Area #1)  
Valcor Engineering Corp. Model V57300  
Pressurizer PORVs (Plant ID Not Stated)  
Licensee References 1547, 1568, 1569, 1801, 1835, 2796, 2797, 2798, 2799,  
2800, and 2801  
Required Operating Time: Long term  
TER Checksheet No. 10  
Reference 59, Section 4.6.12  
Licensee Submittal: Page 15 [62]; Table 3, Page 10 [1]; FRC SCEW 62

Equipment Item No. 11  
Solenoid Valves Located in Basement of Control Building (Area #8)  
Johnson Controls Model D251  
Actuation of Control Room Air Handling Unit Dampers (Plant ID Not Stated)  
Licensee reference not cited  
Required Operating Time: Short term  
TER Checksheet No. 11  
Reference 59, Section 4.7.17  
Licensee Submittal: Table 3, Page 11 [1]; FRC SCEW 67

Equipment Item No. 12  
Motorized Valve Actuators Located Inside Containment (Area #1)  
Limatorque Model SMB-2 with Reliance Electric Co. Motor  
Operates Accumulator Discharge Valve (MOV-841, 865)  
Licensee References 26, 637, and 639  
Required Operating Time: Not required to operate  
TER Checksheet No. 12  
Reference 59, Section 4.4.1  
Licensee Submittal: Page 7 [62]; Table 3, Page 2 [1]; FRC SCEW 10

## Equipment Item No. 13

Motorized Valve Actuators Located in Auxiliary Building (Area #2)

Limatorque Model SMB-00 with Peerless Electric Co. Motor

Actuates BAST to SI Pump Valves (MOV-826A, B, C, D); and RWST to SI Pump Valves (MOV-896A, B)

Licensee Reference 12

Required Operating Time: Short term (before sump recirculation)

TER Checksheet No. 13

Reference 59, Section 4.3.3.4

Licensee Submittal: Page 6 [62]; Table 3, Page 2 [1]; FRC SCEW 11, 12

## Equipment Item No. 14

Motorized Valve Actuators Located in Auxiliary Building (Area #2)

Limatorque Model SMB-00 with Reliance Electric Co. Motor

Actuates Valves in Lines Between RWST and SI Pumps Valve (MOV-825A, B)

Licensee References 12, 87, and 662

Required Operating Time: Short term (before sump recirculation)

TER Checksheet No. 14

Reference 59, Section 4.3.3.5

Licensee Submittal: Page 7 [62]; Table 3, Page 3 [1]; FRC SCEW 13

## Equipment Item No. 15

Motorized Valve Actuators Located in Intermediate Building (Area #3)

Limatorque Model SMB-00 with Reliance Electric Co. Motor

Actuates AFW Discharge Valves (MOV-4007, 4008); AFW Suction Valves (MOV-4027, 4028); and AFW Cross-Connect Valves (MOV-4000A, B)

Licensee reference not cited

Required Operating Time: Short term.

TER Checksheet No. 15

Reference 59, Section 4.3.3.1

Licensee Submittal: Page 5 [62]; Table 3, Page 3 [1]; FRC SCEW 14, 15, 16

## Equipment Item No. 16

Motorized Valve Actuators Located in Auxiliary Building (Area #2)

Limatorque Model SMB-00 with Reliance Electric Co. Motor

Actuates Sump Valves (MOV-850A, B); RHR to SI Valves (MOV-857A, B, C); RWST to RHR Valves (MOV-856); and CS Valves (MOV-860A, B, C, D and MOV-704A, B)

Licensee References 87, 637, 639, 659, and 662

Required Operating Time: Long term

TER Checksheet No. 16

Reference 59, Section 4.3.1.4

Licensee Submittal: Page 5 [62]; Table 3, Page 3 [1]; FRC SCEW 17, 18, 19, 20

## Equipment Item No. 17

Motorized Valve Actuators Located Inside Containment (Area #1)

Limatorque Model SMB-00 with Peerless Motor

Actuates Valves for RHR Suction from Sump B (MOV-851A, B); SI Valves to Cold  
Legs (MOV-878B, D); SI Valves to Hot Legs (MOV-878A, C)

Licensee Reference 12

Required Operating Time: Not required to operate

TER Checksheet No. 17

Reference 59, Section 4.4.2

Licensee Submittal: Page 7 [62]; Table 3, Pages 3 and 4 [1];  
FRC SCEW 21, 22, 72

## Equipment Item No. 18

Motorized Valve Actuators Located Inside Containment (Area #1)

Limatorque Model SMB-1 with Reliance Electric Co. Motor

Actuates Core Deluge Valves (MOV-852A, B)

Licensee References 26, 637, and 639

Required Operating Time: SI signal

TER Checksheet No. 18

Reference 59, Section 4.3.3.2

Licensee Submittal: Page 6 [62]; Table 3, Page 4 [1]; FRC SCEW 23

## Equipment Item No. 19

Motorized Valve Actuators Located in Auxiliary Building Addition (Area #6)

Limatorque Model SMB-00 with Reliance Electric Co. Motor

Actuates Standby AFW Valves (MOV-9703A, B; 9704A, B; 9710A, B)

Licensee References 27, 30, and 33

Required Operating Time: Long term

TER Checksheet No. 19

Reference 59, Section 4.7.2

Licensee Submittal: Table 3, Page 4 [1]; FRC SCEW 24, 25, 26

## Equipment Item No. 20

Motors Located in Auxiliary Building Addition (Area #6)

General Electric Type K, 250 hp

Drive Standby Auxiliary Feedwater Pumps (Plant ID Not Stated)

Licensee References 27 and 30

Required Operating Time: Long term

TER Checksheet No. 20

Reference 59, Section 4.7.6

Licensee Submittal: Table 3, Page 4 [1]; FRC SCEW 27

Equipment Item No. 21  
Motors Located in Auxiliary Building (Area #2)  
Westinghouse 444 TS TBDP 200 hp  
Containment Spray Pump Motors (Plant ID Not Stated)  
Licensee References 604 and 605  
Required Operating Time: Long term  
TER Checksheet No. 21  
Reference 59, Section 4.7.7  
Licensee Submittal: Page 14 [62]; Table 3, Page 4 [1]; FRC SCEW 29

Equipment Item No. 22  
Motors Located in Auxiliary Building (Area #2)  
Westinghouse 444 TS TBDP 150 hp  
Component Cooling Water Pump Motors (Plant ID Not Stated)  
Licensee References 604 and 605  
Required Operating Time: Long term  
TER Checksheet No. 22  
Reference 59, Section 4.7.7  
Licensee Submittal: Page 14 [62]; Table 3, Page 4 [1]; FRC SCEW 28

Equipment Item No. 23  
Motors Located in Auxiliary Building (Area #2)  
Westinghouse 445 TS TBDP 200 hp  
RHR Pump Motors (Plant ID Not Stated)  
Licensee References 42, 604, and 605  
Required Operating Time: Long term  
TER Checksheet No. 23  
Reference 59, Section 4.7.7  
Licensee Submittal: Page 14 [62]; Table 3, Page 4 [1]; FRC SCEW 30

Equipment Item No. 24  
Motors Located on Basement Level of Intermediate Building  
Westinghouse Type 505US ABDP, 250 hp  
Drive Auxiliary Feedwater Pumps (Plant ID Not Stated)  
Licensee References 42 and 604  
Required Operating Time: Long term  
TER Checksheet No. 24  
Reference 59, Section 4.6.2  
Licensee Submittal: Table 3, Page 5 [1]; FRC SCEW 31

## Equipment Item No. 25

Motors Located in the Auxiliary Building (Area #3)

Westinghouse 509 US AFDP 350 hp

Safety Injection Pump Motors (Plant ID Not Stated)

Licensee References 42 and 604

Required Operating Time: Long term

TER Checksheet No. 25

Reference 59, Section 4.7.7

Licensee Submittal: Page 14 [62]; Table 3, Page 5 [1]; FRC SCEW 32

## Equipment Item No. 26

Motors Located in Screen House (Area #5)

Westinghouse 509 UPH ABDP, 300 hp

Drive Service Water Pumps (Plant ID Not Stated)

Licensee Reference 42

Required Operating Time: Long term

TER Checksheet No. 26

Reference 59, Section 4.7.8

Licensee Submittal: Table 3, Page 5 [1]; FRC SCEW 33

## Equipment Item No. 27 (TMI Action Plan Item)

Motor Located Inside Containment (Area #1)

Westinghouse Model TEFC 2-hp, 3-phase, 60-Hz, 230/460-V

Drives Hydrogen Recombiner Blower (Plant ID Not Stated)

Licensee References 585, 637, and 639

Required Operating Time: Long term

TER Checksheet No. 27

Reference 59, Section 4.7.3

Licensee Submittal: Page 14 [62]; Table 3, Page 11 [1]; FRC SCEW 65

## Equipment Item No. 28

Motors Located in Auxiliary Building (Area #2)

U.S. Electrical Motors Model VEU, 100 hp Frame 84-445U, Class B Insulation

Drive Charging Pumps (Plant ID Not Stated)

Licensee reference not cited

Required Operating Time: Long term

TER Checksheet No. 28

Reference 59, Section 4.7.16

Licensee Submittal: Table 3, Page 11 [1]; FRC SCEW 66



## Equipment Item No. 29

Motors Located in Auxiliary Building (Area #2)

Westinghouse Model SBDP, 2 hp, Class B Insulation

Drive Cooling Fans for RHR Pump Motors (Plant ID Not Stated)

Licensee Reference 605

Required Operating Time: Long term

TER Checksheet No. 29

Reference 59, Section 4.7.12

Licensee Submittal: Page 15 [62]; Table 3, Page 12 [1]; FRC SCEW 70

## Equipment Item No. 30

Motors Located in Auxiliary Building (Area #2)

Westinghouse Model SBDP, 3 hp, Class B Insulation

Drive Cooling Fans for CS, Charging Pumps, and SI Pump Motors (Plant ID Not Stated)

Licensee Reference 605

Required Operating Time: Long term

TER Checksheet No. 30

Reference 59, Section 4.7.12

Licensee Submittal: Page 15 [62]; Table 3, Page 12 [1]; FRC SCEW 69

## Equipment Item No. 31

Electrical Penetrations Located Within and Outside Containment (Area #1)

Crouse-Hinds Co. (Various Conductor Configurations; Models Not Stated)

Provides Connection for Electrical Circuits

Licensee References 33, 37, 40, 537, and 749

Required Operating Time: Long term

TER Checksheet No. 31

Reference 59, Section 4.2.1.1

Licensee Submittal: Page 5 [62]; Table 3, Page 5 [1]; FRC SCEW 34

## Equipment Item No. 32

Electrical Penetration Located Both Within and Outside Containment (Area #1)

Westinghouse, Model Not Stated

Provides Connection for Electrical Circuits

Licensee References 38, 2098, 2099, 2100, 2101, 2102, 2103, 2104, and 2105

Required Operating Time: Long term

TER Checksheet No. 32

Reference 59, Section 4.6.3

Licensee Submittal: Page 11 [62]; Table 3, Page 5 [1]; FRC SCEW 35

## Equipment Item No. 33

Terminal Blocks Located Inside Containment (Area #1)

Westinghouse Model 542247

Provides Connection for Electrical Circuits

Licensee References 31, 39, and 718

Required Operating Time: Long term

TER Checksheet No. 33

Reference 59, Section 4.6.4

Licensee Submittal: Page 12 [62]; Table 3, Page 6 [1]; FRC SCEW 36

## Equipment Item No. 34

Electric Cables Located Inside Containment (Area #1)

Kerite Co. Cable Type HT

Power Cables, Provides Electrical Distribution

Licensee References 10, 34, 574, and 2052

Required Operating Time: Long term

TER Checksheet No. 34

Reference 59, Section 4.5.2.3

Licensee Submittal: Page 7 [62]; Table 3, Page 6 [1]; FRC SCEW 37

## Equipment Item No. 35

Electric Cables Located Inside Containment

Kerite Co. Cable Type HT

Control Cable, Provides Electrical Distribution

Licensee References 10, 34, 574, and 2052

Required Operating Time: Long term

TER Checksheet No. 35

Reference 59, Section 4.5.2.3

Licensee Submittal: Page 7 [62]; Table 3, Page 6 [1]; FRC SCEW 37

## Equipment Item No. 36

Electric Cables Located Outside Containment

Kerite Co., Cable Type HT

Control Cable, Provides Electrical Distribution

Licensee References 10, 34, 574, and 2052

Required Operating Time: Long term

TER Checksheet No. 36

Reference 59, Section 4.3.3.3

Licensee Submittal: Page 6 [62]; Table 3, Page 6 [1]; FRC SCEW 38

Equipment Item No. 37  
Electrical Cable Located Inside Containment (Area #1)  
Coleman Cable Co.  
Instrumentation Cables  
Licensee References 29 and 2052  
Required Operating Time: Long term  
TER Checksheet No. 37  
Reference 59, Section 4.5.2.7  
Licensee Submittal: Page 9 [62]; Table 3, Page 6 [1]; FRC SCEW 39

Equipment Item No. 38  
Electrical Cables Located Outside Containment  
Coleman Cable Co.  
Provides Electrical Distribution  
Licensee References 29 and 2052  
Required Operating Time: Long term  
TER Checksheet No. 38  
Reference 59, Section 4.5.2.8  
Licensee Submittal: Page 10 [62]; Table 3, Page 6 [1]; FRC SCEW 40

Equipment Item No. 39  
Electrical Cables Located Outside Containment  
Rome Cable Co.  
Licensee References 9, 29, and 2052  
Required Operating Time: Long term  
TER Checksheet No. 39  
Reference 59, Section 4.5.2.8  
Licensee Submittal: Page 9 [62]; Table 3, Page 7 [1]; FRC SCEW 41

Equipment Item No. 40  
Electrical Cables Located Outside Containment  
General Cable Co.  
Licensee References 9, 29, and 2052  
Required Operating Time: Long term  
TER Checksheet No. 40  
Reference 59, Section 4.5.2.9  
Licensee Submittal: Page 10 [62]; FRC SCEW 42

Equipment Item No. 41  
Level Transmitter Located in Auxiliary Building (Area #2)  
Foxboro Model 611 GM-ASI  
RWST Level (LT-920)  
Licensee reference not cited  
Required Operating Time: Short term (before sump recirculation)  
TER Checksheet No. 41  
Reference 59, Section 4.3.1.3  
Licensee Submittal: Page 5 [62]; Table 3, Page 7 [1]; FRC SCEW 43

Equipment Item No. 42  
Level Switch Located in Auxiliary Building (Area #2)  
ITT-Barton Model 289  
RWST Level (LIC-921)  
Licensee reference not cited  
Required Operating Time: Short term (before sump recirculation)  
TER Checksheet No. 42  
Reference 59, Section 4.5.2.2  
Licensee Submittal: Page 7 [62]; Table 3, Page 7 [1]; FRC SCEW 44

Equipment Item No. 43  
Flow Transmitters Located Inside Containment (Area #1)  
Barton Model 332  
Steam Line Flow Transmitters (FT-464, 465, 474, and 475)  
Licensee Reference 567  
Required Operating Time: Seconds  
TER Checksheet No. 43  
Reference 59, Section 4.6.7  
Licensee Submittal: Page 12 [62]; Table 3, Page 7 [1]; FRC SCEW 45

Equipment Item No. 44  
Pressure Transmitters Located in Intermediate Building  
ITT-Barton Model 332  
Containment Pressure Transmitters (PT-945, 946, 947, 948, and 949)  
Licensee Reference 567  
Required Operating Time: Long term  
TER Checksheet No. 44  
Reference 59, Section 4.6.8  
Licensee Submittal: Page 13 [62]; Table 3, Page 7 [1]; FRC SCEW 46

Equipment Item No. 45  
Pressure Transmitters Located Inside Containment (Area #1)  
Foxboro Model 611 GM-DSI  
Pressurizer Pressure (PT-429, 430, 431, 449)  
Licensee References 637 and 639  
Required Operating Time: Short term  
TER Checksheet No. 45  
Reference 59, Section 4.6.5  
Licensee Submittal: Page 12 [62]; Table 3, Page 8 [1]; FRC SCEW 47

Equipment Item No. 46  
Pressure Transmitters Located in Intermediate Building (Area #3)  
Foxboro Model 611 GM-DSI  
Steam Line Pressure (PT-468, 469, 478, 479, 482, 483)  
Licensee References 637 and 639  
Required Operating Time: Short term  
TER Checksheet No. 46  
Reference 59, Section 4.3.1.1  
Licensee Submittal: Page 5 [62]; Table 3, Page 8 [1]; FRC SCEW 48

Equipment Item No. 47  
Level Transmitters Located Inside Containment (Area #1)  
Foxboro Model 613 M-MDL, Modified  
Monitors Pressurizer Level (LT-426, 427, 428, and 433)  
Licensee reference not cited  
Required Operating Time: Not specified  
TER Checksheet No. 47  
Reference 59, Section 4.6.6  
Licensee Submittal: Page 12 [62]; Table 3, Page 8 [1]; FRC SCEW 49

Equipment Item No. 48  
Level Transmitters Located in Auxiliary Building (Area #2)  
Foxboro Model 613 DM-MSI  
BAST Level (LT-102, 106, 171, 172)  
Licensee reference not cited  
Required Operating Time: Short term  
TER Checksheet No. 48  
Reference 59, Section 4.3.1.2  
Licensee Submittal: Page 5 [62]; Table 3, Page 8 [1]; FRC SCEW 50

Equipment Item No. 49  
Level Transmitters Located Inside Containment (Area #1)  
Foxboro Model 613 HM-HSI  
Steam Generator Level (LT-470, 471, 472, 473, 460, 461, 462, 463)  
Licensee reference not cited  
Required Operating Time: Not specified  
TER Checksheet No. 49  
Reference 59, Section 4.6.11  
Licensee Submittal: Page 13 [62]; Table 3, Page 8 [1]; FRC SCEW 51

Equipment Item No. 50 (TMI Action Plan Item II.F.2)  
Resistance Temperature Detectors Located Inside Containment (Area #1)  
Rosemount Model 176JA  
Reactor Coolant System Temperature (Plant ID Not Stated)  
Licensee Reference 571  
Required Operating Time: Not specified  
TER Checksheet No. 50  
Reference 59, Section 4.6.10  
Licensee Submittal: Page 13 [62]; Table 3, Page 9 [1]; FRC SCEW 52

Equipment Item No. 51  
Battery Banks Located in Battery Rooms on Basement Level of Control  
Building (Area #8)  
Gould Industrial Battery Division, Model FTA-19  
Provide DC Power Supply (Plant ID Not Stated)  
Licensee Reference 22  
Required Operating Time: Long term  
TER Checksheet No. 51  
Reference 59, Section 4.7.9  
Licensee Submittal: Table 3, Page 9 [1]; FRC SCEW 53

Equipment Item No. 52  
Diesel Generator Electrical Equipment Located in D/G Annex (Area #4)  
ALCO Diesel Engine, Model 251F and Controls  
Power Supply to Safeguards Buses (Plant ID Not Stated)  
Licensee reference not cited  
Required Operating Time: Long term  
TER Checksheet No. 52  
Reference 59, Section 4.7.10  
Licensee Submittal: Table 3, Page 9 [1]; FRC SCEW 54

Equipment Item No. 53  
Diesel Generator Electrical Equipment Located in D/G Annex (Area #4)  
Westinghouse 1900 kW Generator and Controls  
Power Supply to Safeguards Buses (Plant ID Not Stated)  
Licensee reference not cited  
Required Operating Time: Long term  
TER Checksheet No. 53  
Reference 59, Section 4.7.10  
Licensee Submittal: Table 3, Page 9 [1]; FRC SCEW 55

Equipment Item No. 54  
Diesel Generator Electrical Equipment Located in D/G Annex (Area #4)  
Westinghouse Model 1 hp TEFC AC Motor  
Drives Fuel Oil Transfer Pump (Plant ID Not Stated)  
Licensee reference not cited  
Required Operating Time: Long term  
TER Checksheet No. 54  
Reference 59, Section 4.7.10  
Licensee Submittal: Table 3, Page 9 [1]; FRC SCEW 56

Equipment Item No. 55  
Reactor Containment Fan Cooler Motors Located Inside Containment (Area #1)  
Westinghouse 588.5-CSP  
Containment Cooling (Plant ID Not Stated)  
Licensee References 40, 41, 42, 606, 637, 639, and 640  
Required Operating Time: Long term  
TER Checksheet No. 55  
Reference 59, Section 4.5.2.4  
Licensee Submittal: Page 7 [62]; Table 3, Page 9 [1]; FRC SCEW 57

Equipment Item No. 56  
Medium Voltage Switchgear Located in Intermediate Building (Area #3)  
Westinghouse Model DB-50A 1600-A  
Controls Reactor Trip System Power (Plant ID Not Stated)  
Licensee Reference 2898  
Required Operating Time: Seconds  
TER Checksheet No. 56  
Reference 59, Section 4.6.1  
Licensee Submittal: Page 10 [62]; Table 3, Page 9 [1]; FRC SCEW 58

Equipment Item No. 57  
Medium Voltage Switchgear Located in Turbine Building (A-7)  
Westinghouse Electric Corporation Model DH-350E 1200-A  
Controls Power to Reactor Coolant Pump Motors  
Licensee reference not cited  
Required Operating Time: Seconds  
TER Checksheet No. 57  
Reference 59, Section 4.6.1  
Licensee Submittal: Page 10 [62]; Table 3, Page 9 [1]; FRC SCEW 68

Equipment Item No. 58  
I&C Cabinets Located in the Relay Room on Intermediate Level of  
Control Building (Area #8)  
Foxboro Co., Model Not Stated  
Provide Housing for I&C RP Circuits (Plant ID Not Stated)  
Licensee reference not cited  
Required Operating Time: Long term  
TER Checksheet No. 58  
Reference 59, Section 4.7.13  
Licensee Submittal: Not Stated; FRC SCEW 59

Equipment Item No. 59  
Various Relay Racks Located in Relay Room on Intermediate Level of  
Control Building  
Westinghouse, Model Not Stated  
Licensee reference not cited  
Required Operating Time: Long term  
TER Checksheet No. 59  
Reference 59, Section 4.7.13  
Licensee Submittal: Table 3, Page 10 [1]; FRC SCEW 71

Equipment Item No. 60  
HVAC System Located Outside Containment (Area #8)  
Westinghouse System Z162  
Provides HVAC of Control Room Atmosphere (Plant ID Not Stated)  
Licensee reference not cited  
Required Operating Time: Long term  
TER Checksheet No. 60  
Reference 59, Section 4.7.14  
Licensee Submittal: Table 3, Page 10 [1]; FRC SCEW 60

Equipment Item No. 61  
Cable Splices Located Inside Containment (Area #1)  
Raychem Co. Type WCSF-N  
Provide Circuit Continuity (Plant ID Not Stated)  
Licensee References 25, 35, 574, 2052, and 2099  
Required Operating Time: Long term  
TER Checksheet No. 61  
Reference 59, Section 4.5.2.5  
Licensee Submittal: Page 9 [62]; Table 3, Page 10 [1]; FRC SCEW 61



Equipment Item No. 62 (TMI Action Plan Item II.F.1)  
 Level Switches Located Inside Containment (Area #1)  
 Gems Corporation, Special Model, Similar to LS-1900  
 Containment Sump "B" Level (LC-942 and -943)  
 Licensee reference not cited  
 Required Operating Time: Not specified  
 TER Checksheet No. 62  
 Reference 59, Section 4.7.11  
 Licensee Submittal: Table 3, Page 10 [1]; FRC SCEW 63

Equipment Item No. 63 (TMI Action Plan Item)  
 Hydrogen Recombiner Igniter Exciter Units Located Inside Containment (Area #1)  
 Westinghouse GLA Part No. 43737, Rev. A  
 Hydrogen Recombination (Plant ID Not Stated)  
 Licensee References 585, 637, and 639  
 Required Operating Time: Long term  
 TER Checksheet No. 63  
 Reference 59, Section 4.7.18  
 Licensee Submittal: Page 14 [62]; Table 3, Page 11 [1]; FRC SCEW 64

Equipment Item No. 64 (TMI Action Plan Item II.D.3)  
 Limit Switch Located Inside Containment (Area #1)  
 NAMCO, Model Not Stated  
 Position Indication for the Pressurizer Safety and Relief Valves  
 (Plant ID Not Stated)  
 Licensee References 2041 and 2795  
 Required Operating Time: Not specified  
 TER Checksheet No. 64  
 Licensee Submittal: Page 1 [65]; FRC SCEW 73

Equipment Item No. 65 (TMI Action Plan Item II.D.3)  
 Linear Variable Differential Transformer Limit Switch Located Inside  
 Containment (Area #1)  
 Schaevitz Model 500-HCA  
 Position Indication for the Pressurizer Safety and Relief Valves  
 (Plant ID Not Stated)  
 Licensee Reference 2041  
 Required Operating Time: Not specified  
 TER Checksheet No. 65  
 Licensee Submittal: Page 1 [65]; FRC SCEW 74

Equipment Item No. 66 (TMI Action Plan Item II.B.1)  
Solenoid Valves Located Inside Containment (Area #1)  
Valcor Engineering Corp., Model Not Stated  
Reactor Vessel Head Vent (Plant ID Not Stated)  
Licensee References 1547, 1568, 1569, 1801, 1835, 2796, 2797, 2798, 2799,  
2800, and 2801  
Required Operating Time: Long term  
TER Checksheet No. 66  
Licensee Submittal: Page 1 [65]; FRC SCEW 66

Equipment Item No. 67  
Pressure Transmitters Located in Auxiliary Building  
ITT-Barton Model 332  
Containment Pressure Transmitters (Plant ID Not Stated)  
Licensee Reference 567  
Required Operating Time: Long term  
TER Checksheet No. 67  
Reference 59, Section 4.5.2.1  
Licensee Submittal: Page 13 [62]; Table 3, Page 7 [1]; FRC SCEW 46

## APPENDIX C - PLANT SAFETY-RELATED SYSTEMS AND DISPLAY INSTRUMENTATION

In accordance with the DOR Guidelines, the Licensee was directed to establish a list of systems and display instrumentation needed to mitigate the consequences of a loss-of-coolant accident (LOCA) or a high energy line break (HELB), inside or outside containment, and reach safe shutdown. The lists of safety-related systems and display instrumentation were developed from a review of plant safety analyses and emergency procedures. The display instrumentation selected included equipment needed to monitor overall plant performance as well as performance of the systems on the list. The systems list was established on the basis of the functions that must be performed in order to mitigate the consequences of a LOCA or HELB without regard to location of equipment relative to a potentially hostile environment. The NRC staff determined and verified that the systems considered by the Licensee are 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 environment. The systems and instrumentation list, as provided in the NRC SER of June 1, 1981, is contained in this appendix.

In its SER dated June 1, 1981 [61], the NRC indicated that the Licensee should provide justifications for certain equipment items which had been identified as important to safety but were not included on the list of equipment to be qualified. Technical evaluations of the justifications provided by the Licensee are also included in this appendix.

In addition, the Licensee has indicated that certain instrument items should be deleted from and others should be added to the list of accident mitigating and safe shutdown instruments. A technical evaluation of the Licensee's rationale for deleting these items is also provided in this appendix.

## C.1 SYSTEMS AND DISPLAY INSTRUMENTATION LIST

## A. Safe Shutdown Systems

Reactor Protection/Trip System\*  
 Main Steam (MSIVs, Safeties, Atmospheric Reliefs)\*  
 Auxiliary Feedwater\*/Standby Auxiliary  
 Chemical and Volume Control (Charging Portions)\*  
 Residual Heat Removal\*\*  
 Component Cooling  
 Service Water  
 Diesel Generator\*  
 125-V dc Power Supply System\*  
 Diesel Oil\*  
 Vital Instrument Power Supply\*  
 Auxiliary Power Distribution System  
 Primary Auxiliary Building Ventilation System  
 Control Building HVAC Systems  
 Diesel Room Ventilation Systems

## B. Accident Mitigating System (LOCA, MSLB, FWLB)

Pressurizer Pressure Relief  
 Containment Isolation System\*  
 Reactor Containment Fan Coolers, Hydrogen Purge and Hydrogen Recombiners  
 Safety Injection and Accumulators  
 Post-Accident Sampling and Monitoring/Containment Radiation Monitor  
 Containment Spray  
 Feedwater Control and Bypass Valves/Feedpump Trip/Feedpump Discharge  
 Valves  
 Pump Room Ventilation Coolers (RHR/SI/I/L/CS/CCP)  
 Control Room Ventilation  
 Main Steam Isolation Valves

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\*Systems required for both safe shutdown and accident mitigation.

\*\*System required for cold shutdown only.

C. Accident Mitigating and Safety Shutdown Instruments (LOCA, MSLB, FWLB)

Pressurizer Level  
Pressurizer Pressure  
RCS Temperature  
Containment Pressure\*\*\*  
Steam Line Pressure  
Steam Line Flow  
Safety Injection Flow\*\*\*  
Sump Level\*\*\*  
Steam Generator Level  
Auxiliary Feed System Flow  
Chemical and Volume Control Flow  
RWST Level  
BAST Level\*\*\*  
Residual Heat Removal Flow  
Component Cooling Water Flow  
Service Water System  
Diesel Generator  
Emergency ac Power  
Emergency dc Power

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\*\*\*Instruments required only for accident mitigation purposes.

## C.2 LICENSEE JUSTIFICATION FOR OMITTING CERTAIN EQUIPMENT ITEMS FROM THE LIST

## C.2.1 Item 4.1.1, Atmospheric Steam Dump Valves

Licensee Discussion [62]

"In 4.1.1, it is noted that certain other items should be added to the list of safety-related electrical equipment requiring environmental qualification. These are discussed below:

Steam dump to atmosphere valves. These valves are required only for eventual cold shutdown of the reactor, not for accident mitigation. As discussed in Section 3.2 of the NRC's 'SEP Review of Safe Shutdown Systems for the R. E. Ginna Nuclear Power Plant,' manual operation of the atmospheric dump valves is acceptable. There is thus no need to qualify this equipment."

Evaluation

As pointed out by the NRC in the SEP Review of Safe Shutdown Systems for Ginna, atmospheric steam dump valves are air-operated valves, the air supply to which is not Class I. However, the NRC found manual operation of these valves to be acceptable. In Section 3.2 of the report, under the heading Steam Generator Heat Removal, the NRC stated:

"The safety-grade shutdown components associated with the Main Steam System are the main steam isolation valves (MSIV), the steam safety valves, and the steam atmospheric dump valves. Each of the two Ginna steam generators is equipped with an air-operated, solenoid controlled MSIV, four code safety valves, and one air-operated atmospheric dump valve. By shutting the MSIVs from the control room, the operator can limit the shutdown and cooldown of the plant to the use of redundant main steam equipment.\* The MSIVs fail shut on loss of control air. For core decay heat removal with natural circulation of the reactor coolant, only one steam generator and one of its four safety valves are required to remove core decay heat a few seconds after reactor trip. One atmospheric steam dump valve which can be operated from the control room using the plant compressed air system is sufficient for maintaining hot shutdown or for cooldown of the RCS below hot shutdown conditions. However, the plant air systems are not Class I so manual opening of the atmospheric dump would be required if the shutdown procedures were limited to use

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\*The operator would not normally do this unless the systems which are normally used for shutdown and cooldown were not operable.

of safety grade equipment alone. Since there is no need to proceed immediately from hot shutdown to cold shutdown, an operator is not required to man an atmospheric dump within the first half hour to several hours after achieving hot shutdown. We have determined that this manual operation of the atmospheric dumps is acceptable under the provisions of the BTP."

Conclusion

The atmospheric steam dump valves do not require environmental qualification because they are not required to perform an accident mitigation function and because manual operation is acceptable for cold shutdown purposes.

## C.2.2 Item 4.1.1, Valve Actuators 878A and 878C

Licensee Discussion [62]

"In 4.1.1, it is noted that certain other items should be added to the list of safety-related electrical equipment requiring environmental qualification. These are discussed below:

Actuators for valves in the hot leg injection paths (878A, 878C). A discussion of these valves was inadvertently omitted. These should have been discussed together with item 8G of the October 31, 1980 submittal (878B, 878D). The 878A and 878C valves are locked in position (closed) with power removed. No credit is taken for hot leg Safety Injection flow in the Ginna Safety Analysis. These valves should thus be classified in NRC Category III, equipment that is exempt from qualification."

Evaluation [59]

In evaluating Equipment Item 8G (Valves 878B and 878D, cold leg injection valves) in TER-C5257-178 [59], it was determined that these valves should be placed in NRC Category III because they were locked in their safety position (open) with power removed. However, valves 878A and 878C, the hot leg injection valves, are locked closed.

The Ginna Final Safety Analysis Report (FSAR), Section 6.2.2, states that the safety injection pumps deliver water through four connections, one in each hot leg and one in each cold leg of the RCS. Furthermore, Section 14.3, discussing small break LOCAs states:

"RESULTS - SMALL BREAKS

The preceding paragraphs have demonstrated the adequacy of the accumulators to terminate core exposure and limit the temperature rise of the core for large area ruptures. For smaller breaks the discharge of fluid through the hole is less severe and for small enough breaks the high head safety injection pump is capable of maintaining flooding of the core hot spot for the entire blowdown.

Three combinations of high head safety injection equipment operation were considered:

1. Full system; three pumps delivering through the four injection lines.
2. Single failure; two pumps delivering through three lines, one injection line isolation valve failed to open.



3. Single failure and broken safety injection line; one pump delivering to intact header and second pump delivering to second header with one line broken.

(This is a special case where the loss of coolant is caused by a break in the safety injection line between the reactor coolant pipe and the check valve in the injection line. In this case not only is the flow lost through the one line, but the effective cut-in pressure for delivery is reduced until the pressure loss due to flow in the spilling line equals the Reactor Coolant back pressure. Since the injection lines are only 2 inches in diameter, this case applies for break sizes 2 inches and smaller.)"

It is apparent that the FSAR assumes availability of the hot leg injection points. In fact, it appears that, with both hot leg injection valves disabled closed and a broken cold leg injection line, the system is reduced from three pumps discharging to four lines to one pump discharging to one line (the other two pumps pumping out the break). At this point, a single-active failure to that pump would cause all safety injection flow to be interrupted until certain motor-operated valves (such as MOV-871A and -871B) could be realigned to redirect the discharge of one of the operable pumps from the broken cold leg line to the intact line.

Consequently, it is not apparent why valves 878A and 878C are locked closed. It is possible that modifications may have been made to the plant since the FSAR was written; however, from the documentation available, it does not appear that valves 878A and 878C should be disabled closed.

#### Conclusion

Valves 878A and 878C should be qualified for the post-accident environment in order to retain post-accident operability.

C.2.3 Item 4.1.1, RHR Heat Exchanger Discharge Valves

Licensee Discussion [62]

"In 4.1.1, it is noted that certain other items should be added to the list of safety-related electrical equipment requiring environmental qualification. These are discussed below:

I/P converters in the RHR heat exchanger discharge valves. As discussed in our October 31, 1980 submittal, these controllers have no post-accident function (these RHR system valves are normally open, and need only remain open; the I/P controller fails open). It is thus not considered that qualification is required."

Evaluation

Although these valves have no post-accident function other than to remain open, the Licensee should ensure that electrical failure of the converters will not affect other safety-related equipment or circuits.

Conclusion

Environmental qualification of the I/P converters is not required provided their failure cannot adversely affect other safety-related equipment or circuits.

## C.2.4 Item 4.1.1, Valve Limit Switches

Licensee Discussion [62]

"In 4.1.1, it is noted that certain other items should be added to the list of safety-related electrical equipment requiring environmental qualification. These are discussed below:

Limit switches. RG&E reference 44, 'Limit Switches,' includes a January 16, 1979 letter from Leon D. White, Jr. to Boyce H. Grier. This letter provides our rationale that limit switches need not be environmentally qualified for Ginna. In the case of containment isolation valve limit switches for position indication in particular, the NRC specifically exempted them from the list of safety-related electrical equipment during the May 5, 1980 site visit to Ginna. Note that containment isolation valve position indication is not listed in Table C of Appendix D of the SER."

Evaluation

The January 16, 1979, letter referred to in the Licensee's statement on page 3a makes essentially the following points:

1. Valve control circuits are unaffected by limit switch failure.
2. Each inside isolation valve is redundant to an outside containment isolation valve.
3. The circuits for the position indicators are non-IE; therefore, qualification of individual components within these circuits would not significantly increase safety.

The Licensee's arguments do not consider paragraph 3 of enclosure 2 to the DOR Guidelines [54], which states:

"(3) Plant emergency procedures typically include provisions for the operator to sample or monitor radioactivity levels or combustible gas levels, to confirm that valves are in the correct position, to monitor flow or temperature, etc. Some of these functions are essential for correct operator action, to mitigate accidents, and prevent radioactive releases. When this is the case, the radiation sensors, valve position indicators, pressure transmitters, thermocouples, etc. should be qualified to function in the relevant accident environment."

Also, the Licensee's arguments do not consider the information disseminated at the July 1981 industry meetings on environmental qualification where the NRC established that display instruments needed to ensure that a safety function has been performed must be environmentally qualified.

In view of the recent emphasis on the reliability of display instruments needed for the operator to verify the proper functioning of safety-related equipment or systems, it does not appear logical to conclude that these instruments should not be qualified for the very accidents (LOCA, MSLBs) during which they are most likely to be needed. Furthermore, the redundant isolation valves are subject to possible single failure, during which time certain containment penetrations would have no available isolation indication for the operator to observe. As for the argument that the circuits are non-IE, this does not appear to be a valid justification for determining that environmental qualification would not generally improve the reliability of the indication.

#### Conclusion

Containment isolation valve limit switches should be qualified for the post-accident environment to which they are subject.

### C.3 LICENSEE PROPOSED CHANGES TO THE LIST

#### C.3.1 Chemical and Volume Control Flow Instruments

##### Licensee Discussion [62]

"In Table C of Appendix D, a number of instruments appear which RC&E does not consider as being required for accident mitigation and/or safe shutdown. These instruments were not addressed in our October 31, 1980 submittal. For the reasons given below, the following instruments should be deleted from Table C.

Chemical and volume control flow -- This instrument is normally used only for safe shutdown to provide inventory control. However, pressurizer level information could also determine if inventory control was not being maintained."

##### Evaluation

Inventory control can be maintained by relying upon pressurizer level instrumentation assuming the lack of chemical and volume control instruments. However, these flow instruments most directly indicate the operation of a safety system. In addition, it is prudent to include the measurement of additional variables for backup information and for diagnosis. Although pressurizer level information can be used to determine inventory control, it cannot be used directly to verify the proper operation of the chemical and volume control system.

##### Conclusion

Chemical and volume control flow instruments should not be removed from the list of display instruments to be considered for environmental qualification.

### C.3.2 Diesel Generator Emergency Power Indication

#### Licensee Discussion [62]

"In Table C of Appendix D, a number of instruments appear which RG&E does not consider as being required for accident mitigation and/or safe shutdown. These instruments were not addressed in our October 31, 1980 submittal. For the reasons given below, the following instruments should be deleted from Table C.

Diesel generator, emergency AC power, emergency DC power--the effects of failure of these systems, resulting in failure of the powered equipment, would be apparent. There is thus no need for monitoring of the status of the electrical systems themselves."

#### Evaluation

As noted in Section 4 of this report, equipment environmental qualification checksheets for Equipment Items 52, 53, and 54 defer qualification review for the diesel generator and accessories because they are located in a mild environment.

C.3.3 Component Cooling Water and Service Water System

In Table A of Appendix D of the NRC SER [61], the component cooling water and service systems were identified as safe shutdown systems. The Licensee responded as follows [62]:

"The Component Cooling Water Flow and Service Water System indication were not addressed in the October 31 report, but will be added to the list of safety-related equipment. Since this equipment is in a mild environment, discussion of its environmental qualification requirements will be deferred."

The Licensee's response provides resolution of this concern.

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 [61]:

"Subsection 4.2 identified deficiencies that must be resolved to establish the qualification of the equipment; the staff requires that the information lacking in this category be provided within 90 days of receipt of this SER. Within this period, the licensee should either provide documentation of the missing qualification information which demonstrates that such equipment meets the DOR guidelines or NUREG-0588 or commit to a corrective action (requalification, replacement, relocation, and so forth) consistent with the requirements to establish qualification by June 30, 1982. If the latter option is chosen, the licensee must provide justification for operation until such corrective action is complete."

On January 19, 1982, FRC representatives met with NRC Division of Licensing personnel at NRC offices to discuss the potential for FRC to assist the staff in the technical review of licensees' statements regarding justification for interim plant operation submitted in response to outstanding qualification deficiencies in the NRC EEQ SERs. The results of the meeting were as follows: (1) FRC was requested to proceed immediately with the technical review of licensees' justification for interim operation, (2) the format was established, and (3) the criteria for the review were established. These criteria are presented in Section 2 of this appendix.

On January 21, 1982, the NRC provided the following modification to Final Assignment 13 concerning this subject:

"The FRC review will consist of:

- o Review the licensee's justification of interim operation and provide FRC independent analysis which shows whether or not licensee provided technically sound rationale as a basis for justification for continued plant operation.



- o On January 27, 1982, FRC shall provide a list of those power reactors that have provided technically sound justification for continued operation. FRC shall also provide a list of those power reactors which have not provided technically sound justification for continued operation. In addition to the lists, FRC may provide any additional information which in FRC's judgment is necessary to support the conclusions regarding justification for continued operation."

On January 25, 1982, the completed review of the licensees' statements was presented to the NRC as a basis for justification for interim operation in the response to the NRC EEQ SER.\* On February 5, 1982, at the NRC's request, 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: Rochester Gas and Electric Corporation  
Plant Name: R. E. Ginna  
NRC Docket No. 50-244  
NRC TAC No. 42520  
NRC Contract No. NRC-03-79-118  
FRC Project No. C5257  
FRC Assignment No. 13  
FRC Task No. 454

References:

- a. J. E. Maier  
Letter to D. M. Crutchfield (NRC)  
Subject: Environmental Qualification of Safety Related Electrical  
Equipment, R.E. Ginna (Response to NRC's SER and FRC TER-C5257-178)  
Rochester Gas & Electric Corp., 04-Sept-81
- b. J. E. Maier  
Letter to D. G. Eisenhut (NRC)  
Subject: Environmental Qualification of Electrical Equipment, R.E.  
Ginna Nuclear Power Plant  
Rochester Gas & Electric Corp., 30-Jan-81
- c. Office of Nuclear Reactor Regulation  
Safety Evaluation Report for R.E. Ginna Plant;  
Environmental Qualification of Safety-Related  
Electrical Equipment  
NRC, 01-June-81

The Licensee has submitted technical information in Reference a in response to the NRC SER [c] on environmental qualification. FRC has reviewed these documents [a, b, c]. As a result of this review, FRC concludes that the Licensee has stated that the equipment items are environmentally qualified; or has provided a technically sound rationale as a basis for justification for continued plant operation; or has provided a technically sound rationale or other additional information which in FRC's judgment provides a basis for justification for continued operation; with the following exceptions:

<u>Equipment Item</u>	<u>Equipment Description/ Function</u>	<u>SCEW Sheet No.</u>	<u>Status Code</u>	<u>Basis for Deficiency</u>
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None

The Licensee's response to the SER addressed and provided resolution of deficiencies identified in the SER and provided adequate rationale as a basis for justification for interim operation."

APPENDIX E - REQUEST FOR ADDITIONAL INFORMATION

This appendix contains the Request for Additional Information (RAI) that was developed during the course of the review and issued to the NRC for forwarding to the Licensee. The RAI was revised throughout the review to reflect the Licensee's response(s) to the 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

Rochester Gas and Electric Corporation  
R. E. Ginna Plant

NRC Docket No. 50-244

November 4, 1981

NRC TAC No. 42520

Rev. 1, January 13, 1982  
Rev. 2, February 26, 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 is the result of an evaluation of the information provided by letters dated September 4, 1981 [1] and January 30, 1981 [2]\*. FRC previously requested TMI Action Plan information by a telephone memorandum dated October 2, 1981 [3].

On November 6, 1981, RG&E Corporation transmitted detailed information of environmental qualification [6, 6.1, 6.2, 6.3, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.6, 6.3.6.1, 6.3.6.2, 6.3.6.3, 6.3.6.4]<sup>(1)\*\*</sup>

In addition, on November 25, 1981, FRC received from NRC information on environmental qualification [7].<sup>(1)</sup>

In response to the FRC request for information, the Licensee, on February 18, 1982 [8], transmitted most of the information requested. The following RAI item remains to be addressed by the Licensee: A.1.d. Information pertaining to Item A.2 is contained in the February 8, 1982 cover letter [8].<sup>(2)</sup>

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\*Numbers in brackets refer to citations found in the list of references.

\*\*Throughout the text, superscript numbers in parentheses indicate the revision in which the underlined material preceding the superscript was added.

## A. FRC REVIEW OF THE LICENSEE'S 90-DAY RESPONSE TO THE NRC EEQ SER

## INFORMATION REQUESTED

DATE RECEIVED BY FRC\*\*\*

1. In reference to the Licensee's 90-day response [1] to the NRC SER [4], a legible single copy of each of the following qualification documents is requested in order that the FRC evaluation may proceed:
  - a. RG&E Reference 44, "Limit Switches," including the January 16, 1979 letter from L. D. White, Jr. to B. H. Grier (Reference 1, Attachment 2, para. 5.d). 2/23/82 [8]<sup>(2)</sup>
  - b. SEP Review of Safe Shutdown Systems for the R. E. Ginna Nuclear Power Plant (Reference 1, Attachment 2, para. 12). 2/23/82 [8]<sup>(2)</sup>
  - c. SEP Topic XV-6 (Reference 1, Attachment 2, para. 12). 2/23/82 [8]<sup>(2)</sup>
  - d. Letter, J. E. Maier to D. M. Crutchfield, dated Dec. 15, 1980 addressing concerns identified in TER Section 4.6.2 (Reference 1, Attachment 2, para. 29).
  - e. SEP Topic VIII-4 including transmittal letter, D. M. Crutchfield to J. E. Maier, dated March 30, 1981 (Reference 1, Attachment 2, para. 30). 2/23/82 [8]<sup>(2)</sup>
  - f. A steam line break analysis which is a part of SEP Topics VI-2.d and VI-3 (Reference 1, Attachment 2, para. 33). 2/23/82 [8]<sup>(2)</sup>
2. Eleven equipment items have been defined [1] as equipment which will be replaced by June 1982. Identify the new equipment and supporting qualification documentation, if known, at this time. (Reference 1, Attachment 2, paragraphs 11.a, 11.c, 18, 23, 26, 27, 32, 35, 36, 37). 2/23/82 [8]<sup>(2)</sup>

\*\*\*This column will be completed by FRC as the requested information is received.



## B. FRC REVIEW OF INSTALLED TMI ACTION PLAN ITEMS

## INFORMATION REQUESTED

DATE RECEIVED BY FRC\*\*\*

1. Reference 2 does not provide sufficient detail with respect to TMI Action Plan equipment installed as of 1/1/81.
- a. The above-referenced submittal identifies five equipment items installed as of 1-1-81. Identify any additional TMI Action Plan equipment installed as of 1/1/81. 11-6-81 [6]<sup>(1)</sup>
- b. Identification of TMI Action Plan equipment installed with implementation dates after 1/1/81 is requested. 11-6-81 [6]<sup>(1)</sup>
- c. The correlation of these equipment items with the specific sections of NUREG-0737 [5] presented below (as applicable) is requested. 11-6-81 [6]<sup>(1)</sup>
- II.E1.2, IIE.4.2, II.E3.1, II.G1,  
II.F2, II.D3, IIK3.12(Wx),  
IIK3.9(Wx), II.B3, IIE.4.1.
- [The correlation is needed to ensure that all items are included in the review, e.g., if a transmitter is identified as a TMI Action Plan item, are the cable and terminal blocks associated with the device also identified?]
- d. For all installed TMI Action Plan equipment identified, a System Component Evaluation Worksheet (SCEW) (in accordance with 79-01B format or equivalent) is requested. This should include such things as equipment location, operating time, normal and accident environments, if different from previous values. 11-6-81 [6]<sup>(1)</sup>
- e. The approximate installation date for the TMI Action Plan equipment items is requested so that the appropriate qualification criteria (NUREG-0588 or DOR Guidelines) can be used in the EEQ evaluation. 11-6-81 [6]<sup>(1)</sup>

DATE RECEIVED BY FRC\*\*\*

2. The qualification documents, if new or different from previous submittals, 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.]

11-6-81 [6]<sup>(1)</sup>

3. Where the Licensee has a standard Owners' Group position with respect to a NUREG-0737 technical area or has requested extensions of implementation dates, this information is requested in order to incorporate it into the review.

11-6-81 [6]<sup>(1)</sup>

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. J. E. Maier  
Letter to D. M. Crutchfield (NRC)  
Subject: Environmental Qualification of Safety Related Electrical Equipment, R.E. Ginna (Response to NRC's SER and FRC TER-C5257-178)  
Rochester Gas & Electric Corp., 04-Sept-81
2. J. E. Maier  
Letter to D. G. Eisenhut (NRC)  
Subject: Environmental Qualification of Electrical Equipment, R.E. Ginna Nuclear Power Plant  
Rochester Gas & Electric Corp., 30-Jan-81
3. Telephone Memorandum  
From C. J. Crane (FRC) to G. Robel, P. Wilkinson  
Subject: Request for TMI Action plan information  
02-Oct-81
4. Office of Nuclear Reactor Regulation  
Safety Evaluation Report for R.E. Ginna Plant;  
Environmental Qualification of Safety-Related  
Electrical Equipment  
NRC, 01-June-81
5. NUREG-0737, "Clarification of TMI Action Plan Requirements"  
NRC, November 1980
6. J. E. Maier  
Letter to D. M. Crutchfield (NRC)  
Subject: Environmental Qualification of Electrical Equipment,  
R. E. Ginna Nuclear Power Plant; Submittal of Information for FRC  
Review  
Rochester Gas & Electric Corp., 06 Nov-81<sup>(1)</sup>
  - 6.1 C. J. Reinhardt  
Environmental Qualification Report on Pressurizer Safety Valve  
Position Indication System, Ginna Station; Direct Indication of  
Valve Position  
Rochester Gas & Electric Corp., 31-Oct-80<sup>(1)</sup>
  - 6.2 J. J. Patsey and E. L. Solem  
Tests of Limit Switch #138-90  
Acme Cleveland Dev. Co., 15-Feb-80  
T.R. 3613-PP<sup>(1)</sup>

- 6.3 E. J. Namiotko  
Qualification Test Report for IEEE Class Class 1E Solenoid Valves  
Valcor Engineering Corp., 05-Jul-79  
QR52600-5940-2, Proprietary<sup>(1)</sup>
- 6.3.1 M. M. Gillen  
Seismic Vibration Test Program Performed on Three  
Solenoid Valves, Part Numbers V52600-5940-2A,  
V52600-6042-1 and V52600-5291-2, Serial Numbers 20,  
24 and 8  
Dayton T. Brown, 03-Oct-79  
DTB04R79-0765, Rv<sup>(1)</sup>
- 6.3.2 E. J. Namiotko  
Report on the Thermal and Radiation Effects on P-33310  
Carbon Compound  
Valcor Engineering Corp., 09-Jan-79<sup>(1)</sup>
- 6.3.3 E. J. Namiotko  
Establishing a Thermal Aging Rate for Non-Metallic  
Materials Used in the Construction of Solenoids Valves  
Valcor Engineering Corp., 23-Apr-79  
MR 52600-515-2<sup>(1)</sup>
- 6.3.4 D. Groves  
Letter to B. J. Quail, Valcor. Subject: Test Summary of  
a Life Cycle Test on a Pilot Assist Valve V54000-30  
Combustion Engineering, Inc., 08-Apr-74<sup>(1)</sup>
- 6.3.5 E. J. Namiotko  
Bi-Axial Sinusoidal Seismic Qualification Test Procedure  
Valcor Engineering Corp., 26-Sep-78  
S-1424, Rev. A, GEN/TR/Valcor Fn<sup>(1)</sup>
- 6.3.6 E. J. Namiotko  
Qualification Test Report for IEEE Class 1E Solenoid  
Valve R/N V52600-515, Valve Type I  
Valcor Engineering Corp., 03-Apr-79  
GR52600-515, Rev. A<sup>(1)</sup>
- 6.3.6.1 S. J. Franklin  
Seismic Vibration Test Program Performed on One  
Solenoid Valve, Part Number V52600-515  
Dayton T. Brown, 20-Jun-77  
DTB04R77-0848<sup>(1)</sup>

- 6.3.6.2 N. M. Burstein  
Radiation Exposure and Simulated LOCA/DBE  
Isomedix Inc., 00-Aug-77  
IFR-V877-01<sup>(1)</sup>
- 6.3.6.3 General Test Procedure for Nuclear Solenoid  
Valves  
Valcor Engineering Corp., 27-Sep-77  
S-1602, Rev. F<sup>(1)</sup>
- 6.3.6.4 General Qualification Test Procedure for Class  
1E Nuclear Service Valves  
Valcor Engineering Corp., 21-Sep-77  
S-1410, Rev. E<sup>(1)</sup>

7. W. C. Gangloff and W. D. Loftus  
An Evaluation of Solid State Logic Reactor Protection in Anticipated  
Transients  
Westinghouse, 00-Jul-71  
WCAP-7706-L, Proprietary<sup>(1)</sup>

8. J. E. Maier  
Letter to D. M. Crutchfield, NRC. Subject: Environmental  
Qualification of Electrical Equipment, R. E. Ginna Nuclear Power  
Plant; Request for Additional Information  
Rochester Gas and Electric, 18-Feb-82<sup>(2)</sup>