



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

AUG 03 1984

Ms. Ophelia G. Williams  
J/R/A Associates  
Regulatory Information and Support Systems  
1304 Redditch Court  
Largo, MD 20772

IN RESPONSE REFER  
TO FOIA-84-262

Dear Ms. Williams:

This is in further response to your letter dated April 5, 1984, in which you requested, pursuant to the Freedom of Information Act, a copy of the site audits of environmental qualification of equipment at the following plants since October 1982:

- Waterford 3 (1/4 - 6/83)
- Midland 1 (1/11 - 13/83)
- Perry 1 (1983)
- Catawba 1 (3/84)
- Zimmer 1 (1983)
- Palo Verde 1 (1983)
- Clinton 1 (1983)
- Wolf Creek (5/83)
- WPPSS 2 (1983)

Appendix A is a list of documents which address audits for: WPPSS 2, Wolf Creek, Palo Verde, and Midland. These documents, other than item five, are presently in the PDR. You may obtain access to these documents by referencing the accession number listed on the Appendix. Item five is being placed in the PDR in file folder 84-262.

Additionally, document six is an internal memorandum containing the results of an audit conducted at TMI on March 20-21, 1984, with the results not yet finalized. This document does not contain any reasonably segregable factual portions. Release of this document would tend to inhibit the open and frank exchange of ideas essential to the deliberative process. The document reflects the predecisional process and, therefore, is exempt from mandatory disclosure pursuant to Exemption (5) of the Freedom of Information Act (5 U.S.C. 552(b)(5)) and 10 CFR 9.5(a)(5).

Pursuant to 10 CFR 9.9 of the Commission's regulations, it has been determined that the information withheld is exempt from production or disclosure and that its production or disclosure is contrary to the public interest. The persons responsible for this denial are the undersigned and Mr. Harold R. Denton, Director, Office of Nuclear Reactor Regulation.

8502090665 840803  
PDR FOIA  
WILLIAM84-262 PDR

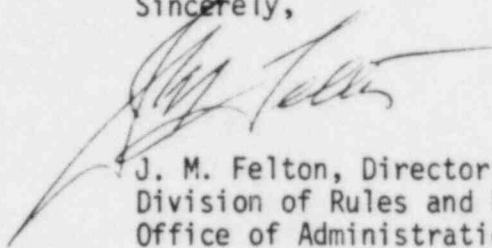
Ms. Ophelia G. Williams

-2-

This denial may be appealed to the Commission's Executive Director for Operations within 30 days from the receipt of this letter. As provided in 10 CFR 9.11, any such appeal must be in writing, addressed to the Executive Director for Operations, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and should clearly state on the envelope and in the letter that it is an "Appeal from an Initial FOIA Decision."

This completes NRC's action on your request.

Sincerely,

A handwritten signature in black ink, appearing to read "J. M. Felton", is written over the typed name and title.

J. M. Felton, Director  
Division of Rules and Records  
Office of Administration

Enclosure: Appendix A

APPENDIX A

1. 4/20/83 NUREG-0892, Supplement 3, May 1983 - Accession No. 8306010043 (PDR) (46 pages); Supplement 4, December 1983 - Accession No. 8401040036 (PDR) (142 pages); and Supplement 5, April 1984 - Accession No. 8404240005 (PDR) (41 pages)
2. NUREG-0881, Supplement 4, December 1983 - Accession No. 8401090322 (PDR) (91 pages)
3. NUREG-0857, Supplement 5, Appendix B - Accession No. 8312090366 (PDR) (61 pages)
4. NUREG-1002, November 1983, Section 3.11 - Accession No. 8312280092 (PDR) (100 pages)
5. 7/7/83 Meeting Summary prepared by Darl Hood
6. 4/6/84 Memorandum for John F. Stolz from Vincent S. Noonan, Subject: "Results of Electrical Equipment Environmental Qualification Audit for Three Mile Island - Unit 1"

J./R./A

J/R/A/ ASSOCIATES

Regulatory Information and Support Systems

1304 REDDITCH COURT, LARGO, MARYLAND 20772 (301) 336-4982

April 5, 1984  
OGW-84-026

Mr. J.M. Felton, Director  
Division of Rules and Records  
Office of Administration  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

FREEDOM OF INFORMATION  
ACT REQUEST

FOIA-84-262  
Rec'd 4-9-84

Dear Mr. Felton:

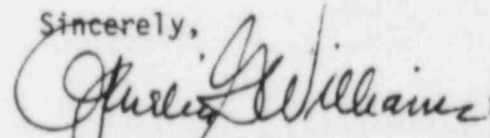
Research of docket files at the Public Document Room of the NRC indicates that site audits were held of environmental qualification of equipment at the following plants:

- Waterford 3 (1/4 - 6/83) 382
- Midland 1 (1/11 - 13/83) 329
- Perry 1 (1983) 440
- Catawba 1 (3/84) 413
- Zimmer 1 (1983) 358
- Palo Verde 1 (1983) 528
- Clinton 1 (1983) 461
- Wolf Creek (5/83) 482
- WNP 2 (1983) 297

Pursuant to the Freedom of Information Act, I am herein requesting that reports resulting from those audits be placed in the Public Document Room. Additionally, I would like to view any and all reports from audits held since October 1982.

Thank you.

Sincerely,



Ophelia G. Williams

850118 0051

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**ROUTING AND TRANSMITTAL SLIP**

Date

8-3

TO: (Name, office symbol, room number, building, Agency/Post)

Initials

Date

1.

Chris

2.

3.

4.

5.

Action	File	Note and Return
Approval	For Clearance	Per Conversation
As Requested	For Correction	Prepare Reply
Circulate	For Your Information	See Me
Comment	Investigate	Signature
Coordination	Justify	

**REMARKS**

Pls attach this to  
84-262 (8-3 Lt1)  
This is the released  
document.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)

Room No.—Bldg.

Phone No.

5041-102

GPO : 1981 O - 365-529 (148)

OPTIONAL FORM 41 (Rev. 7-76)  
Prescribed by GSA  
FPMR (41 CFR) 101-11.206

Mary Jean

July 8, 1983

DISTRIBUTION:  
Docket Nos. 50-330  
NRC PDR  
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PRC System  
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MMiller  
EAdensam  
MDuncan  
Attorney, OELD  
JSniezak, I&E  
JStone, I&E  
ACRS (16)

Docket Nos: 50-330

Mr. J. W. Cook  
Vice President  
Consumers Power Company  
1945 West Parnall Road  
Jackson, Michigan 49201

Dear Mr. Cook:

Subject: Preliminary Safety Evaluation Report and Audit  
Summary on Environmental Qualification of Electric  
Equipment Important to Safety and Safety-Related  
Mechanical Equipment for Midland Unit 2

The enclosed Safety Evaluation Report addresses the environmental qualification program for electrical equipment important to safety as defined in 10 CFR 50.49 for Midland Unit 2. This review was conducted in accordance with the requirements of 10 CFR 50.49 and the guidance in NUREG-0588 and Section 3.11 of NUREG-0800.

The staff requires that outstanding information identified in SER Sections 3.11.3 and 3.11.4 be provided as indicated in the conclusions of this preliminary SER. A principal objective of this transmittal is to provide for expeditious resolution of open items prior to inclusion of this matter in a future supplement. If Consumers deems a meeting or telephone conference necessary to discuss open items with the NRC staff, inform Melanie Miller, at (301) 492-4259, within one week of receipt of this letter. Your comments, including schedules for completion of any further analyses or other work associated with resolution of open items, are requested prior to any scheduled meeting or telephone conferences.

The enclosed preliminary SER, in part, describes the environmental qualification audit conducted by NRR and its consultant on January 11-13, 1983. Hence, the enclosure also serves as NRC's meeting summary for the January 11-13, 1983 audit.

Sincerely,

Thomas M. Novak, Assistant Director  
For Licensing  
Division of Licensing

Enclosure:  
As stated

*83-719-423 PDR*

cc: See next page

OFFICE	DL:LB #4	DL:LB #4	LA:DL:LB #4	DL:LB #4	AD:DL		
SURNAME	MMiller/hmc	DHood	MDuncan	EAdensam	TNovak		
DATE	6/27/83	6/27/83	6/27/83	6/16/83	7/14/83		





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

July 8, 1983

Docket Nos: 50-330

Mr. J. W. Cook  
Vice President  
Consumers Power Company  
1945 West Parnall Road  
Jackson, Michigan 49201

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Sincerely,

A handwritten signature in cursive script, appearing to read "Tom Novak".

Thomas M. Novak, Assistant Director  
For Licensing  
Division of Licensing

Enclosure:  
As stated

cc: See next page

~~8307190423~~



MIDLAND

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DRAFT

ENCLOSURE 1  
SAFETY EVALUATION REPORT  
OFFICE OF NUCLEAR REACTOR REGULATION

MIDLAND UNIT 2  
DOCKET NO. 50-330

3.11 Environmental Qualification of Electric Equipment Important to Safety and Safety Related Mechanical Equipment

3.11.1 Introduction

Equipment which is used to perform a necessary safety function must be demonstrated to be capable of maintaining functional operability under all service conditions postulated to occur during its installed life for the time it is required to operate. This requirement, which is embodied in General Design Criteria 1 and 4 of Appendix A and Sections III, XI, and XVII of Appendix B to 10 CFR 50, is applicable to equipment located inside as well as outside containment. More detailed requirements and guidance relating to the methods and procedures for demonstrating this capability has been set forth in 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," and NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment." This NUREG supplements IEEE Standard 323, and various NRC Regulatory Guides and industry standards.

3.11.2 Background

NUREG-0588 was issued in December 1979 to promote a more orderly and systematic implementation of equipment qualification programs by industry and to provide guidance to the NRC staff for its use in ongoing licensing reviews. The positions contained in this report provide guidance on (1) how to establish environmental service conditions, (2) how to select methods which are

considered appropriate for qualifying equipment in different areas of the plant, and (3) other areas such as margin, aging, and documentation.

DRAFT

In February 1980 the NRC requested certain near term Operating License (OL) applicants to review and evaluate the environmental qualification documentation for each item of safety related electric equipment and to identify the degree to which their qualification programs comply with the staff positions discussed in NUREG-0588. IE Bulletin 79-01B "Environmental Qualification of Class 1E Equipment," issued January 14, 1980, and its supplements dated February 29, September 30, and October 24, 1980 established environmental qualification requirements for operating reactors. This bulletin and its supplements were provided to OL applicants for consideration in their review.

A final rule on environmental qualification of electric equipment important to safety for nuclear power plants became effective on February 22, 1983. This rule, Section 50.49 of 10 CFR Part 50, specifies the requirements to be met for demonstrating the environmental qualification of electrical equipment important to safety located in a harsh environment. In accordance with 10 CFR 50.49, the electrical equipment in Midland Units 1 and 2 may be qualified in accordance with the acceptance criteria specified in Category II of NUREG-0588.

The qualification requirements for mechanical equipment are principally contained in Appendices A and B of 10 CFR 50. The qualification methods defined in NUREG-0588 can also be applied to mechanical equipment.

In order to document the degree to which their environmental qualification program complies with NRC's environmental qualification requirements and criteria, the applicant provided equipment qualification information by letters dated November 1981, April 30 and December 13, 1982, and February 17, 1983, to supplement the information contained in Section 3.11 of the FSAR.

#### 3.11.2.1 Purpose

The purpose of this SER is to evaluate the adequacy of Midland Units 1 and 2 environmental qualification program for electric equipment important to

safety as defined in 10 CFR 50.49, and for safety-related mechanical equipment. The staff position relating to open items, as well as any unresolved issues, is provided in this report.

3.11.2.2 Scope

The scope of this report includes an evaluation of the completeness of the list of systems and equipment to be qualified, the criteria which they must meet, the environments in which they must function, and an assessment of the qualification documentation for the equipment. The principal area of review was the qualification of safety-related equipment which must function in order to prevent or mitigate the consequences of a loss-of-coolant accident (LOCA) or high energy line break (HELB) inside or outside of containment, while subjected to the harsh environments associated with these accidents.

3.11.3 Staff Evaluation

The staff evaluation of the applicant's environmental qualification program included an onsite examination of equipment, audits of qualification documentation, and a review of the applicant's submittals for completeness and acceptability of systems and components, qualification methods, and accident environments. The criteria described in NUREG-0800, Section 3.11, Rev. 2 and NUREG-0588 Category II form the basis for the staff evaluation of the adequacy of the applicant's qualification program. Revision 1 of NUREG-0588 was utilized to clarify staff positions as required.

The staff performed an audit of the applicant's qualification documentation and installed electrical equipment on January 11-13, 1983. The audit consisted of a review of 11 files containing equipment qualification documentation. The staff's finding during the audit are discussed in detail in Section 3.11.4.2. of this report.

3.11.3.1 Completeness of Equipment Important to Safety

The applicant was directed to (1) establish a list of systems and components located in a harsh environment that are required to prevent or mitigate a LOCA

or a HELB and (2) identify components needed to perform the function of safety-related display instrumentation, post-accident sampling and monitoring, and radiation monitoring.

The applicant's systems list and safety function(s) for the environmental qualification program was provided and is included as Appendix D of this report. However, the applicant must provide a comparison between each of the systems listed in Appendix D and those listed in Table 3.2.1 of the FSAR. Justification should be provided for the exclusion of safety-related system(s) in Table 3.2.1 from the environmental qualification program (e.g. not required for accident mitigation, all components located in a mild environment, etc.).

The applicant has identified the equipment required by NUREG-0737, "Clarification of TMI Action Plan Requirements", but the qualification status has not been established for all items. Prior to granting of an operating license, the applicant should identify the qualification status for all TMI Action Plan equipment. For any TMI Action Plan equipment not yet installed and that will not be installed prior to operation, a description of the plans for qualification, including the schedule for completion of qualification, must be submitted. (All TMI Action Plan equipment currently installed or that will be installed prior to operation must be qualified or justifications for interim operation provided prior to granting of an operating license, in accordance with 10 CFR 50.49.)

To comply with 10 CFR 50.49, the following information must be submitted by the applicant prior to granting of an operating license.

- (a) A list of all nonsafety-related electrical equipment, located in a harsh environment, whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions by the safety-related equipment. A description of the methods used to identify this equipment must also be included. The nonsafety-related equipment identified must be included in the environmental qualification program.



- (b) A statement that all safety-related electrical equipment in a harsh environment, as defined in the scope of 10 CFR 50.49, is included in the list of equipment identified in the December 1982 submittal (the systems list discussed in Section 3.11.3.1 should be taken into consideration in this statement).
- (c) a list of all post-accident monitoring equipment currently installed, or that will be installed prior to plant operation, that is specified as Category 1 and 2 in Revision 2 of Regulatory Guide 1.97 and is located in a harsh environment. The equipment identified must be included in the environmental qualification program.

The Applicant's equipment qualification program does include the equipment required by Reg. Guide 1.97. However, all items installed or to be installed prior to the granting of an operating license must be qualified or justification for interim operation must be provided.

### 3.11.3.2 Qualification Methods

#### 3.11.3.2.1 Electrical Equipment in a Harsh Environment

Detailed procedures for qualifying safety-related electrical equipment in a harsh environment are defined in NUREG-0588. The criteria in this NUREG are also applicable to other equipment important to safety defined in 10 CFR 50.49. Type testing of equipment in a sequence consisting of pre-aging, seismic and dynamic loading, and exposure to LOCA/HELB conditions (where applicable) is the preferred method of qualification. However, in some cases the applicant has extrapolated partial test data to establish the equipment qualification.

For several items of equipment in the containment, the applicant utilized thermal lag analysis for qualification to the short term, high temperatures of main steam line breaks. For tests already completed, NUREG-0588 permits analysis to supplement LOCA test data to demonstrate qualification for MSLB's. The staff has reviewed this analysis and finds the approach utilized to be acceptable.



3.11.3.2.2 Safety-Related Mechanical Equipment in a Harsh Environment

Although there are no detailed requirements for mechanical equipment, General Design Criteria 1, "Quality Standards and Records," and 4, "Environmental and Missile Design Bases;" Appendix B to 10 CFR 50, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Section III, "Design Control" and XVII, "Quality Assurance Records;" and SRP Section 3.11, Revision 2 contain the following requirements related to equipment qualification:

- o Components shall be designed to be compatible with the postulated environmental conditions, including those associated with Loss-of-coolant accidents.
- o Measures shall be established for the selection and review for suitability of application of materials, parts, and equipment that are essential to safety-related functions.
- o Design control measures shall be established for verifying the adequacy of design.
- o Equipment qualification records shall be maintained and shall include the results of tests and materials analyses.

The staff review is concentrated on materials which are sensitive to environmental effects, for example, seals, gaskets, lubricants, fluids for hydraulic systems, and diaphragms. An audit of qualification documentation was conducted by the staff, whereby the approach to qualification was found acceptable to verify conformance with the above criteria. However, prior to granting of an operating license the applicant should submit the results of the review performed for all safety-related mechanical equipment located in areas of potentially harsh environments, including a description of any problems that were identified and the corrective actions taken. Justifications for interim operation, based on the considerations specified in 10 CFR 50.49(i), must be provided for all equipment whose qualification cannot be established prior to granting of an operating license.

### 3.11.3.3 Service Conditions

NUREG-0588 defines the methods to be utilized for determining the environmental conditions associated with loss-of-coolant accidents or high energy line breaks, inside or outside containment. The review and evaluation of the adequacy of these environmental conditions are described below. The staff has reviewed the qualification documentation to ensure that the qualification conditions envelop the conditions established by the applicant.

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

The applicant provided the LOCA/MSLB profiles used for equipment qualification. The peak values resulting from these profiles are as follows:

	<u>Maximum Temperature °F</u>	<u>Maximum Pressure, psig</u>	<u>Humidity, %</u>
LOCA	320	70	100
MSLB	465	60	100

The staff has reviewed these profiles and finds them acceptable for use in equipment qualification; i.e., there is reasonable assurance that the actual pressures and temperatures will not exceed these profiles anywhere within the specified environmental zone (except in the break zone).

#### 3.11.3.3.2 Temperature, Pressure, and Humidity Conditions Outside Containment

High-energy piping system failures are discussed in FSAR Section 3.6. The applicant has provided pressure temperature and humidity conditions associated with high energy line breaks outside containment. However, Table 1-6 of the equipment qualification (EQ) submittal shows a maximum temperature of 104°F under accident conditions for areas outside containment. Table 1-6 also indicates (in note 5) that maximum accident temperatures are under evaluation. In the EQ submittal, subsection 1.4.3.2.2 and Figures 1-28 through 1-34 shows a maximum accident temperature of 212°F that drops to 140°F after 27.7 hours.

Because of these inconsistencies, environmental conditions outside containment is and will remain an open item until the applicant can state specifically and consistently the various conditions.

The applicant stated that the maximum specified room temperature following a loss of HVAC are currently being verified. However, the applicant must identify the temperature environment base on a LOCA/HELB with a loss of offsite power for plant areas that are not served by Class 1E HVAC systems. The temperature rise effects from a loss of HVAC must be included in the environmental review for accident monitoring and post accident monitoring (AM/PAM) equipment required during and following a LOCA or HELB.

#### 3.11.3.3.3 Submergence

The maximum submergence levels have been established by the applicant in the environmental qualification program. The maximum calculated water level inside containment established by the applicant is 603 ft. Equipment located below this level has been evaluated for submergence qualification. The effects of flooding on safety-related equipment outside containment are discussed in Sections 3.4 and 3.6 of the FSAR and in the applicant's environmental qualification program. The applicant stated that design changes were made subsequent to a flooding analysis conducted in 1977, and that a new flooding study is currently being undertaken to verify the results of the old study. The applicant also stated that flooding shall not prevent the ability to achieve and maintain a stable cold shutdown condition. Therefore, flooding is and shall remain unresolved pending the completion of the study currently being conducted by the applicant that must confirm that all equipment important to safety subjected to submergence is or will be qualified for submergence or for the time duration necessary for it to complete its safety function. This issue must be resolved prior to the granting of an operating license.

#### 3.11.3.3.4 Chemical Spray

Chemical spray is available for containment heat removal following a design basis accident. The specified composition of the spray is 13000-14,130 PPM boric acid buffered with disodium phosphate with hydrazine added for iodine

removal, with a pH of 4.5-7.5. Equipment inside containment was reviewed for qualification under the above conditions.

#### 3.11.3.3.5 Aging

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

In addition to the above, a maintenance/surveillance program should be implemented to identify and prevent significant age-related degradation in electrical and mechanical equipment. The applicant has committed to follow the recommendations in Regulatory Guide 1.33, Revision 2, "Quality Assurance Program Requirements (Operation)," which endorses American National Standard ANS-3.2/ANSI N18.7-1976, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants," as noted in Section 17 of the staff SER for Midland Plant Units 1 and 2 (NUREG-0793). This standard defines the scope and content of a maintenance/surveillance program for safety-related equipment. Provisions for preventing or detecting age-related degradation in safety-grade equipment are specified and include a) utilizing experience with similar equipment, b) revising and updating the program as experience is gained with the equipment during the life of the plant, c) reviewing and evaluating malfunctioning equipment and obtaining adequate replacement components, and d) establishing surveillance tests and inspections based on reliability analyses, frequency and type of service, or age of the items, as appropriate. A commitment to implementation prior to granting of an operating license must be made by the applicant and will be verified by the staff. The outline of this program is acceptable for the purposes of the environmental qualification program.

### 3.11.3.3.6 Radiation (Inside and Outside Containment)

The applicant has provided values for the radiation levels postulated to exist following a LOCA. The application and methodology employed to determine these values were presented to the applicant in NUREG-0588 and NUREG-0737, "Clarification of TMI Action Plan Requirements." The staff review determined that the values to which equipment was qualified enveloped the requirements identified by the applicant.

The values specified for use in equipment qualification in the containment are total integrated doses (gamma and beta) ranging from  $6.6 \times 10^5$  to  $2.9 \times 10^8$  rads. In the auxiliary building, total integrated doses of up to  $1.96 \times 10^8$  rads were specified. The applicant provided sample calculations that were reviewed by the staff and found acceptable. Consequently, the values presented here are acceptable for use in the qualification of equipment.

### 3.11.3.4 Outstanding Equipment

For all items not having complete qualification documentation, the applicant must provide commitments for corrective action and schedules for completion. For items that will not have full qualification prior to granting an operating license, an analysis must be performed in accordance with the requirements of Paragraph (i) of 10 CFR 50.49 to ensure that the plant can be operated safely pending completion of environmental qualification. The analyses must be submitted for staff review and approval prior to the granting of an operating license.

### 3.11.4 Qualification of Equipment

The following subsections present the staff's assessment of equipment based on the applicant's submittal, audits of documentation at the plant site, information in the NRC Equipment Qualification Data Bank, and previous staff evaluations of equipment in other plants.



9/2/87

3.11.4.1 Electrical Equipment in a Harsh Environment

The staff has separated the electrical equipment in a harsh environment into three categories: (1) equipment demonstrated to be not qualified, (2) equipment requiring additional qualification information or corrective action, and (3) equipment considered acceptable pending implementation of the maintenance and surveillance program. An appendix listing equipment in each of these categories is provided.

3.11.4.1.1 Equipment Demonstrated to be Not Qualified

Appendix A identified equipment which has been demonstrated to be not qualified. There is no equipment in this category for Midland Units 1 and 2.

3.11.4.1.2 Equipment Requiring Additional Information and/or Corrective Action

Appendix B identifies equipment in this category. Corrective action or deficiencies are noted by a letter relating to the legend identified below.

Legend

- A - material-aging evaluation; replacement schedule; ongoing equipment surveillance
- CS - chemical spray
- EXN - exempted equipment justification inadequate
- H - humidity
- I - HELB evaluation outside containment not completed
- M - margin
- P - pressure
- QI - qualification information being developed
- QM - qualification method
- QT - qualification time
- R - radiation
- RPS - equipment relocation or replacement schedule provided
- RPN - equipment relocation or replacement schedule not provided

- RTS - retest, schedule provided
- S - submergence
- SEN - separate effects qualification justification inadequate
- T - temperature
- QC - qualification criteria (Category II in lieu of Category I)

These deficiencies do not necessarily mean that the equipment is unqualified. However, the deficiencies are cause for concern and require further case-by-case evaluation. The applicant should resolve these deficiencies and document the resolutions in an auditable form.

#### 3.11.4.1.3 Equipment Considered Acceptable or Conditionally Acceptable

Based on the staff review, the items identified in Appendix C have been determined to be acceptable, pending implementation of the maintenance/surveillance program.

#### 3.11.4.2 Environmental Qualification Audit

The staff, together with its consultant EG&G of Idaho, performed an audit of the applicant's qualification documentation on January 11-13, 1983. The audit consisted of a review of 11 files containing information regarding equipment qualification. In general the staff was in agreement with the findings by the applicant regarding the qualification status of the equipment. Based on the review of the files, the following observations and comments were made by the staff:

- (1) The staff agreed to accelerate review efforts on the thermal equivalence analysis provided to the staff during the audit.
- (2) The staff also agreed to complete the review of the applicant's chemical spray analysis at the earliest possible date.



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- (3) Applicant committed to update all files to include NSSS test reports or test report summaries as appropriate.
- (4) Generic writeups must be revised or an explanation should be provided in test reports for all equipment that has the potential for exposure to a high energy line break (HELB) and are not required for that event. In addition, Table 1-6 must be revised to list the appropriate curve(s) for all equipment which are required for a HELB.
- (5) The staff suggested that, upon completion of the field verification report (currently in draft form), the applicant should incorporate copies of the applicable pages into the corresponding EQ files.
- (6) The staff noted that discussions on maintenance restrictions on qualification has been centrally located. This should help to avoid confusion that could develop in the absence of these centrally located files.
- (7) As stated above, 11 files were audited, however, it was determined that one file, (M1.35C) RTD and Connector Head, should be removed from the harsh environment qualification program and that the applicant's EQ submittal should be updated to reflect this change. The applicant must document that this equipment is not required to perform a safety function during or after any design basis accident, and also must determine that the failure of this equipment will have no effect on other safety-related equipment, nor mislead the operator.

The following comments are specific to individual files as indicated. However, the applicant should update all files to incorporate these comments where applicable.

(M-54A) Reactor Building Spray Pump Motors

- (a) Add surveillance requirement for the motor windings based on the humidity requirement.

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- (b) Reference for humidity qualification of lubricant should be revised from reference 4 to the appropriate reference in the file (from ref. 4 to ref. 6).
- (c) Files should be revised to indicate that the seals are metallic.
- (d) Files should be updated to indicate that reference 7 curves are the appropriate curves instead of Reference 2 curves.
- (e) There should be an explanation regarding the exemption from the HELB environment for this equipment.

(M-163A) Recirculation Air-Cooling Unit Motors

Three failures are listed as unknown (Reference 2, Appendix D, page 1). A copy of the telex from the vendor, stating that the three failures are not related to problems with the test specimen(s) but are the result of other causes, should be added to the files.

(J-255A) Valve Operators

The applicant has committed to revise the information on the Equipment Environmental Qualification Sheet (EEQS) to conform to the test documentation (i.e., model number, temperature, pressure). The applicant has also agreed to revise the EQ submittal to reflect these changes.

(F-002A) Terminal Block (States)

The applicant has stated that the location of this component(s) in a harsh environment cannot "presently" be determined. This will remain an open item until the location and correct installation is verified by the NRC resident inspector, or until the applicant certifies that this component(s) is not installed in a harsh environment.

## E-020A Electrical Penetration Assembly (Amphenol)

Prior to accepting this file as qualified, the applicant should review the applicability of IE Bulletin 82-04 and incorporate the resolution in the EQ files.

In addition to the six files noted above the following were also audited.

- (E22A) Low Voltage Power Cable
- (E26B) 600V Control Cable Rework
- (J-249A) Acoustic Flow Monitor
- (M1.35A) Differential Pressure Transmitters
- (E120A) Conax Penetration Modification

### 3.11.5 Conclusions

The staff has reviewed the Midland Unit 1 and 2 program for the environmental qualification of electric equipment important to safety and safety related mechanical equipment as noted in this report. The purpose of the review was to determine the adequacy of the program including the systems selected for qualification, the environmental conditions resulting from design basis accidents, and the methods used to demonstrate qualification.

The results of the review have been detailed in this report. The applicant must provide the required information, identified in Sections 3.11.3.1, 3.11.3.2.2, 3.11.3.3.2, 3.11.3.3.3, 3.11.3.3.5, and 3.11.3.4 of this report, to demonstrate full compliance with 10 CFR 50.49 and all applicable regulations. The qualification information should be provided to allow sufficient time for staff review and approval prior to issuance of an operating license.

Upon review of the required information a further supplement to this SSER will be issued.

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APPENDIX A  
EQUIPMENT DEMONSTRATED TO BE NOT QUALIFIED  
(Category 3.11.4.1.1)

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No equipment in this category

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APPENDIX B  
EQUIPMENT REQUIRING ADDITATION  
INFORMATION OR CORRECTIVE ACTION  
(Category 3.11.4.1.2)

EQUIPMENT ITEM	MANUFACTURER	MODEL NO.	DEFICIENCY/ CORRECTIVE ACTION
600 Volt Control Cable (E026A)	Rockbestos	C53-3098	A, M
600 Volt Control Cable (E026A)	Rockbestos	C51-3035	A, M
600 Volt Control Cable (E026A)	Rockbestos	C53-3099	A, M
600 Volt Control Cable (E026A)	Rockbestos	C53-3100	A, M
600 Volt Control Cable (E026A)	Rockbestos	C53-3101	A, M
600 Volt Control Cable (E026A)	Rockbestos	C53-3102	A, M
600 Volt Control Cable (E026A)	Rockbestos	C51-3034	A, M
600 Volt Control Cable (E026A)	Rockbestos	C51-3036	A, M
600 Volt Control Cable Insulation Rework KXL-750 (E026B)	Rockbestos	EQ Rework	A, M
600 Volt Control Cable Insulation Rework KXL-420 (E026C)	Rockbestos	Rework	A, M
Coaxial, Triaxial, and Twinaxial Cable (E056A)	Rockbestos	Rss-6-112	A, CS, T
(E056A)	Rockbestos	Rss-6-100	A, CS, T
(E056A)	Rockbestos	Rss-6-109	A, CS, T
600V Instrumentation Cable (E060A)	Rockbestos	C51-3125	A, M
Cable (E060A)	Rockbestos	C53-3289	A, M
Cable (E060A)	Rockbestos	C51-3125	A, M
Cable (E060A)	Rockbestos	C53-3288	A, M
Cable (E060A)	Rockbestos	C53-3290	A, M
Cable (E060A)	Rockbestos	146-3700	A, M
Cable (E060A)	Rockbestos	146-3700	A, M
Cable (E060A)	Rockbestos	146-3700	A, M
Cable (E060A)	Rockbestos	146-3701	A, M

APPENDIX B (Continued)

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EQUIPMENT ITEM	MANUFACTURER	MODEL NO.	DEFICIENCY/ CORRECTIVE ACTION
Cable (E060A)	Rockbestos	I46-3702	A,M
Cable (E060A)	Rockbestos	I46-3703	A,M
Cable (E060A)	Rockbestos	I46-3707	A,M
Cable (E060A)	Rockbestos	I46-3704	A,M
Cable (E060A)	Rockbestos	I46-3705	A,M
Cable (E060A)	Rockbestos	I46-3706	A,M
Cable (E060A)	Rockbestos	I67-3167	A,M
Cable (E060A)	Rockbestos	I67-3168	A,M
Cable (E060A)	Rockbestos	I67-3169	A,M
Cable (E060A)	Rockbestos	I46-3709	A,M
Cable (E060A)	Rockbestos	I67-3170	A,M
Cable (E060A)	Rockbestos	I67-3185	A,M
Cable (E060A)	Rockbestos	C53-3291	A,M
Cable (E060A)	Rockbestos	I46-3708	A,M
Cable (E060A)	Rockbestos	I46-5050	A,M
Insulation Rework For Instrumentation Cable KXL 760 (E060B)	Rockbestos	Rework	A,M
Insulation Rework For Instrumentation Cable KXL-420 (E060C)	Rockbestos	Rework	A,M
Resistance Temperature Detector Assemblies (J233A)	Weed Instrument Co.	512-180-C-6-C-22.75-C-0	QI
Resistance Temperature Detector Assemblies (J233A)	Weed Instrument Co.	512-180-C-6-C-20-C-0	QI
Resistance Temperature Detector Assemblies (J233A)	Weed Instrument Co.	512-18-C-3-C-12.5-C-0	QI
Resistance Temperature Detector Assemblies (J233A)	Weed Instrument Co.	512-8-C-3-C-12.5-C-0	QI



## APPENDIX B (Continued)

EQUIPMENT ITEM	MANUFACTURER	MODEL NO.	DEFICIENCY/ CORRECTIVE ACTION
Radiation Monitoring System (J244A)	Victoreen	877-1	QI
Cable/Connector Assembly (J244B)	Victoreen	878-1	RPN
Flow Transmitter (J245A)	Rosemount	1153DD4	QI
Level Transmitter (J245A)	Rosemount	1153HD5	QI
Level Transmitter (J245A)	Rosemount	1153DD5	QI
Level Transmitter (J245A)	Rosemount	1153DD4	QI
Differential Pressure XMTR (J245A)	Rosemount	1153DD7	QI
Pressure Transmitter (J245A)	Rosemount	1153GD9	QI
Pressure Transmitter (J245A)	Rosemount	1153AD6	QI
Pressure Transmitter (J245A)	Rosemount	1153AD7	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-006	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-007	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-012	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-004	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-058	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-016	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-013	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-019	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-050	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-019	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-056	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-005	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-026	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-037	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-053	QI
Position Switch (J256A)	Gordos	Reed	QI
Solenoid Valve (J256A)	Target Rock Corp.	76B-057	QI
Level Switch (J278A)	Vitro	3118-1002	RTS
Level Switch (J278A)	Delaval-Dans	LC-85490	RTS
Level Monitor Probe (J297A)	Delaval-Dans	LM-84854	QI



## APPENDIX B (Continued)

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EQUIPMENT ITEM	MANUFACTURER	MODEL NO.	DEFICIENCY/ CORRECTIVE ACTION
Level Monitor Probe (J297A)	Delaval-Gems	XM-54852/53	QI
Valve Operator (L-DC-IN)	Limitorque	SB-0-15-1900	QI
Valve Operator (L-DC-OUT)	Limitorque	SMB-0-25-1900	QI
Temperature Thermostat (M349A)	Pen Controls	A19 24C6	RPS
Fission Chamber (JC-100A)	Gamma-Metrics	RCS 400A	QI
PAM Connector (JC-100B)	Amphenol	52975-1051	QI
PAM Connector (JC-100B)	Amphenol	53250	QI
Cable (JC-100B)	Gamma-Metrics	200040	QI
Position Switch (M1.11A)	Target Rock Corp.	8100-001	QI
PCRV (M1.11A)	Target Rock Corp.	8100-001	QI
Connection Kit (E-Ray A)	RAYCHEM	NMCK (Motor Conn Kit)	A,M
Heat Shrink Tubing (E-Ray B)	RAYCHEM	WCSF-N	A,T,M
Pressurizer Heaters (M1.10A)	Weigand	14KW- 1100786-0	QI
Pwr Heater Connector Assy. (M1.10B)	Gulton	1120150D	QI
480V AC Power Panel (E45A)	Square D Company	Type HCN NEMA 12	QI
Valve Operator (J255A)	ITT General Controls	N-91	A,T,M
Valve Operator (J255A)	ITT General Controls	N-93	A,T,M
Motor (Pump) (M255A)	Westinghouse	SBDP	RPN
Chiller (Aux. Prog. Safeguards) (M245A)	Carrier	18FA443-1012	QI
Local Control Station (E134A)	Gould/Brown Boveria	Vendor Print 7220-EB4-8-2	RPN
Local Control Station (E034A)	Gould/Brown Boveria	Vendor Print 7220-EB4-10-2	RPN
Solenoid Valve (M116B)	Keane	132SS-115-000-E	QI
Position Switch (M116B)	NAMCO Controls	EA-740-60100	RPS
Position Switch (M116AB)	NAMCO Controls	EA-170-12302	RPS

## APPENDIX B (Continued)

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EQUIPMENT ITEM	MANUFACTURER	MODEL NO.	DEFICIENCY/ CORRECTIVE ACTION
Position Switch (123CD)	NAMCO Controls	EA 180-11302	RPN
Position Switch (123CD)	NAMCO Controls	EA 180-12302	RPN
Solenoid Valve (M125CC)	ASCO	8302D26RU	QM, T
Limit Switch (125CD)	Honeywell	DTF2-2RN	RPS
Fan Motor (M149A)	Westinghouse	Type LLT/ 143T/.75/17	RPS
Fan Motor (M149A)	Westinghouse	Type LLT/ 182T/3/1725	RPS
Fan Motor (M149A)	Westinghouse	Type LLT/ 184T/5/1738	RPS
Fan Motor (M149A)	Westinghouse	Type LLT/ 184T/5/1735	RPS
Air Cooling Unit (M163A)	Joy Mfg.	P/N 600287-47	RPS
Pump Motor (Hydrazine) (M374A)	Reliance Electric	Type PB, Frame 182T	QM, T
Pump Motor (M1.16A)	General Electric	5K830947A7	A, T
Pump Motor (Decay Heat Removal) (M1.17A)	General Electric	5K811055A44	A, T
Neutron Flux Element (M1.31A)	Westinghouse	WL 23636B	M, A
Neutron Flux Connector (M1.31B)	Amphenol	50975-1051	M, A, T
RTD (M1.35C)*	Rosemount	177HW/79-235	
In-Core Thermocouple (M1.35D)	SELFAB		QI
In-Core Thermocouple Connector (M135E)	Cannon		QI
Electric Conductor Seal (3033A)	Conax	N-11003-09	A, T, QI
Electric Conductor Seal (3033A)	Conax	N-11003-11	A, T, QI
Electric Conductor Seal (3033A)	Conax	N-11003-39	A, T, QI
Local Control Station (E034A)	Gould, Brown Boverie	7220-E34-11-2	RPN
Local Control Station (E034A)	Gould, Brown Boverie	7220-E34-9-2	RPN
Terminal Block (F002A)**	Multi-AMP, States Div.	NT, 2AM	
Terminal Block (F011B)	General Electric	04151	QI

## APPENDIX B (Continued)

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EQUIPMENT ITEM	MANUFACTURER	MODEL NO.	DEFICIENCY/ CORRECTIVE ACTION
Terminal Block (F002B)	General Electric	CR2960	QI
Valve Operator (L-AC-IN)	Limatorque	SMB-00-5-3600	QI
Valve Operator (L-AC-IN)	Limatorque	SMB-00-5-1800	QI
Valve Operator (L-AC-IN)	Limatorque	SMB-000-5-1800	QI
Valve Operator (L-AC-IN)	Limatorque	SB-3-80-1800	QI
Valve Operator (L-AC-IN)	Limatorque	SB-3-80-3600	QI
Valve Operator (L-AC-IN)	Limatorque	SBD-3-175-3600	QI
Valve Operator (L-AC-IN)	Limatorque	SMB-0-25-1800	QI
Valve Operator (L-AC-IN)	Limatorque	SMB-0-25-3600	QI
Valve Operator (L-AC-IN)	Limatorque	SMB-00-25-1800	QI
Valve Operator (L-AC-IN)	Limatorque	SB-00-15-3600	QI
Valve Operator (L-AC-IN)	Limatorque	SMB-000-2-1800	QI
Valve Operator (L-AC-IN)	Limatorque	SMB-0-40-1700/ H48C	QI
Valve Operator (L-AC-IN)	Limatorque	SMB-0-40-1700/ H48C	QI
Valve Operator (L-AC-IN)	Limatorque	SMB-0-15-3600 H38C	QI
Valve Operator (L-AC-OUT)	Limatorque	SMB-000/2 H18C	QI
Valve Operator (L-AC-OUT)	Limatorque	SB-0-40-1800	QI
Valve Operator (L-AC-OUT)	Limatorque	SMB-0-40-1800	QI
Valve Operator (L-AC-OUT)	Limatorque	SB-015	QI
Valve Operator (L-AC-OUT)	Limatorque	SMB-00	QI
Valve Operator (L-AC-OUT)	Limatorque	SMB-01-15	QI
Valve Operator (L-AC-OUT)	Limatorque	SMB-0-05	QI
Valve Operator (L-AC-OUT)	Limatorque	SB-0-05	QI
Valve Operator (L-AC-OUT)	Limatorque	SMB-0-15-3600	QI
Valve Operator (L-AC-OUT)	Limatorque	SMB-3-110-3600	QI
Valve Operator (L-AC-OUT)	Limatorque	SB-0-40-3600	QI
Valve Operator (L-AC-OUT)	Limatorque	SMB-10-10-1800	QI

APPENDIX B (Continued)

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EQUIPMENT ITEM	MANUFACTURER	MODEL NO.	DEFICIENCY/ CORRECTIVE ACTION
Valve Operator (L-AC-OUT)	Limatorque	SMB-000	QI
Valve Operator (L-AC-OUT)	Limatorque	SMB-00-10	QI
Valve Operator (L-AC-OUT)	Limatorque	SMB-00-2-1800	QI

Foot Note: \*This component is not required for harsh environment program.  
 \*\*Applicant cannot locate this component inside containment.

APPENDIX C  
EQUIPMENT CONSIDERED ACCEPTABLE  
OR CONDITIONALLY ACCEPTABLE  
(Category 3:11.4.1.3)

DEFICIENCY/  
CORRECTIVE  
ACTION

EQUIPMENT ITEM	MANUFACTURER	MODEL NO.	DEFICIENCY/ CORRECTIVE ACTION
Electrical Penetration (E020A)	Amphenol	Low V 12 IPS EPA	A
Electrical Penetration (E020A)	Amphenol	Medium V 26 IPS EPA	A
600 Volt Power Cable (E022A)	Essex International	33373-06	A
600 Volt Power Cable (E022A)	Essex International	33373-02	A
600 Volt Power Cable (E022A)	Essex International	33373-52	A
600 Volt Power Cable (E022A)	Essex International	33373-59	A
600 Volt Power Cable (E022A)	Essex International	33372-02	A
600 Volt Power Cable (E022A)	Essex International	33372-06	A
600 Volt Power Cable (E022A)	Essex International	33371-54	A
Low Voltage Power Cable (Rework) (E022B)	Essex International	Rework	A
Flow Transmitter (J245B)	Rosemount	1152DP5	A
Pressure Transmitter (J245B)	Rosemount	1152GP5-12PB	A
Flow Transmitter (J245B)	Rosemount	1152DP4	A
Pressure Transmitter (J245B)	Rosemount	1152GP5	A
Flow Transmitter (J245C)	Rosemount	1153DB5	A
Flow Transmitter (J245C)	Rosemount	1153DB4	A
Cable Assembly (J249A)	Endevco/Tec	2273-02	A
Flow Sensor (J249A)	Endevco/Tec	2273 AM1	A
Flow Transmitter (J249A)	Endevco/Tec	504A	A
Pump Motor (M028A)	Siemens-Allis, Inc.	PG-404T-6	A
Pump Motor (M054A)	Allis Chalmers	Type RG, Frame 445TS	A
Valve Operator (M1230C)	Rotork Inc.	70 MAI Synchroset	A
Electric H <sub>2</sub> Recombiner (M163A)	Westinghouse	Type A	A
Flow Transmitter (M1.35A)	Balfey Controls	NRQ 55221	A
Pressure Transmitter (M1.35B)	Balfey Controls	NKS 55221	A

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EQUIPMENT ITEM	MANUFACTURER	MODEL NO.	DEFICIENCY/ CORRECTIVE ACTION
Electric Penetration Modification (E120A)	Conax	7769-10000-03	A
Electric Penetration Modification (E120A)	Conax	7769-10000-04	A
Electric Penetration Modification (E120A)	Conax	7769-10000-05	A
Electric Penetration Modification (E120A)	Conax	7769-10000-06	A
Electric Penetration Modification (E120A)	Conax	7769-10000-07	A
Electric Penetration Modification (120A)	Conax	7769-10000-08	A
Electric Penetration Modification (E120A)	Conax	7769-10000-09	A
Electric Penetration Modification (E120A)	Conax	7769-10000-10	A
Electric Penetration Modification (E120A)	Conax	7769-10000-11	A
Electric Penetration Modification (E120A)	Conax	7769-10000-12	A
Electric Penetration Modification (E120A)	Conax	7769-10000-13	A
Electric Penetration Modification (E120A)	Conax	7769-10000-01	A
Electric Penetration Modification (E120A)	Conax	7769-10000-02	A
600V Wire 1/C #8 (F001)	Anaconda-Ericsson	8 133 NSIS-X500 Gray	A
600V Wire 1/C #6 (F001)	Anaconda-Ericsson	6 133 NSIS-X500 Gray	A



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APPENDIX D

SAFETY-RELATED SYSTEMS WITH COMPONENTS WHICH PERFORM SAFETY FUNCTIONS

Function	System (Startup System)
1. Emergency Reactor Shutdown	Reactor Coolant and Pressure Control (EB) Decay Heat Removal (BC) Makeup, Purification, and Reactor Coolant Addition (BG) Borated Water Storage (BN) Unit Logic Cabinet C34 and Associated Window Arrays (BK) Engineered Safeguards Actuation (SA) Reactor Protection (SB) Neutron Monitoring (SE) Reactor Control (SF) Safety Parameter Display Panel (SO)
2. Containment Isolation	Main Steam (AB) Feedwater (AE) Decay Heat Removal (BC) Makeup Purification, and Reactor Coolant Addition (BG) Primary Water (BL) Steam Generator Recirculation (BM) Reactor Building Penetration Pressurization (BT) Fuel Pool Cooling and Purification (EC) Component Cooling Water (EG) Reactor Building Combustible Gas Control (GS) Reactor Building Air Purification, Cleanup, and Ventilation (GT) Radwaste Gas (HA) Boron Recovery (HE) Engineered Safeguards Actuation (SA) Plant Radiation Monitoring (SD)



Function	System (Startup System)
3. Reactor Core Cooling	Main Steam (AB) Auxiliary Feedwater (AL) Condensate Storage and Transfer (AP) Reactor Coolant and Pressure Control (EB) Decay Heat Removal (BC) Makeup, Purification, and Reactor Coolant Addition (BG) Core Flooding (BH) Borated Water Storage (BN) Component Cooling Water (EG) Auxiliary Feedwater Pump Turbines (FC) Engineered Safeguards Actuation (SA) Reactor Protection (SB) Safety Parameter Display Panel (SO)
4. Containment Heat Removal	Decay Heat Removal (BC) Reactor Building Spray (BK) Borated Water Storage (BN) Service Water (EA) Component Cooling Water (EG) Reactor Building Heat Removal (GN) Engineered Safeguards Actuation (SA)
5. Core Residual Heat Removal	Deminerlized Water Storage and Transfer (AN) Decay Heat Removal (BC) Makeup, Purification, and Reactor Coolant Addition (BG) Service Water (EA) Component Cooling Water (EG) Safety Parameter Display Panel (SO)

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Function	System (Startup System)
6. Prevent Radioactivity Release	Reactor Coolant and Pressure Control (BB) Decay Heat Removal (BC) Reactor Building Spray (BK) Borated Water Storage (BN) Reactor Building Penetration Pressurization (BT) Fuel Pool Cooling and Purification (EC) Auxiliary Building HVAC Including Emergency Spent Fuel Pool Exhaust (GL) Radwaste Gas (HA) Unit Logic Cabinet C34 and Associated Window Arrays (RK) Engineered Safeguards Actuation (SA) Plant Radiation Monitoring (SD) Radioactive Liquid Sampling and Analysis (SJ) Safety Parameter Display Panel (SO)
7. Support Systems	Service Water Traveling Screens and Screen Wash (DC) Service Water (EA) Component Cooling Water (EG) Central Chilled Water (GB) Service Water Pump Structure HVAC (GD) Safeguards Equipment Chilled Water (GJ) Auxiliary Building HVAC Including Control Room (GL) Diesel Generator Building HVAC (JM) Standby Diesel Fuel Storage (JE) Fuel Handling and Storage (KE) Station Power Transformers and Auxiliaries (NA) Lower Medium Voltage (4.16KV non-Class 1E Power) (NB) Miscellaneous Cable and Electrical Penetrations (NA) Lower Medium Voltage (4.16KV Class 1E Power) (FB) Standby Generation (Diesel Generators) (FE) Low Voltage Unit Substation (480V Class 1E Power) (PG) Low Voltage MCC (480V Class 1E Power) (PK) 125 Vdc Control Power (PK)

Function	System (Startup System)
7. Support Systems (cont.)	120Vac Preferred Power Panels (PN) 120Vac Control and Instrument Power Panels (PP) Distribution Panels (480Vac) Unit (PR) Process Instrumentation (RL) Neutron Monitoring (SE) Reactor Control (SF) Miscellaneous Consoles and Systems (SO) Miscellaneous Mechanical Equipment (ZZ) Miscellaneous Electrical Equipment (NA) Miscellaneous Structural Items (NA)