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April 25, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: Catawba Nuclear Station
Docket Nos. 50-413 and 50-414

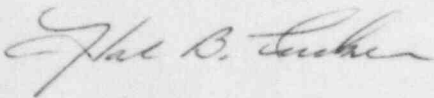
Dear Mr. Denton:

Attached are five (5) copies of Revision 3 to Duke Power Company's response to NUREG-0588 for the Catawba Nuclear Station. This revision provides a general update to the equipment tables as well as specific information requested by the NRC Staff in a February 8, 1984 meeting and in the March 6-8, 1984 environmental qualification audit at Catawba.

Additionally, in accordance with 10 CFR 50.49(i), Duke Power Company is providing analyses covering three equipment types for which environmental qualification is not yet complete. These analyses demonstrate that Catawba Unit 1 can be safely operated pending completion of the qualification activities.

This submittal therefore completes Duke Power Company's response to the environmental qualification portion of Catawba Safety Evaluation Report, Open Item 4.

Very truly yours,



Hal B. Tucker

ROS/php

Attachments

cc: (w/attachment)
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Mr. Harold R. Denton, Director
April 25, 1984
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cc: (w/o attachment)

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CATAWBA NUCLEAR STATION
ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT
RESPONSE TO NUREG 0588

Revision 3 Insertion Instructions

This revision replaces the introductory material and Attachments 1,2,3,and 4 in their entirety. Attachment 5 is not affected by this revision.

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

In accordance with 10CFR50.49 and the Category II guidelines of NUREG 0588, Duke Power Company is providing the information in this submittal to demonstrate that electrical equipment required to perform a safety-related function in a harsh environment is environmentally qualified. In addition to equipment specific information, this submittal also contains a discussion on compliance with 10CFR50.49(b), responses to NRC questions on the Catawba environmental qualification program (Ref. NRC letter dated March 3, 1983), and additional information as requested in the NRC's March 6-8, 1984 audit of the Catawba environmental qualification program.

With regard to the format of this submittal, the information described above is arranged as follows:

- Introduction, Discussion of 10CFR50.49(b), Response to Previous NRC Questions, and Additional Information Requested During the NRC EQ Audit.
- Attachment 1 - Summary of Environmental Qualification of Class 1E Equipment Located Inside Containment
- Attachment 2 - Summary of Environmental Qualification of Class 1E Equipment Located in the Annulus
- Attachment 3 - Summary of Environmental Qualification of Class 1E Equipment Located Outside Containment and Exposed to HELB Environment
- Attachment 4 - Summary of Environmental Qualification of Class 1E Equipment Located Outside Containment and Exposed to the Post-LOCA Recirculation Radiation Environment
- Attachment 5 - Duke Power Company Position on the Category II Guidelines of NUREG 0588

Attachments 1, 2, 3, and 4 provide a tabular listing of Class 1E equipment exposed to harsh environment and include appropriate qualification data for the equipment. Attachment 5 provides the Duke Power Company position on the Category II Guidelines of NUREG 0588.

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT
COMPLIANCE WITH 10CFR50.49(b)

With regard to 10CFR50.49(b)(1), safety-related electrical equipment located in a harsh environment is identified in the Catawba Nuclear Station NUREG 0588 submittal.

With regard to 10CFR50.49(b)(2), Duke Power Company has not identified any non-safety-related electrical equipment located in a harsh environment whose failure under the postulated accident conditions could prevent satisfactory accomplishment of a safety function by safety-related equipment. This determination was based on a review of Duke's design practices for Catawba, the Catawba electrical and physical separation criteria, and previous reviews in this area with regard to IE Information Notice 79-22.

The Catawba safety-related electrical power and control systems are designed in accordance with IEEE 308-1971 and IEEE 279-1971, respectively, as discussed in the Catawba FSAR. These two standards, as implemented in the Catawba design, place strict requirements on the interfacing of safety-related and non-safety-related electrical equipment. Where non-safety-related loads receive power from safety-related buses, qualified isolation devices (e.g., safety-related breakers automatically tripped by an accident signal) are provided to preclude unacceptable influences of non-safety-related equipment on the safety-related power system. The Catawba separation criteria is discussed in FSAR Section 8.3.1.4 and has previously been reviewed and accepted by the Staff (Ref. Catawba SER).

With regard to control systems where non-safety-related equipment provides input to control safety-related equipment, accident actuation signals are provided to override the non-safety-related control inputs. In addition to the override feature, non-safety-related inputs to safety-related control systems are reviewed during the design process to assure that no failure modes of the non-safety-related inputs can preclude completion of the required safety actuation. The combination of the override feature and the review of non-safety-related control inputs assures that no unacceptable influences of non-safety-related equipment on safety-related equipment can occur to prevent the satisfactory accomplishment of a safety function.

In addition to the design features described above, Duke Power Company performed an analysis of control systems at Catawba in response to IE Information Notice 79-22. The purpose of the analysis was to determine what, if any, design changes or operator actions would be necessary to assure that environments caused by high energy line breaks (HELB) would not cause an electrical non-safety-related control system to fail in such a manner as to complicate the event beyond the assumptions of the accident analysis. The systems considered in this analysis were identified by Westinghouse for Catawba and reviewed by Duke for the interaction described above. The systems reviewed were the Steam Generator PORV Control System, the Pressurizer PORV Control System, the Main Feedwater Control System, and the Automatic Rod Control System. The results of this review revealed that no design changes or operator actions were required to address the issue. Duke Power Company has documented this analysis in response to NRC Staff Question 420.3. The NRC Staff has reviewed the information provided and found the Catawba analysis acceptable (Ref. Catawba SER).

With regard to 10CFR50.49(b)(3), the current licensing basis for Catawba post accident monitoring instrumentation available to the plant operator following a Condition II, III, or IV event is discussed in the Catawba FSAR, Section 7.5. The specific accident monitoring instrumentation functions are listed in FSAR Table 7.5.1-1. The instrumentation associated with these functions and located in a harsh environment is addressed in the Catawba NUREG 0588 submittal. The RCS wide-range pressure transmitters, the containment pressure transmitters, the main steamline pressure transmitters, the RWST level transmitters, and the containment hydrogen concentration analyzers are located in a mild environment.

It should also be noted that consistent with NUREG 0737, Supplement 1 and NRC Generic Letter 82-33, Duke Power Company has provided information to the NRC Staff regarding Regulatory guide 1.97, Revision 2. Additional qualification activities (if any) in this area will be pursued upon completion of the NRC Staff's review and subsequent issuance of any SER on this subject.

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT
RESPONSE TO NRC QUESTIONS

In response to an NRC Request for Additional Information dated March 3, 1983 (Elinor G. Adensam to H. B. Tucker) concerning the Catawba environmental qualification program, Duke Power Company is providing the following information.

1. Provide a list of safety-related systems containing components in a harsh environment.
 - a. Compare the systems in (1) above with those described in Table 3.2.2 of the FSAR. Justification should be provided for the exclusion of safety-related system(s) in Table 3.2.2 from the environmental qualification program (e.g., not required for accident mitigation, all components located in a mild environment, etc.). Indicate the Class 1E function(s) performed by each system.
 - b. Identify all safety-related components of each system by manufacturer model number and plant component I.D. number. For each component I.D. number specify its specific location in the plant (e.g., room number or room I.D. such as RHR Pump Room, etc.) and its function.
 - c. For each component, (inside and outside containment, in the annulus and those that are subjected to the post-LOCA recirculation environment) provide qualification information addressing temperature, pressure, humidity, radiation, chemical spray and submergence. If a particular parameter does not apply, make a statement to that effect.
 - d. Specify the frequency of replacement for components qualified for a period shorter than the design life of the plant. A surveillance and maintenance program that includes a replacement plan should be documented and implemented.

RESPONSE

Table 1 provides a list of safety-related systems containing equipment required to perform a safety function in a harsh environment. These systems are identified by the system designation (abbreviation), system title, and safety function.

It should be noted that for the purposes of this response, Table 1 is based not only on the systems identified in FSAR Table 3.2.2-2 (mechanical systems) but also on the electrical systems which support the mechanical systems. For design purposes, the plant electrical systems are assigned unique system designations and are therefore identified in Table 1 along with the mechanical systems provided the system has safety-related equipment required to function in a harsh environment.

It should also be noted that certain systems which are functionally not safety-related do perform an isolation function. These systems, therefore, contain a limited amount of safety-related equipment and are identified in Table 2 if the safety-related equipment is subject to a harsh environment.

- 1a. Table 3 reflects a comparison of the systems identified in FSAR Table 3.2.2-2 and Table 1 of this response. This comparison identifies those systems from FSAR Table 3.2.2-2 that are not included in the Catawba harsh environment qualification program. The justification for not including these systems in the harsh environment qualification program is also provided.
- 1b. The Catawba NUREG 0588 submittal identifies the safety-related electrical equipment located in a harsh environment by generic type, manufacturer, and model number. Where equipment functions can be identified within a generic equipment type and are meaningful from an environmental qualification standpoint, the functions are provided.

In terms of location, the Catawba NUREG 0588 submittal is divided into four sections which address the following safety-related equipment locations:

- 1) Containment
- 2) Annulus
- 3) Auxiliary Building - Pipe Rupture Environment
- 4) Auxiliary Building - Post LOCA Radiation Environment

For the equipment in the Catawba NUREG 0588 submittal, engineering reviews have determined that the accident environment and other criteria (e.g., required accuracy) identified are the worse case conditions applicable to the particular generic equipment type. The engineering reviews relied on approved and issued design documents to identify the various types of safety-related electrical equipment purchased and installed at Catawba. Once identified, the equipment locations are compared to the environmental zones defined for Catawba to determine the worse case environment. Therefore, once a worse case generic equipment type/application is identified and reviewed for proper environmental qualification, other identical equipment is enveloped and an equipment specific identification (i.e., tag number) review is not required. It should be noted that equipment specific details are available for audit in various Catawba Nuclear Station design documents.

- 1c. The environmental service conditions for the safety-related electrical equipment located in a harsh environment are identified in the Catawba NUREG 0588 submittal equipment tables. If a given environmental parameter does not apply, it is so noted in the equipment tables and associated notes.
- 1d. The replacement intervals for electrical equipment required to function in a harsh environment are identified in the Catawba NUREG 0588 equipment tables. The replacement intervals are only identified for that equipment having a service life shorter than the design life of the plant.

The Catawba surveillance and preventative maintenance program that includes qualification mandated equipment and component replacement requirements for safety related electrical equipment conforms to the guidance contained in AMS 3.2/ANSI-N18.7-1976, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants". The program is based on Technical Specification requirements, manufacturer's information,

qualification program results, and Duke operating experience and is developed by station personnel using approved and issued design documents. Implementation of this program is through station procedures. This program also facilitates ongoing reviews of equipment performance, and as such the surveillance and preventative maintenance procedures can be continually updated based on experience.

In addition to the station specific program described above, Duke has implemented an Operating Experience Evaluation Program that monitors safety significant issues including equipment performance. This program considers not only the operating experience from seven Duke nuclear units but also overall nuclear industry experience via information mechanisms such as NRC IE Bulletins and Information Notices and INPO SERs and SOERs.

2. Provide a list of TMI Action Plan equipment (by Categories listed in NUREG-0737) currently in your program and its equipment I.D. number. If not in your program, describe the qualification status or your plans for qualification, including the schedule for completion of qualification in accordance with NUREG-0588.

RESPONSE

Table 4 provides a list of TMI Action Plan electrical equipment required to perform a safety function in a harsh environment. This equipment is grouped according to NUREG 0737 category with information provided concerning qualification status.

3. The staff's screening criteria for radiation levels that result from an accident environment inside containment is 4×10^7 rads total integrated dose (TID). In your June 17, 1982, submittal a value of 1×10^7 TID was used. Because this value is less than the screening criteria, a sample calculation that includes the basis and all assumptions used in determining both gamma and beta radiation levels must be provided.

RESPONSE

A sample radiation calculation including the bases and assumptions used in determining the radiation levels at Catawba is provided at the end of Attachment 5.

4. The maximum temperature postulated to exist following a HELB inside containment may be higher than the value (327°F) specified in your June 17, 1982, submittal. This issue must be resolved with the NRC's Containment Systems Branch prior to acceptance by the Equipment Qualification Branch.

RESPONSE

This matter is currently under review by Duke Power Company and Westinghouse. The response to this particular item will be forwarded under separate cover following the completion of the Duke and Westinghouse review.

5. Provide a statement that 1E equipment located in areas which experience a significant percent increase in radiation during a LOCA has been reviewed for possible damage to solid states devices and describe the methods of qualification or bases for exemption.

RESPONSE

Class 1E equipment that is required to perform a safety function in a radiation environment equal to or greater than 1×10^3 rads TID has been reviewed for proper radiation qualification. The 1×10^3 rads TID includes the 40 year normal dose plus appropriate accident radiation dose applicable to the equipment location.

The qualification method for Class 1E equipment exposed to a harsh radiation environment ($> 1 \times 10^3$ rads TID) is identified in the Catawba NUREG 0588 submittal equipment tables.

6. The June 17, 1982, submittal did not always include the appropriate margin (1 hour or 10%) in the qualification data. Qualification data that are acceptable to the staff must include the appropriate margins in accordance with the requirements of NUREG-0588. Use of less than one hour must be justified.

RESPONSE

We have reviewed the Catawba NUREG 0588 submittal (as revised) and have identified two equipment item which provides a short term function and for which a one hour margin on operability demonstrated is not provided. The equipment items are the pressurizer pressure transmitters (Barton 763, Lot 2) and the Solon dP switch (Model 7PS11DW).

The pressurizer pressure transmitters (Barton 763, Lot 2) provide input to the Reactor Protection System and the Engineered Safety Features Actuation System. For design basis accidents that take credit for the pressurizer pressure reactor trip and safety injection actuation and that result in a harsh environment at the transmitter location, the transmitters perform their safety function in less than 5 minutes. The qualification test for these transmitters demonstrate that the trip accuracy requirement (+10%) is maintained for five minutes and probably much longer although that was not the objective of the qualification program. The qualification program did, however, verify that the transmitters will continue to operate for at least four months post-accident within a relaxed accuracy requirement which provides additional margin for the five minute trip requirement. It should also be noted that once the protection signal is generated by these transmitters, the signal is locked-in by the protection system and will not reset regardless of the subsequent performance of the transmitters.

The Solon dP switches are a part of the containment air return system and are located inside the containment. These switches provide a permissive signal to open the containment air return fan isolation dampers when the pressure differential between the upper and lower containment compartments drops to $\frac{1}{2}$ psi following an accident. FSAR Figure 6.2.1-11 shows that this pressure differential occurs at approximately 20 seconds into the accident. Once they have performed their function, the switches are electrically isolated from the Class 1E circuit and

have no further function. Based on a conservative estimate of operating time at one minute, a qualified operating time of five minutes, and the fact that following completion of the switches safety function they are electrically isolated from the Class 1E circuit, it is concluded that the five minute qualified operating time is adequate.

With regard to equipment items which provide long term functions, the operability required time includes at least a 10% margin thereby conforming to the margin requirement of NUREG 0588.

7. Provide information to demonstrate that a flooding and aging analysis is included in your qualification program.

RESPONSE

Flooding (submergence) and aging analyses are included in the Catawba environmental qualification program.

With regard to flooding, analyses are performed to identify both the inside containment and the outside containment flood levels. Based on these analyses, the safety-related electrical equipment located below the postulated flood levels is reviewed to determine the effects of submergence. Specifically, the equipment is reviewed to determine if it is required to mitigate the event causing the flood (e.g., pipe rupture), or to bring the plant to a safe shutdown. If the equipment is required to function, then submergence qualification is established or the equipment is relocated above the flood level. Safety-related equipment located below a postulated flood level and required to function as noted above is identified in the Catawba NUREG 0588 submittal.

With regard to aging, the inservice degradation of safety-related electrical equipment located in a harsh environment is addressed through preventive maintenance and surveillance programs with equipment and component refurbishment and/or replacement based on known susceptibility to aging degradation. These programs are based on qualification test results, manufacturer's recommendations, operating experience, and/or sound engineering practices. Replacement intervals for safety-related electrical equipment located in a harsh environment are identified in the Catawba NUREG 0588 submittal.

8. A discussion on the effects of beta radiation on components should be included in your qualification program.

RESPONSE

The safety-related electrical equipment including cables that are located inside the containment and required to perform a safety function in the harsh containment environment have been reviewed for the effects of beta radiation. Based on our review, we have determined that there is no safety-related electrical equipment located inside the containment that is susceptible to beta radiation degradation.

9. The submittal should address the environmental qualification of safety-related mechanical equipment located in a harsh environment.

RESPONSE

The environmental qualification of safety-related mechanical equipment located in a harsh environment will be addressed in a separate submittal.

TABLE 1

Safety-Related Systems Containing Equipment
Required to Function in a Harsh Environment

<u>SYSTEM ABBREVIATION</u>	<u>SYSTEM TITLE</u>	<u>SYSTEM SAFETY FUNCTION</u>
CA	Auxiliary Feedwater	Core Cooling
CF	Main Feedwater (Inst. Only)	Core Cooling
FW	Refueling Water	Core Cooling
KC	Component Cooling	Equipment Cooling
MI	Hydrogen Analyzer	Hydrogen Detection
NC	Reactor Coolant	Core Cooling
ND	Residual Heat Removal	Core Cooling
NF	Ice Condenser Refrigeration	Containment Heat Removal
NI	Safety Injection	Core Cooling
NS	Containment Spray	Containment Heat Removal
NV	Chemical and Volume Control	Core Cooling
RN	Nuclear Service Water	Supporting System
SA	Main Steam to Auxiliary Equipment	Core Cooling
VA	Auxiliary Building Ventilation	Post-Accident Clean-Up
VC	Control Area Air Conditioner	Supporting System
VD	Diesel Building Ventilation	Heat Removal
VE	Annulus Ventilation	Prevent Radioactive Release
YC	Control Area Chilled Water	Heat Removal
VX	Containment Air Return and Hydrogen Skimmer	Containment Heat Removal
EMF	Radiation Monitoring	Radiation Detection
EPC	4160VAC Essential Auxiliary Power	Supporting System
EPE	600VAC Essential Auxiliary Power	Supporting System
EPG	240/120VAC Vital I and C Power	Supporting System
EPY	120/240VAC Essential Auxiliary Power	Supporting System
EZA	Electrical Penetrations	Supporting System

TABLE 2

Non Safety-Related Systems Containing Safety-Related
Equipment Required to Function in a Harsh Environment to
Provide Isolation

SYSTEM
ABBREVIATION

SYSTEM
TITLE

BB	Steam Generator Blowdown
CF	Main Feedwater
NM	Nuclear Sampling
RF	Interior Fire Protection
SM	Main Steam
SV	Main Steam Vent to Atmosphere
VB	Breathing Air
VI	Instrument Air
VP	Containment Purge
VQ	Containment Air Release and Addition
VY	Containment Hydrogen Sample and Purge
YM	Make-up Demineralizer Water

TABLE 3

Comparison of Table 1 Systems to FSAR Table 3.2.2-2

<u>SYSTEM ABBREVIATION</u>	<u>SYSTEM TITLE</u>	<u>REASON FOR EXCLUSION FROM TABLE 1</u>
AD	Standby Shutdown Diesel	Non-Safety
AS	Auxiliary Steam	Non-Safety
BW	Steam Generator Wet Layup Recirculation	Manual Valves (Locked Closed)
CM	Condensate	Mild Environment
CS	Condensate Storage	Mild Environment
FD	Diesel Generator Engine Fuel Oil	Mild Environment
GH	Hydrogen	Non-Safety
GN	Nitrogen	Non-Safety
GS	Hydrogen Bulk Storage	Non-Safety
KD	Diesel Generator Cooling Water	Mild Environment
KF	Spent Fuel Cooling	Mild Environment
KR	Recirculated Cooling Water	Non-Safety
LD	Diesel Generator Lube Oil	Mild Environment
NB	Boron Recycle	No active mitigating function
NR	Boron Thermal Regeneration	No active mitigating function
RC	Condenser Circulating Water	Non-Safety
RL	Conventional Low Pressure Service Water	Non-Safety
RY	Exterior Fire Protection	Non-Safety

TABLE 3 (Cont'd)

Comparison of Table 1 Systems to FSAR Table 3.2.2-2

<u>SYSTEM ABBREVIATION</u>	<u>SYSTEM TITLE</u>	<u>REASON FOR EXCLUSION FROM TABLE 1</u>
SB	Main Steam Bypass to Condensate	Non-Safety
VG	Diesel Generator Engine Starting Air	Mild Environment
VJ	Computer Area Air Conditioner	Non-Safety
VN	Diesel Generator Engine Air and Exhaust	Mild Environment
VV	Containment Ventilation	Non-Safety
VZ	Nuclear Service Water Pump Structure Ventilation	Mild Environment
WC	Conventional Waste Water Treatment	Non-Safety
WE	Equipment Decontamination	Manual Valves
TE	Feedwater Pump Turbine Exhaust	No accident mitigating
WG	Gaseous Waste Disposal	No active mitigating function
WL	Liquid Radwaste	No active mitigating function
WN	Diesel Generator Room Sump Pump	Mild Environment
WP	Turbine Building Sump Pump	Non-Safety
WS	Solid Radwaste	No active mitigating function
WZ	Groundwater Drainage	Mild Environment

TABLE 3 (Cont'd)

Comparison of Table 1 Systems to FSAR Table 3.2.2-2

<u>SYSTEM ABBREVIATION</u>	<u>SYSTEM TITLE</u>	<u>REASON FOR EXCLUSION FROM TABLE 1</u>
YA	Conventional Chemical Addition	Non-Safety
YD	Drinking Water System	Non-Safety
YJ	Computer Area Chilled Water	Non-Safety
ZD	Diesel Generator Engine Crankcase Vacuum	Mild Environment

TABLE 4

NUREG 0737 Safety-Related Equipment Located
in a Harsh Environment

<u>0737 SECTION/ DESCRIPTION</u>	<u>EQUIPMENT</u>	<u>QUALIFICATION STATUS</u>
II.B.1 Reactor Coolant System Vents	Limitorque Motor Operated Valve SMB	See Attachment 1 Page 15
II.B.3 Post-Accident Sampling	Valcor Solenoid Valves V70900-21-3	See Attachment 1 Page 18a
II.D.3 Relief and Safety Valve Position Indication	TEC Valve Flow Monitor System	See Attachment 1 Page 10
II.E.1.2 Auxiliary Feedwater System Automatic Initiation and Flow Indication	Flow Transmitter Barton 764	See Attachment 3 Page 6
II.F.1 Additional Accident Monitoring Instrumentation	Pressure Transmitter Rosemount 1153	See Attachment 4 Page 4
	High Radiation Detectors General Atomic RD-23	See Attachment 1 Page 11
II.F.2 Instrumentation for Detection of Inadequate Core Cooling	RTD-MINCO S8809, S8810	See Attachment 1 Page 5a
	Mineral Insulated Thermocouple Cables and Connectors	See Attachment 1 Page 38

CATAWBA NUCLEAR STATION - UNITS 1 AND 2

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT RESPONSE TO NRC EQ AUDIT ITEMS

Based on the NRC's March 6 - 8, 1984 audit of the Catawba environmental qualification program, Duke Power Company is providing the following information. This information addresses the generic items identified by the NRC followed by the equipment specific items.

Generic Items

1. IE Information Notices Concerning Environmental Qualification

As a part of the Catawba EQ audit, the NRC questioned the status of Duke review/corrective action for IE Information Notices 81-06, 81-08, 81-20, 81-29, 82-52, and 83-72.

Duke Power Company has reviewed the Information Notices referenced above for applicability to Catawba and has taken corrective action as necessary to assure proper qualification. Details regarding the review and corrective action resulting from these Information Notices are available for audit at Duke.

2. Barton Transmitters (Models 763 and 764)

As a part of the Catawba EQ audit, the NRC requested a discussion of the resolution to the generic problems identified for Barton transmitters Model 763 and 764. Two generic problems have been identified, thermal non-repeatability and long term stability for Barton Model 763 zero based range pressure transmitters, and their resolutions for Catawba are discussed in the following paragraphs.

Thermal Non-Repeatability

NSSS Supplied Transmitters: Duke Power Company and Westinghouse have reviewed the extent of the inaccuracies identified in the thermal non-repeatability problem as applicable to the Catawba reactor protection and safeguards actuation setpoints, and the available margin in the safeguards analysis. This review determined that neither setpoint changes nor transmitter modifications are required for Catawba and that adequate margins exist to absorb the additional errors resulting from thermal non-repeatability.

Duke Supplied (BOP) Transmitters: The BOP Barton transmitters were reviewed by Duke Power Company for applicability of the thermal non-repeatability problem. It has been determined that the BOP Barton transmitters purchased by Duke were purchased after the thermal non-repeatability problem was identified, and modifications were made prior to shipment to Catawba.

Long Term Stability for Barton Model 763 Zero
Based Range Pressure Transmitters

NSSS Supplied Transmitters: Duke Power Company and Westinghouse are presently evaluating applicability of this problem to the Catawba design. Duke Power Company will provide a followup response prior to fuel load concerning this problem. It should be noted that the problem was identified for transmitters with a normal operating indication of 80% or greater of full scale indication. The affected transmitters at Catawba operate with a normal operating indication of only 70% of full scale. Therefore, Duke Power does not anticipate this problem to be applicable to Catawba.

Duke Supplied (BOP) Transmitters: No Barton Model 763 zero based range pressure transmitters have been purchased for BOP application.

3. Specified/Qualified Values on SCEW Sheets

During the audit of specific qualification documentation, the NRC identified certain inconsistencies between specified/qualified values noted on the SCEW sheets and the values found in the qualification documentation. The NRC requested that Duke review the Catawba NUREG 0588 submittal for these type inconsistencies and make the necessary SCEW short changes. Duke Power Company has reviewed and corrected as necessary each SCEW sheet to accurately reflect the specific qualification documentation data. Additionally, a special emphasis has been placed on correcting typographical errors in the Catawba NUREG 0588 submittal.

Equipment Specific Items

1. RdF RTDs (Model 21205)

The Catawba reactor coolant system wide range temperature detectors are located inside the containment below the maximum post accident water level. The NRC requested additional information concerning the capability of these RTDs to function while submerged.

These RTDs are hermetically sealed units with Flexonics Type 401 H stainless steel hydrostatic hose covering the RTD leads. The hydrostatic hose is rated from 70°F to 1500°F at corresponding pressures from 2660 psig (at 70°F) to 1064 psig (at 1500°F). These pressure ratings are in accordance with USA Standard Code for Pressure Piping and with the ASME Boiler and Pressure Vessel Code, Section VIII. To assure leak tightness of each RTD hydrostatic hose covering the RTD leads, helium leak rate testing is performed by the manufacturer on each RTD. The acceptance criteria for the helium leak rate test is less than 1×10^{-7} Std. cm³/s. ASTM Standard E427-71, Testing for Leaks Using the Halogen Leak Detection states that "experience has shown that, at the same pressures, gas leaks smaller than 1×10^{-5} Std. cm³/s will not show visible leakage of a liquid such as water . . ."

Based on the temperature and pressure capability of the hydrostatic hose, its stainless steel construction, the conservative helium leak rate test applied to each RTD, and the qualification program results documented in

WCAP 8687, Supplement 2, E06A, the RdF RTDs are qualified for their application at Catawba. Additionally, the RTD leads terminate to the field cable above the maximum post accident flood level thereby precluding a submergence problem with the RTD termination. Documentation necessary to support the submergence capability of the RTDs is on file and available for audit at Duke Power Company.

3. Barton Transmitters (Models 763 and 764)

During the review of the Barton transmitter qualification report (WCAP 9885) the NRC requested additional information concerning the temperature profile of the qualification test. Specifically, the FSAR peak postulated accident temperature has a time duration of approximately 10 minutes versus the qualification test peak temperature duration of approximately 5 minutes.

Westinghouse has performed a thermal analysis of the transmitter which demonstrates that for a temperature/duration in excess of the Catawba accident environment, the internal transmitter temperature does not exceed the temperature experienced during the qualification test. This analysis coupled with the transmitter qualification program provides adequate assurance of qualification. Documentation necessary to support this thermal analysis is on file and available for audit at Duke Power Company.

4. Valcor Solenoid Valves (Model 70900-21-1, -3)

During the audit discussion of these Valcor solenoid valves, Duke Power Company informed the NRC that additional comprehensive testing sponsored by Duke and Valcor was in the final stages of completion that would supercede the existing qualification results. The results of this recent testing which support the qualification of these valves for their applications at Catawba are documented in Valcor Report QR70900-21-1 and -3. This report is on file and available for audit at Duke Power Company. Additionally, the Catawba NUREG 0588 submittal SCEW sheet for this equipment has been revised to reflect this new qualification information.

5. ITT Damper Operators (Model NH-90 Series)

During the review of the ITT damper operator qualification report (ITT Report No. 721.77.095), an anomaly was noted regarding failure of the operator to function following radiation exposure (3.96×10^7 Rads TID). The failure of the operator to function was determined to be caused by a high pressure condition in the operator resulting from off-gassing of the hydraulic fluid when subjected to radiation. The qualification report also identified a resolution to this problem which involved venting the fluid reservoir by drilling a hole in the upper fluid fill plug of the operator. During the field walkdown at Catawba, an operator was inspected to assure that the modification (upper fill plug vent hole drilled) had been made. The damper operator inspected (as well as all affected operators) had not been modified. The NRC asked Duke to review this matter and to provide additional information concerning this anomaly.

Duke Power Company has reviewed this matter with ITT and with the hydraulic fluid supplier. It has been determined that the test radiation exposure rate which significantly exceeds the Catawba rate caused the fluid heating and off-gassing problem. This determination is based on testing conducted by ITT as reported in ITT Report No. 730.140. As a result of this additional information it has been determined that venting the hydraulic fluid resevoir as noted in ITT Report No. 721.77.095 is not required at Catawba. The documentation necessary to support this determination is on file and available for audit at Duke Power Company. Additionally the Catawba NUREG 0588 submitted SCEW sheet for this equipment has been revised to reflect this new qualification information.

CATAWBA NUCLEAR STATION
ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT
ANALYSIS OF EQUIPMENT APPLICATION PENDING COMPLETION OF QUALIFICATION

D. G. O'Brien Electrical Penetration - Type H Module

D. G. O'Brien electrical penetration Type H modules are used in conjunction with the containment high range radiation monitoring system. This system functions at high voltages and extremely low current levels thus posing unique application and qualification requirements specifically with regard to leakage currents.

Based on similarity of the Type H modules to the Type K modules, the Type H has been determined to be operable during the initial accident transient. Long term operability in terms of maintaining the radiation monitoring system accuracy is being evaluated. However, because of the capability to obtain equivalent information on long term containment radiation levels through qualified sample systems or other radiation monitor readings correlated to the containment, the long term operability of the Type H module is not considered essential to plant accident recovery. It should also be noted that the containment high range radiation monitoring instrumentation used in conjunction with the Type H module does not serve as a basis for long-term operator action.

The resolution of this issue is scheduled for March, 1985.

Valcor Solenoid Valve Operators - Models 70900-21-1 and 3

These Valcor solenoid valves have two basic applications at Catawba - system isolation (de-energize upon receipt of a safety signal) and containment hydrogen sampling (periodically energize to open sample lines). Recent qualification program results (Valcor Report QR 70900-21-1 and 3) demonstrate proper qualification for the system isolation function; however, qualification for longer than 2 days post DBE for the containment hydrogen sampling application has not been demonstrated by the Valcor program. Therefore, this JCO addresses only the hydrogen sampling application for these solenoid valve operators.

As originally designed, the sample valves for the containment hydrogen sampling system were to be normally closed when its associated solenoid was de-energized. This design required the system operator to open the sample valves (i.e., energize the solenoids) to take a containment air sample. However, because of the qualification program results regarding long term operability demonstrated (2 days post DBE) versus the system operability requirement (10 days post DBE), a system design change is currently being implemented. This design change now makes the sample valves normally open when the solenoid is de-energized, thereby assuring that a containment air sample would be available for at least 10 days post DBE. It should be noted that the containment isolation function for the hydrogen sample system is performed by other qualified valves.

Duke Power Company is reviewing the Valcor qualification program results to determine the action required to extend the post DBE operability of these solenoid operators. Resolution of this issue is scheduled for March, 1985 and may involve solenoid valve modifications or permanent system design changes.

Area Termination Cabinet - 1EATC12

This area termination cabinet is located outside the containment and is exposed to a post-LOCA radiation environment only (1.2×10^4 Rads TID-40 year normal dose plus one year accident dose). The components installed inside this cabinet are currently being reviewed for radiation qualification. This review and any required corrective action is scheduled for completion prior to initial criticality (Mode 2). However, since no fission product inventory would be present in the reactor coolant system to cause a radiation environment prior to initial criticality, plant safety is not affected.

ATTACHMENT 1

SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

<u>Page</u>	<u>Rev.</u>	<u>Page</u>	<u>Rev.</u>	<u>Page</u>	<u>Rev.</u>
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5a	3				
6	3				
7	3				
8	3				
9	D				
10	1				
11	3				
12	3				
13	1				
14	3				
15	3				
16	3				
17	2				
18	3				
18a	3				
18b	3				
19	2				
20	1				
21	2				
22	2				
23	3				
24	3				
24a	D				
25	3				
26	3				
27	1				
28	1				
29	3				
30	3				
31	3				
32	1				
33	1				
34	1				
35	0				
36	3				
37	D				
38	3				
CN-1	3				
CN-2	3				

*D - Deleted

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 1
Rev. 3

EQUIPMENT ID: (1) Transmitter -
Pressurizer Pressure
(Lower Containment)

MANUFACTURER: Barton
(NSSS)

MODEL #: 763
(Lot 2)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 5.0E6R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 380°F Press: 90 psig RH: 100% Rad: 5X10 ⁷ R Chem Spray: Boric acid and sodium hydroxide soln. 2750 ppm Boron 8.5 pH	SI Initiation (<5 minutes)	>5 minutes post DBE	+ 10%	Max. error 7.7% (5 minutes)

SUBMERGENCE: Yes (Note 3)

QUALIFICATION REPORT: WCAP 9885 (CNM-1399.03-318)

METHOD: Test

REPLACEMENT INTERVAL: 10 years

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1 EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 2
Rev. 3

EQUIPMENT ID: (1) Transmitter -
Pressurizer Level
(Lower Containment) MANUFACTURER: Barton
(NSSS) MODEL #: 764
(Lot 2)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 2×10^7 Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 380°F Press: 90 psig RH: 100% Rad: 5×10^7 R Chem Spray: Boric acid and sodium hydroxide soln. 2750 ppm Boron 8.5 pH	2 weeks post-DBE	4 months post DBE	± 25%	Max. error 15%

SUBMERGENCE: No

QUALIFICATION REPORT: WCAP 9885 (CNM-1399.03-318)

METHOD: Test

REPLACEMENT INTERVAL: 10 years

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 4
Rev. 3

EQUIPMENT ID: RTD -
(1) RCS Temperature (NR)
(Lower Containment)

MANUFACTURER: RdF Corp.
(NSSS)

MODEL #: 21204

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.4×10^7 Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 420°F Press: 72 psig RH: 100% Rad: 4.16×10^7 R for Tip 1.22×10^8 R for Cable Chem Spray: Boric acid and sodium hydroxide soln. 2750 ppm Boron 0.9% NaOH 10.7 pH	Reactor Trip (<5 minutes)	16 days post SLB	$\pm 0.2^\circ\text{F}$	$\pm 0.0^\circ\text{F}$

SUBMERGENCE: Yes (Note 3)

QUALIFICATION REPORT: WCAP 8687, Supp. 2, E05A (CNM-1399.03-327)
WCAP 8687, Supp. 2, E06A (CNM-1399.03-328)

METHOD: Test

REPLACEMENT INTERVAL: 20 years

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 5
Rev. 3

EQUIPMENT ID: RTD -
(1) RCS Temperature (WR)
(Lower Containment)

MANUFACTURER: RdF Corp.
(NSSS)

MODEL #: 21205

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 6.6X10 ⁷ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 420°F Press: 72 psig RH: 100% Rad: 2.47X10 ⁸ R for Tip 1.22X10 ⁸ R for Cable Chem Spray: Boric acid and sodium hydroxide soln. 2750 ppm Boron 0.9% NaOH 10.7 pH	2 weeks post DBE	4 months post DBE	± 0.2%	± 0.0%

SUBMERGENCE: Yes (Note 4)

QUALIFICATION REPORT: WCAP 8687, Sup. 2, E06A (CNM-1399.03-328)

METHOD: Test

REPLACEMENT INTERVAL: 10 years

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 5a
Rev. 3

EQUIPMENT ID: RTD - RVLIS Temp. Comp.
(1) (Lower Containment)

MANUFACTURER: MINCO
(NSSS)

MODEL #: S 8809
S 8810

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 9×10^7 R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 420°F Press: 75 psig RH: 100% Rad: 1.6×10^8 R 2750 PPM H_3BO_3 NaOH to 10.7 pH	4 months Post DBE	4 months Post DBE	$\pm 1.19\%$	$\pm .2\%$

SUBMERGENCE: Yes (Note 4)

QUALIFICATION REPORT: WCAP-8687, Supp. 2, E-42A (CNM-1399.03-357)

METHOD: Test

REPLACEMENT INTERVAL: 10 years

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 6
Rev. 3

EQUIPMENT ID: Differential Pressure Switch
(1) Supply Header Flow to Reactor
Coolant Pumps (Lower Containment)

MANUFACTURER: Barton

MODEL #: 581A-1

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3x10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 340°F Press: 72 psig RH: 100% Rad: 2x10 ⁸ R Chem Spray: 3000 ppm pH: 10.5	4 months post DBE	4 months post DBE	± 15%	± 12.3%

SUBMERGENCE: No

QUALIFICATION REPORT: Barton Report # 548-8890 Rev. A

METHOD: Test

REPLACEMENT INTERVAL: 18 years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 7
Rev. 3

EQUIPMENT ID: Differential Pressure
(1) Switch
(Upper Containment)

MANUFACTURER: Solon

MODEL #: 7PS11DW

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 180°F Press: 9.0 psig RH: 100% Rad: 1.26×10^4 R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 212°F Press: 15 psig RH: N/A Rad: 2.1×10^6 R Chem Spray: N/A	5 minutes	1 hour	.05 psid	.05 psid

SUBMERGENCE: No

QUALIFICATION REPORT: MCM-1211.00-1505 Test Report

METHOD: Test/Analysis

REPLACEMENT INTERVAL: 10 years

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 8
Rev. 3

EQUIPMENT ID: Limit Switches
(1) (Lower Containment)

MANUFACTURER: NAMCO

MODEL #: EA-180

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.1×10^8 R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 340°F Press: 70 psig RH: 100% Rad: 2×10^8 R Chem Spray: Boric acid and sodium hydroxide soln. 3000 ppm Boron 10.5 pH	5 minutes post DBE	30 days post DBE	N/A	N/A

SUBMERGENCE: Yes (Note 5)

QUALIFICATION REPORT: NAMCO Test Reports dated September 5, 1978 (CNM-1205.19-0041) and QTR-106 (CNM-1205.19-0042)

METHOD: Test

REPLACEMENT INTERVAL: 8.9 years

MEQP/MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 10
Rev. 1

EQUIPMENT ID: (1)	Safety Valve Position Indication Sensors, Charge Amps and Cables (Lower Containment)	MANUFACTURER: TEC	MODEL #:	2273A Accelerometer 504A Charge Converter 160-2 Transient Shield 2273-C2 Cable Assembly
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ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 8×10^7 R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 510°F Press: 85 psig RH: 100% Rad: 2×10^8 R Chem Spray: Boric acid and sodium hydrazine and sodium phosphate soln. 13,000 to 14,000 ppm 7-7.5 pH	2 weeks post DBE	1 month post DBE	N/A	N/A

SUBMERGENCE: No

QUALIFICATION REPORT: Tec Report 517-TR-03 Rev. 2 (CNM-1346.17-09 through 14)

METHOD: Test

REPLACEMENT INTERVAL: 4 years (Charge Converter Only)

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 11
Rev. 3

EQUIPMENT ID: High Radiation
(1) Detectors
(Lower Containment)

MANUFACTURER: General Atomic Co.

MODEL #: RD-23

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 240°F Press: 14.4 psig RH: 100% Rad: 1X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 315°F Press: 77 psig RH: 100% Rad: Note 6 Chem Spray: Boric acid and sodium thiosulfate and sodium hydroxide soln. 3000 ppm Boron 10.5 pH	2 weeks post LOCA	18 days post LOCA	(Note 7)	(Note 7)

SUBMERGENCE: No

QUALIFICATION REPORT: GA Report E-254-960 (CNM-1346.05-50)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 12
Rev. 3

EQUIPMENT ID: Coaxial Cable for High
(1) Radiation Detectors
(Lower Containment)

MANUFACTURER: Rockbestos

MODEL #: RSS-6-104-1081

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 240°F Press: 14.4 psig RH: 100% Rad: 1x10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 315°F Press: 77 psig RH: 100% Rad: 2.0x10 ⁸ R Chem Spray: Boric acid and sodium thiosulfate and sodium hydroxide soln. 3000 ppm Boron 10.5 pH	2 weeks post LOCA	1 year post LOCA	N/A	N/A

SUBMERGENCE: No

QUALIFICATION REPORT: Rockbestos Report 2806 (Appendix 5 of G.A. Report E-254-960, CNM-1346.05-50)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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Rev. 1

EQUIPMENT ID: Excore Neutron
(1) Detector (Power Range)
(Lower Containment)

MANUFACTURER: Westinghouse
(NSSS)

MODEL #: WL-23686

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
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The Power Range Neutron Detectors are not required for accidents that cause a change in the normal containment operating environment. Further, failure of these detectors as a result of exposure to a harsh environment will not preclude the safety function of other equipment claimed in the accident analysis. Additionally, the information provided by these detectors is not employed as a post accident monitoring parameter for operator action. The flux monitoring instrumentation required per Regulatory Guide 1.97 will be provided by other equipment to be added at a later date.

SUBMERGENCE: N/A

QUALIFICATION REPORT: N/A

METHOD: N/A

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 14
Rev. 3

EQUIPMENT ID: Valve Motor Operators
(1) (Lower Containment)

MANUFACTURER: Rotork

MODEL #: NA-1

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 340°F Press: 70 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, sodium thiosulfate, and sodium hydroxide soln. 3000 ppm Boron 10.5 pH	30 days post DBE	30 days post DBE	Note 8	Note 8

SUBMERGENCE: Yes (Note 5)

QUALIFICATION REPORT: N11/4, (December 1970); N14/2 (May 1970); TR116 (November 1973); TR222 (May 1972); 43979-1 (December 1978); TR178 (December 1974) (CNM-1205.19-6, -7, -8, -11, -15, -19)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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Rev. 3

EQUIPMENT ID: Valve Motor Operators (1) MANUFACTURER: Limitorque MODEL #: SMB RH Motor Insulation
(Lower Containment)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 340°F Press: 105 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, and sodium hydroxide soln. 3000 ppm Boron pH: 10.5	30 days post DBE	30 days post DBE	Note 8	Note 8

SUBMERGENCE: Yes (Note 5)

QUALIFICATION REPORT: Limitorque Report 600-376-A, September 1972; 600-456, December 1975 (CNM-1205.19-0001)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 16
Rev. 3

EQUIPMENT ID: (1) Containment Air Return Fan
Isolation Damper Motor Operators
(Upper Containment) MANUFACTURER: Rotork MODEL #: 11NAZI

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 180°F Press: 14.4 psig RH: 100% Rad: 1.1X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 385°F Press: 75 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, and sodium hydroxide soln. 6200 ppm Boron 9.5 pH	5 minutes post DBE	30 days post DBE	Note 8	Note 8

SUBMERGENCE: No

QUALIFICATION REPORT: Wyle Report 43979-1 (CNM-1211.00-1076)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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Rev. 2

EQUIPMENT ID: Valve Solenoid Operators
(1) (Lower Containment)

MANUFACTURER: Valcor

MODEL #: V526

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: $1 \times 10^8 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 346°F Press: 113 psig RH: 100% Rad: $2 \times 10^8 R$ Chem Spray: Boric acid, and sodium hydroxide soln. 9.5 - 10.5 pH	30 days post DBE	31 days post DBE	N/A	N/A

SUBMERGENCE: Yes (Note 5)

QUALIFICATION REPORT: Valcor Report QR52600-6042-1 (CNM-1205.08-0047)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 18
Rev. 3

EQUIPMENT ID: Valve Solenoid Operators
(1) (Lower Containment)

MANUFACTURER: Valcor

MODEL #: V70900-21-3

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 346°F Press: 113 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, and sodium hydroxide soln. 1720-2200 ppm Boric acid 9.5 - 10.5 pH	5 minutes post DBE (Isolation function-Deenergize upon receipt of safety signal)	2 days post DBE	N/A	N/A

SUBMERGENCE: Yes (Note 5)

QUALIFICATION REPORT: Valcor Reports QR-52600-515, Rev. B; QR-70900-21-1, Rev. A; MR-70905-21-3-1 (CNM-1210.04-119, 253, 254 & MCM-1210.04-119)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: 5 years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

Page 18a
Rev. 3

EQUIPMENT ID: Valve Solenoid Operators
(1) (Upper & Lower Containment)

MANUFACTURER: Valcor

MODEL #: V70900-21-3

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 431°F Press: 87 psig Rad: 2.2x10 ⁸ R Chem Spray: Boron and sodium hydroxide 2000 ppm Boron pH 11.5	See JCO	See JCO	N/A	N/A

SUBMERGENCE: No

QUALIFICATION REPORT: Valcor Report QR70900-21-1/-3

METHOD: Test

REPLACEMENT INTERVAL: 5 years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: Valve Solenoid Operators
(1) Pressurizer PORVs
(Lower Containment)

MANUFACTURER: Valcor

MODEL #: V70900-301

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 346°F Press: 113 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, and sodium hydroxide soln. 1720-2200 ppm Boric acid 9.5 - 10.5 pH	5 minutes post DBE (Isolation function-Deenergize upon receipt of safety signal)	31 days post DBE (normally de-energized, cyclic operation)	N/A	N/A

SUBMERGENCE: No

QUALIFICATION REPORT: Valcor Reports QR-52600-515, Rev. B; MR-70500-39-10-1 (CNM-1210.04-254)

METHOD: Test/Similarity

REPLACEMENT INTERVAL: Later

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: Valve Solenoid Operators
(1) (Lower Containment)

MANUFACTURER: ASCO

MODEL #: NP831655E

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.1X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 346°F Press: 110 psig RH: 100% Rad: 2.0X10 ⁸ R Chem Spray: Boric acid, sodium thiosulfate, and sodium hydroxide soln. 3,000 ppm 10 pH	5 minutes post DBE (Isolation function)	30 days post DBE	N/A	N/A

SUBMERGENCE: No

QUALIFICATION REPORT: ASCO Report AQS21678/TR, Rev. A, July 1979 (CNM-1205.02-0499)

METHOD: Test

REPLACEMENT INTERVAL: 4 years for coils and elastomeric materials

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: Electric Hydrogen
(1) Recombiner
(Upper Containment)

MANUFACTURER: Westinghouse/Sturtevant MODEL #: B
(NSSS)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 180°F Press: 14.4 psig RH: 100% Rad: 8.1×10^7 R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 288°F Press: 77 psig RH: 100% Rad: 2×10^8 R Chem Spray: Boric acid and sodium hydroxide soln. 2550 ppm Boron 9 - 10.5 pH	3 months post DBE	1 year post DBE	N/A	N/A

SUBMERGENCE: No

QUALIFICATION REPORT: WCAP-7709-L and Supp. 2, 3, 4, 5, 6, and 7

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Containment Air Return
(1) Fan Motors
(Upper Containment)

MANUFACTURER: Joy/Reliance

MODEL #: 1XF-882739

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 180°F Press: 14.4 psig RH: 100% Rad: 1.1x10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 320°F Press: 85 psig RH: 100% Rad: 1x10 ⁹ R Chem Spray: Boric acid, sodium hydroxide and sodium thio- sulfate soln. 3000 ppm Boron 10.5 pH	2 months post DBE	1 year post DBE	N/A	N/A

SUBMERGENCE: No

QUALIFICATION REPORT: Joy/Reliance Reports X-604 (CNM-1211.00-1009); NUC-9 (CNM-1211.00-1010)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: Electrical Penetrations
(1) (Lower Containment)

MANUFACTURER: D. G. O'Brien Inc.

MODEL #: Type A

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 72 psig RH: 100% Rad: $1.3 \times 10^8 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 340°F Press: 72 psig RH: 100% Rad: $2 \times 10^8 R$ Chem Spray: Boric acid and sodium thiosulfate and sodium hydroxide soln. 4000 ppm Boron 8.8 pH	4 months post DBE	4 months post DBE	N/A	N/A

SUBMERGENCE: No

QUALIFICATION REPORT: D G O'Brien, Inc. Qualification Report No. ER-247 (CNM-1361.00-0015)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Electrical Penetrations
(1) (Lower Containment)

MANUFACTURER: D. G. O'Brien

MODEL #: Types B, C, D, F, G, H,
J, K, L, and M

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 340°F Press: 15 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid and sodium hydroxide soln. 4000 ppm Boron 8.8 pH	4 months post DBE	4 months post DBE	N/A	N/A
NOTE: All types must maintain containment leaktight integrity.					
NOTE: Types B, C, D, F, G, K and M have safety related electrical functions.					
NOTE: Type H has only a post accident monitoring (PAM) electrical function. The qualification for the Type H PAM electrical function will be provided consistent with our Reg. Guide 1.97 schedule (See JCO).					

SUBMERGENCE: No

QUALIFICATION REPORT: Wyle Laboratories Qualification Report No. 45869-1
D. G. O'Brien, Inc. Qualification Report No. ER-252 (CNM-1361.00-0016)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Electrical Penetrations
(1) (Lower Containment)

MANUFACTURER: Conax Corporation

MODEL #: Type N

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 350°F Press: 72 psig RH: 100% Rad: 1X10 ⁸ R Chem Spray: Boric acid 1800-2000 ppm Boron 6-10 pH	4 months post DBE	4 months post DBE	N/A	N/A

SUBMERGENCE: No

QUALIFICATION REPORT: Conax Qualification Report No. IPS-1037 (CNM-1361.00-0038)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Cable - (1) Hookup Wire (Lower Containment)	MANUFACTURER: Anaconda	MODEL #: FR-EPR Insulation (Procurement Spec: CNS-1354.04-00-0006)
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ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 385°F Press: 66 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, sodium phosphate, and hydrazine soln. 6200 ppm Boron 8.6 - 10 pH	4 months post DBE	4 months post DBE	N/A	N/A

SUBMERGENCE: Yes

QUALIFICATION REPORT: F-C4836-4 and 80282 (CNM-1354.00-0017 and 0025)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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EQUIPMENT ID: Cable -
(1) Medium Voltage Power
(Lower Containment)

MANUFACTURER: Anaconda

MODEL #: EPR
Insulation (Procurement
Specs: CNS-1354.01-00-0001
& 0003)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3X10 ⁸ R Chem Spray: Boric acid and sodium taborate soln.	Temp: 346°F Press: 113 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, sodium thiosulfate and sodium hydroxide soln. 3000 ppm Boron 9 - 11 pH	4 months post DBE	4 months post DBE	N/A	N/A

EMERGENCE: Yes

QUALIFICATION REPORT: F-C4350-3 (CNM-1354.00-0003)

TEST: Test

CEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Cable -
(1) Control
(Lower Containment)

MANUFACTURER: Anaconda

MODEL #: FR-EPR
Insulation (Procurement
Specs: CNS-1354.02-00-0001
& 0002)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 385°F Press: 66 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, sodium phosphate, sodium hydroxide and hydrazine soln. 6200 ppm Boron 8.6 - 10 pH	4 months post DBE	5 months post DBE	N/A	N/A

SUBMERGENCE: Yes

QUALIFICATION REPORT: F-C4969-1 and 80282 (CNM-1354.00-0009, CNM-1354.00-0025)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Cable -
(1) Instrumentation and Control
(Lower Containment)

MANUFACTURER: Anaconda

MODEL #: FR-EPR
Insulation (Procurement
Specs: CNS-1354.03-00-0001,
0002 & 0003)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 385°F Press: 66 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, sodium phosphate, and hydrazine soln. 6200 ppm Boron 8.6 - 10 pH	4 months post DBE	4 months post DBE	N/A	N/A

SUBMERGENCE: Yes

QUALIFICATION REPORT: F-C4836-2 and 80282 (CNM-1354.00-0020, CNM-1354.00-0025)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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EQUIPMENT ID: Cable -
(1) Coaxial
(Lower Containment)

MANUFACTURER: Brand-Rex

MODEL #: XLPE Insulation
(Procurement
Spec: CNS-1354.04-00-0004)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 385°F Press: 113 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, sodium phosphate, sodium hydroxide and hydrazine soln. 6200 ppm Boron 8.6 - 10 pH	4 months post DBE	4 months post DBE	N/A	N/A

SUBMERGENCE: Yes

QUALIFICATION REPORT: F-C5120-2 and F-C5120-3 (CNM-1354.00-0021 and CNM-1354.00-0024)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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EQUIPMENT ID: Cable - (1) Control (Lower Containment)	MANUFACTURER: Brand Rex	MODEL #: XLPE Insulation (Procurement Specs: CNS-1354.02-0001 & 0002)
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ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 385°F Press: 113 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, sodium phosphate, sodium hydroxide and hydrazine soln. 6200 ppm Boron 8.6 - 10 pH	4 months post DBE	4 months post DBE	N/A	N/A

SUBMERGENCE: Yes

QUALIFICATION REPORT: F-C5120-1 and FC5120-3 (CNM-1354.00-0023 and CNM-1354.00-0024)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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LOCATED INSIDE CONTAINMENT

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EQUIPMENT ID: Cable -
(1) Instrumentation and Control
(Lower Containment)

MANUFACTURER: Eaton

MODEL #: FR-EPDM
(Procurement
Specs: CNS-1354.03-00-0001,
0002 & 0003)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.2x10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 327°F Press: 15 psig RH: 100% Rad: 2x10 ⁸ R Chem Spray: Boric acid and sodium tetraborate solution 3,000 ppm 10 pH	4 months post DBE	4 months post DBE	N/A	N/A

SUBMERGENCE: Yes

QUALIFICATION REPORT: E17168-31 and DQAP/CRC0002 (CNM-1354.00-0018 and CNM-1354.00-0052)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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EQUIPMENT ID: Cable -
(1) Control
(Lower Containment)

MANUFACTURER: Okonite

MODEL #: FR-EPR
Insulation (Procurement
Specs: CNS-1354.02-00-0001
& 0002)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 346°F Press: 113 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, sodium thiosulfate, and sodium hydroxide soln. 3000 ppm Boron 10.5 pH	4 months post DBE	4 months post DBE	N/A	N/A

SUBMERGENCE: Yes

QUALIFICATION REPORT: Okonite Report FN-1 (CNM-1354.00-0006)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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EQUIPMENT ID: Cable - (1) Hookup wire (Lower Containment)	MANUFACTURER: Okonite	MODEL #: Tefzel Insulation (Procurement Spec: CNS-1354.04-00-0006)
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ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 341°F Press: 112 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, sodium thiosulfate, and sodium hydroxide soln. 3000 ppm Boron 10.5 pH	4 months post DBE	4 months post DBE	N/A	N/A

SUBMERGENCE: Yes

QUALIFICATION REPORT: Okonite Report K-0-1 (CNM-1354.00-0004)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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EQUIPMENT ID: Cable Termination and
(1) Splice Material
(Lower Containment)

MANUFACTURER: Raychem

MODEL #: WCSF-N

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3X10 ⁸ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 360°F Press: 70 psig RH: 100% Rad: 2X10 ⁸ R Chem Spray: Boric acid, sodium thiosulfate and sodium hydroxide soln. 3000 ppm Boron 9.5 - 11 pH	4 months post DBE	4 months post DBE	N/A	N/A

SUBMERGENCE: Yes

QUALIFICATION REPORT: F-C4033-3 and 71100 (CNM-1367.01-0002)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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EQUIPMENT ID: Seal Material for Cable
(1) Entrance Fittings
(Lower Containment)

MANUFACTURER: 3M

MODEL #: Scotch Cast 9 Epoxy
(XR-5240)

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: $1.1 \times 10^8 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 350°F Press: 18 psig RH: 100% Rad: $2 \times 10^8 R$ Chem Spray: Boric acid, sodium thiosulfate and sodium hydroxide 3000 ppm Boron pH 10.5	4 months post-DBE	4 months post-DBE	N/A	N/A

SUBMERGENCE: Yes

QUALIFICATION REPORT: CNC-1381.05-00-0039 and Wyle Report #44390-1, Rev. A (CNM-1364.00-0001)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED INSIDE CONTAINMENT

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EQUIPMENT ID: Incore Thermocouple System
(1) Cable and Connectors

MANUFACTURER: Combustion Engineers

MODEL #: N/A

ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 327°F Press: 14.4 psig RH: 100% Rad: 1.3×10^8 R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 460°F Press: 100 psig RH: 100% Rad: 2.1×10^8 R Chem Spray: Boric acid and sodium hydroxide 3000ppm Boron pH 10.3	4 months post-DBE	4 months post-DBE	N/A	N/A

SUBMERGENCE: N/A

QUALIFICATION REPORT: Combustion Engineering Report No. 17682-CCE-SR80-1, Rev. 00

METHOD: Test

REPLACEMENT INTERVAL: 18 months (insulating grommet only)

ECSE

CATAWBA NUCLEAR STATION UNITS 1 AND 2
ENVIRONMENTAL QUALIFICATION OF CLASS 1E
EQUIPMENT LOCATED INSIDE CONTAINMENT

Note 1

All equipment identified in this table is located inside the containment, specifically in the lower compartment except for the electric hydrogen recombiner, containment air return fan motors, hydrogen skimmer fan motors, containment air return isolation damper motors, differential pressure switches for damper control and cables associated with these devices which are located in the upper compartment.

Note 2

The parameters that compose the overall worst-case containment accident environment are as follows:

Temperature (Upper Compartment): 180°F, time history as shown in FSAR, Figure 6.2.1-6.

Temperature (Lower Compartment): 327°F peak-time history as shown in FSAR, Figure 6.2.1-16.

Pressure (Upper and Lower Compartment): 14.4 psig peak; time history as shown in FSAR, Figure 6.2.1-5.

Relative Humidity: 100%

Radiation: Total integrated radiation dose for the equipment location includes 40 year normal operating dose plus the appropriate accident dose.

Chemical Spray: Boric acid and sodium tetraborate spray resulting from mixing in the containment sump of borated water from the refueling water storage tank and sodium tetraborate solution from ice bed melt. Refer to FSAR, Section 6.1.1.2 for additional information on chemical spray.

Submergence: Containment flood level is elevation 571+0.

Note 3

Equipment performs its safety function prior to submergence. Further, failure of this equipment as a result of submergence will not preclude the safety function of other equipment claimed in the accident analysis. Additionally, the information provided by this equipment is not employed as a post accident monitoring parameter for operator action.

Note 4

RTD's are a sealed, water tight unit.

Note 5

Refer to FSAR response to question 440.48.

Note 6

The detector assembly by virtue of its construction and function is not susceptible to radiation degradation.

Note 7

Overall system accuracy should be within a factor of 2 over the entire range as stated in Regulatory Guide 1.97, rev. 2*. The calibrated accuracy of the system is $\pm 20\%$ of the system's range.

Note 8

Valve motor operators are selected for use with a particular valve by the valve manufacturer based on plant specific requirements and motor operator rated speed and torque characteristics. The motor operator environmental qualification documentation demonstrates that the motor operator can deliver rated speed and torque under harsh environmental conditions. Required valve response time is therefore assured by application of a qualified motor operator (based on rated speed and torque) with proper operating gearing.

ATTACHMENT 2

SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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3	1				
4	D				
5	1				
6	D				
7	3				
8	3				
9	3				
10	3				
11	3				
12	3				
13	3				
14	3				
15	3				
16	3				
17	3				
18	3				
19	1				
20	3				
21	3				
22	3				
23	3				
24	3				
25	1				
26	1				
27	2				
AN-1	3				
AN-2	3				

*D - Deleted

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

Page 1
Rev. 3

EQUIPMENT ID: Transmitter -
Steam Generator Level (N/R)

MANUFACTURER: Barton
(NSSS)

MODEL #: 764
(Lot 2)

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 3.8X10 ⁷ R	Temp: 380°F RH: 100% Rad: 5X10 ⁷ R	Reactor Trip (<5 minutes) plus 4 months post DBE	4 months post DBE	Trip Function: +5% (5 min) PAM Function: ±25% (4 mo)	< + 5% (5 min) Max Error 15% (4 mo)

QUALIFICATION REPORT: WCAP 9885 (CNM-1399.03-318)

METHOD: Test

REPLACEMENT INTERVAL: 10 Years

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Transmitter -
Steam Generator Level (W/R)

MANUFACTURER: Barton

MODEL #: 764

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 147°F RH: 100% Rad: 1.5×10^7 R	Temp: 420°F RH: 100% Rad: 2.0×10^8 R	4 months post DBE	1 year post DBE	±25%	±10%

QUALIFICATION REPORT: Barton R3-764-3 (CNM-1210.04-261)

METHOD: Test

REPLACEMENT INTERVAL: 10 Years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

Page 3
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EQUIPMENT ID: Transmitter -
Main Steam Flow

MANUFACTURER: Veritrak
(NSSS)

MODEL #: 76DP

ACCIDENT
ENVIRONMENT
(1)

ENVIRONMENT
TO WHICH
QUALIFIED

OPERABILITY
REQUIRED IN
ACCIDENT
ENVIRONMENT

OPERABILITY
DEMONSTRATED
(2)

ACCURACY
REQUIRED
(% OF SPAN)

ACCURACY
DEMONSTRATED
(% OF SPAN)

The Main Steam Flow signals are not required for accidents that cause a change in the normal annulus operating environment. Further, failure of these transmitters as a result of exposure to a harsh environment will not preclude the safety function of other equipment claimed in the accident analysis. Additionally, the information provided by these transmitters is not employed as a post accident monitoring parameter for operator action.

QUALIFICATION REPORT: N/A

METHOD: N/A

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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Rev. 1

EQUIPMENT ID: Transmitter -
Containment Sump Level

MANUFACTURER: Barton

MODEL #: 386A

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 4.5×10^7 R	Temp: 160°F RH: 100% Rad: 2.0×10^8 R	4 months post DBE	1 year post DBE	±5% loop	±12.06% inst.

QUALIFICATION REPORT: Wyle Report 43904-1 Vol. I-Rev.C, Vol. II-Rev.B (CNM-1210.04-252)

METHOD: Test

REPLACEMENT INTERVAL: 10 Years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Transmitter -
RCS Pressure (W/R)

MANUFACTURER: Barton
(NSSS)

MODEL #: 763
(Lot 2)

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1.7X10 ⁵ R	Temp: 380°F RH: 100% Rad: 5X10 ⁷ R	2 weeks post DBE	4 months post DBE	±10%	Max Error 6.1%

QUALIFICATION REPORT: WCAP 9885 (CNM-1399.03-318)

METHOD: Test

REPLACEMENT INTERVAL: 10 Years

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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Rev. 3

EQUIPMENT ID: Limit Switches

MANUFACTURER: NAMCO

MODEL #: EA-180

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1X10 ⁴ R	Temp: 340°F RH: 100% Rad: 2X10 ⁸ R	5 minutes post DBE	30 days post DBE	N/A	N/A

QUALIFICATION REPORT: NAMCO Test Report dated September 5, 1978 (CNM-1205.19-0041)

METHOD: Test

REPLACEMENT INTERVAL: 4 Years

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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Rev. 3

EQUIPMENT ID: Valve Motor Operators

MANUFACTURER: Rotork

MODEL #: NA-1

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1×10^4 R	Temp: 340°F RH: 100% Rad: 2×10^8 R	5 minutes post DBE	30 days post DBE	Note 6	Note 6

QUALIFICATION REPORT: Rotork Report N 11/4, December 1970; TR 116, October 1973; and TR 222, June 1975
(CNM-1205.19-0006, 7, & 8)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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Rev. 3

EQUIPMENT ID: Valve Motor Operators

MANUFACTURER: Limitorque

MODEL #: SMB RH Insulation

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1×10^4 R	Temp: 340°F RH: 100% Rad: 2×10^8 R	5 minutes post DBE	30 days post DBE	Note 6	Note 6

QUALIFICATION REPORT: Limitorque Report 6CJ-376-A, September 1972; 600-456, December 1975 (CNM-1205.19-0001)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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Rev. 3

EQUIPMENT ID: Valve Solenoid Operators

MANUFACTURER: ASCO

MODEL #: NP831655E

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1×10^4 R	Temp: 346°F RH: 100% Rad: 2.0×10^8 R	5 minutes post DBE	30 days post DBE	N/A	N/A

QUALIFICATION REPORT: ASCO Report AQS21678/TR Rev. A, July 1979, (CNM-1205.02-0499)

METHOD: Test

REPLACEMENT INTERVAL: 4 years for coils and elastomeric materials

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Cable -
Hookup Wire

MANUFACTURER: Anaconda

MODEL #: FR-EPR
Insulation
(Procurement Spec.
CNS-1354.04-00-0006)

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1×10^8 R	Temp: 194°F RH: 100% Rad: 2×10^8 R (Note 4)	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: F-C4836-4 and 80282 (CNM-1354.00-0017 and CNM-1354.00-0025)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Cable -
Medium Voltage and Power

MANUFACTURER: Anaconda

MODEL #: EPR
Insulation (Procurement
Specs: CNS-1354.01-00-000
& 0003)

ACCIDENT ENVIRONMENT (1)		ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp:	150°F	Temp:	194°F	4 months	N/A	N/A
RH:	100%	RH:	100%	post DBE		
Rad:	1X10 ⁸ R	Rad:	2X10 ⁸ R (Note 4)			

QUALIFICATION REPORT: F-C4350-3 (CNM-1354.00-0003)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Cable - Category C and D
Control

MANUFACTURER: Anaconda

MODEL #: FR-EPR
Insulation (Procurement
Specs: CNS-1354.02-00-000
& 0002)

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1X10 ⁸ R	Temp: 194°F RH: 100% Rad: 2X10 ⁸ R (Note 4)	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: F-C4969-1 and 80282 (CNM-1354.00-0009 and CNM-1354.00-0025)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Cable -
Instrumentation and Control

MANUFACTURER: Anaconda

MODEL #: FR-EPR
Insulation (Procurement
Specs: CNS-1354.03-00-000
0002 & 0003)

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1X10 ⁸ R	Temp: 194°F RH: 100% Rad: 2X10 ⁸ R (Note 4)	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: F-C4836-2 and 80282 (CNM-1354.00-0020 and CNM-1354.00-0025)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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Rev. 3

EQUIPMENT ID: Cable -
Low Voltage Power

MANUFACTURER: Anaconda

MODEL #: FR-EPR
Insulation (Procurement
Spec: CNS-1354.01-00-000

ACCIDENT ENVIRONMENT (1)		ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp:	150°F	Temp:	194°F	4 months	N/A	N/A
RH:	100%	RH:	100%	post DBE		
Rad:	1X10 ⁸ R	Rad:	2X10 ⁸ R (Note 4)			

QUALIFICATION REPORT: F-C4350-2 (CNM-1354.00-0002)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Cable -
Control

MANUFACTURER: Brand-Rex

MODEL #: XLPE
Insulation (Procurement
Specs: CNS-1354.00-00-0001
& 0002)

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1×10^8 R	Temp: 194°F RH: 100% Rad: 2×10^8 R (Note 4)	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: F-C5120-1 and F-C5120-3 (CNM-1354.00-0023 and CNM-1354.00-0024)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Cable -
Coaxial

MANUFACTURER: Brand-Rex

MODEL #: XLPE
Insulation (Procurement
Spec: CNS-1354.04-00-0004

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1X10 ⁸ R	Temp: 194°F RH: 100% Rad: 2X10 ⁸ R (Note 4)	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: F-C5120-2 and F-C5120-3 (CNM-1354.00-0021 and CNM-1354.00-0024)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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Rev. 1

EQUIPMENT ID: Cable -
Instrumentation and Control

MANUFACTURER: Eaton

MODEL #: FR-EPDM
Insulation (Procurement Specs:
CNS-1354.03-00-0001, 0002 &
0003)

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: $1 \times 10^8 \text{R}$	Temp: 327° RH: 100% Rad: $2.0 \times 10^8 \text{R}$	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: E17168-31, DQAP/CRC0002 (CNM-1354.00-0018 & CNM-1354.00-0052)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Cable -
Medium Voltage

MANUFACTURER: Okonite

MODEL #: EPR
Insulation (Procurement Specs:
CNS-1354.01-00-0001 & 0003)

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1X10 ⁸ R	Temp: 194°F RH: 100% Rad: 2X10 ⁸ R (Note 4)	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: Okonite Report G-3 (CNM-1354.00-0007)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Cable -
Control

MANUFACTURER: Okonite

MODEL #: FR-EPR
Insulation (Procurement
Spec: CNS-1354.02-00-0001
& 0002)

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: $1 \times 10^8 \text{R}$	Temp: 194°F RH: 100% Rad: $2 \times 10^8 \text{R}$ (Note 4)	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: Okonite Report FN-1 (CNM-1354.00-0006)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Cable -
Hookup wire

MANUFACTURER: Okonite

MODEL #: Tefzel

Insulation (Procurement)
Spec: 1354.04-00-000

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: $1 \times 10^8 R$	Temp: 194°F RH: 100% Rad: $2 \times 10^8 R$ (Note 4)	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: Okonite Report K-0-1 (CNM-1354.00-0004)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Cable Termination
Splice Material

MANUFACTURER: Ray Chem

MODEL #: WCSF-N

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1×10^8 R	Temp: 194°F RH: 100% Rad: 2×10^8 R (Note 4)	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: Test Reports F-C4033-3 and 71100 (CNM-1367.01-0002)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED IN THE ANNULUS

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EQUIPMENT ID: Seal Material for Cable
Entrance Fittings

MANUFACTURER: 3M

MODEL #: Scotch Cast 9 Epoxy
(XR-5240)

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 150°F RH: 100% Rad: 1X10 ⁸ R	Temp: 350°F RH: 100% Rad: 2x10 ⁸ R	4 months post DBE	4 months post DBE	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0039 and Wyle Report #44390-1, Rev. A (CNM-1364.00-0001)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: 1TBOX0001
(Note 5)

MANUFACTURER: Duke

MODEL #: N/A

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 147°F RH: 100% Rad: 1.3X10 ⁷ R	Temp: 212°F RH: 100% Rad: 3.0X10 ⁷ R	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: 1TBOX0002
(Note 5)

MANUFACTURER: Duke

MODEL #: N/A

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 147°F RH: 100% Rad: 1.3X10 ⁷ R	Temp: 212°F RH: 100% Rad: 3.0X10 ⁷	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: 1TBOX0327
(Note 5)

MANUFACTURER: Duke

MODEL #: N/A

ACCIDENT ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT	OPERABILITY DEMONSTRATED (2)	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 147°F RH: 100% Rad: 1.5X10 ⁷ R	Temp: 330°F RH: 100% Rad: 3.0X10 ⁷ R	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

CATAWBA NUCLEAR STATION - UNITS 1 AND 2

ENVIRONMENTAL QUALIFICATION OF CLASS 1E
EQUIPMENT LOCATED IN THE ANNULUS

Note 1

The environmental conditions in the annulus (primarily temperature and radiation) are dictated by the containment environment because of the physical arrangement of the annulus with respect to the containment. Therefore, the worst case annulus temperature and radiation environment is based on the worst case containment accident environment. Additionally, there are no pipe ruptures postulated in the annulus that cause a pressure excursion nor is there chemical spray in the annulus.

The parameters that compose the overall worst case annulus environment are as follows:

Temperature: 150°F

Relative Humidity: 100%

Radiation: Total integrated radiation dose for the equipment location includes the 40 year normal operating dose plus the appropriate accident dose based on the equipment operability requirements.

Submergence: Annulus Flood Level is 554' & 0". No safety-related electrical equipment is located below this level.

Note 2

The operability time demonstrated is the period required for the equipment to reach its qualified radiation dose in the accident environment. Temperature transients in the annulus, due to a MSLB or LOCA inside containment, are minimal and well within the design capabilities of the equipment. Therefore, temperature is not a factor in operability time.

Note 3

Deleted.

Note 4

The qualified temperature is based on the insulation rating of the cable (90°C). The temperature of the insulation is a function of the cable conductor temperature and ambient temperature.

Note 5

The equipment listed is a NEMA 4 enclosure containing general application devices (e.g., relays, switches, terminal blocks, etc.). The qualified environment is dictated by the single limiting device contained in the enclosure. The enclosure and device qualification is documented in calculation CNC-1381.05-0054.

Note 6

Valve motor operators are selected for use with a particular valve by the valve manufacturer based on plant specific requirements and motor operator rated speed and torque characteristics. The motor operator environmental qualification documentation demonstrates that the motor operator can deliver rated speed and torque under harsh environmental conditions. Required valve response time is therefore assured by application of a qualified motor operator (based on rated speed and torque) with proper operating gearing.

ATTACHMENT 3

SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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1	2	35	1	78	D
2	D	36	3	79	1
3	1	37	1	PRN-1	3
4	1	38	1		
5	3	39	D		
6	2	40	3		
7	3	41	D		
8	1	42	3		
9	3	43	3		
10	3	44	3		
11	3	45	3		
12	D	46	3		
13	3	47	3		
14	3	48	3		
15	D	49	3		
16	D	50	3		
17	3	51	3		
18	2	52	3		
19	3	53	3		
20	3	54	3		
21	3	55	D		
22	3	56	3		
23	1	57	2		
24	1	58	2		
25	1	59	2		
26	1	60	2		
27	1	61	D		
28	D	62	D		
29	1	63	2		
30	1	64	1		
31	D	65	1		
32	2	66	1		
33	2	67	1		
34	2	68	1		
		69	1		
		70	1		
		71	1		
		72	1		
		73	1		
		74	1		
		75	1		
		76	1		
		77	D		

- Deleted

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

Page 1
Rev. 2

EQUIPMENT ID: Transmitter -
Main Feedwater Flow

MANUFACTURER: Veritrak
(NSSS)

MODEL #: 76DP

PIPE RUPTURE
ENVIRONMENT
(1)

ENVIRONMENT
TO WHICH
QUALIFIED

OPERABILITY
REQUIRED IN
PIPE RUPTURE
ENVIRONMENT(2)

OPERABILITY
DEMONSTRATED

ACCURACY
REQUIRED
(% OF SPAN)

ACCURACY
DEMONSTRATED
(% OF SPAN)

The Main Feedwater Flow signals are not required for pipe ruptures that cause a change in the normal Auxiliary Building (Doghouse) operating environment. Further, failure of this equipment as a result of exposure to a harsh environment will not preclude the safety function of other equipment claimed in the accident post accident analysis. Additionally, the information provided by this equipment is not employed as a post accident monitoring parameter for operator action.

QUALIFICATION REPORT: N/A

METHOD: N/A

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

Page 3
Rev. 1

EQUIPMENT ID: Transmitter -
NW Surge Chamber Level
A and B

MANUFACTURER: Barton

MODEL #: 386A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 157°F	172°F	Continuous	Continuous	±31.7%	±12.3%

QUALIFICATION REPORT: Wyle Report #43904-1 Vol. I-Rev. C, Vol. II-Rev.B (CNM-1210.04-252)

METHOD: Test

REPLACEMENT INTERVAL: 10 Years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

Page 4
Rev. 1

EQUIPMENT ID: Transmitter - Component Cooling
Heat Exchanger Inlet Flow

MANUFACTURER: Rosemount

MODEL #: 1153DB4

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 318°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: Rosemount Reports 108025 and 108026

METHOD: Test/Analysis

REPLACEMENT INTERVAL: 10 Years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

Page 5
Rev. 3

EQUIPMENT ID: Transmitter-
Boric Acid Tank Level

MANUFACTURER: Rosemount

MODEL #: 1153DB4

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 318°F	Continuous	Continuous	±13.5%	±13.1%

QUALIFICATION REPORT: Rosemount Report 108025 and 108026

METHOD: Test

REPLACEMENT INTERVAL: 10 Years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

Page 6
Rev. 2

EQUIPMENT ID: Transmitter-
Aux. FW Flow

MANUFACTURER: Barton

MODEL #: 764

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 Psig	Temp: 420°F Press: 75 Psig	4 months	1 yr. Post DBE	Later	±10%

QUALIFICATION REPORT: Barton R3-764-9 (CNM-1210.04-0261)

METHOD: Test

REPLACEMENT INTERVAL: 10 Years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 3

EQUIPMENT ID: D/P Switch
RHR Pump Minimum Flow

MANUFACTURER: Barton

MODEL #: 580A-0

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 248°F	Temp: 340°F	Continuous	Continuous	Later	Later

QUALIFICATION REPORT: Barton Report #548-8890 Rev. A and Report #R3-580A-9

METHOD: Test

REPLACEMENT INTERVAL: 10 years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 1

EQUIPMENT ID: D/P Switch
KC HX A&B Inlet Flow

MANUFACTURER: Barton

MODEL #: 581A-0

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 340°F	Continuous	Continuous	±5.0%	±5.0%

QUALIFICATION REPORT: Barton Report #548-8890 Rev. A

METHOD: Test

REPLACEMENT INTERVAL: Later

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: D/P Switch
CA pumps - Loss of Suction

MANUFACTURER: Barton

MODEL #: 580A-1

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: Ambient	Temp: 340°F	Continuous	Continuous	±12.3%	±12.3%

QUALIFICATION REPORT: Barton Report #548-8890 Rev. A and Report #R3-580A-9

METHOD: Test

REPLACEMENT INTERVAL: 10 years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 3

EQUIPMENT ID: D/P Switch-
KC Surge Tank Level

MANUFACTURER: Barton

MODEL #: 580A-1

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 127°F	Temp: 340°F	Continuous	Continuous	±5.0%	±3.1%

QUALIFICATION REPORT: Barton Report #548-8890 Rev. A and Report #R3-580A-9

METHOD: Test

REPLACEMENT INTERVAL: 10 years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Pressure Switch-
NW Surge Chamber Pressure

MANUFACTURER: SOR Inc.

MODEL #: 12NG-B4-NX-CIA

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 250°F	Continuous	Continuous	±6.5%	±2.0%

QUALIFICATION REPORT: Later - Results forwarded by letter

METHOD: Test

REPLACEMENT INTERVAL: N/A

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Level Switches-
ND & NS Room Sump Level

MANUFACTURER: Magnetrol

MODEL #: A-103F-3X-Y-MPG

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 285°F	Continuous	Continuous	+3"-increasing level -5½"-decreasing level	+3"-increasing level -5½"-decreasing level

QUALIFICATION REPORT: Duke Power Co. Reports TR-053 & TR-060

METHOD: Test

REPLACEMENT INTERVAL: 15 Years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Level Switches-Doghouse Level

MANUFACTURER: Magnetrol

MODEL #: A-103F-3X-Y-MPG

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 240°F Press: 8.85 psig	Temp: 285°F Press: 30 psig	Approximately 15 secs. prior to accomplishment of trip function, i.e., trip main fdw pumps	Continuous	± 1/4 inch	± 1/4 inch

QUALIFICATION REPORT: Duke Power Company Reports TR-053 and TR-060

METHOD: Test

REPLACEMENT INTERVAL: 15 Years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Stem Mounted Limit Switch

MANUFACTURER: NAMCO

MODEL #: EA-180

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 340°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: NAMCO report dated September 5, 1978 (COM-1205.19-0041) and QTR-105 (CNM-1211.00-1570)

METHOD: Test

REPLACEMENT INTERVAL: 4 Years

MEQP/MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 2

EQUIPMENT ID: Stem Mounted Limit Switches

MANUFACTURER: NAMCO

MODEL #: EA-170-302

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 212°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: NAMCO report dated July 24, 1978, report QTR-107 and NAMCO letter dated 4/9/81

METHOD: Test

REPLACEMENT INTERVAL: 4 Years

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Stem Mounted Limit Switches

MANUFACTURER: NAMCO

MODEL #: EA-740

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 340°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: NAMCO report dated February 22, 1979 (CNM-1205.19-0041)

METHOD: Test

REPLACEMENT INTERVAL: 4 years

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Fuel Handling Area Exhaust
Fan Motors

MANUFACTURER: Reliance

MODEL #: 1YF882585, 2YF882585,
1YF882745

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 147°F	Temp: 161°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: NUC-9 (CNM-1320.00-0003) and Thermal Life Calculation (CNC-1381.05-00-0056)

METHOD: Test and Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Auxiliary Building Filtered
Exhaust Fan Motors

MANUFACTURER: Reliance

MODEL #: 1XF-882610, 2XF-882610
1XF-882771

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 127°F	Temp: 141°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: NUC-9 (CNC-1320.00-0003) and Thermal Life Calculation (CNC-1381.05-00-0056)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Residual Heat Removal
Pump Motors

MANUFACTURER: Westinghouse, Buffalo MODEL #: VSHX (TEWC)
(NSSS)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 221°F	150 Minutes	Continuous	N/A	N/A

QUALIFICATION REPORT: WCAP 8754

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Centrifugal Charging Pump
Motors

MANUFACTURER: Westinghouse, Buffalo
(NSSS)

MODEL #: LLD-TEWC

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 221°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: WCAP 8754, Rev. 1

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Safety Injection Pump
Motors

MANUFACTURER: Westinghouse, Buffalo
(NSSS)

MODEL #: LAC-TEWC

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 221°F	150 Minutes	Continuous	N/A	N/A

QUALIFICATION REPORT: WCAP 8754, Rev. 1

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Component Cooling Pump
Motors

MANUFACTURER: Westinghouse, Buffalo

MODEL #: 74F18651 S/N 1,2,3,&4
74F19752 S/N 1,2,3,&4

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 212°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNM-1318.00-0004; CNC-1381.05-00-042; CNC-1381.05-00-049

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Fuel Pool Cooling Pump
Motors

MANUFACTURER: Westinghouse, Buffalo

MODEL #: 73F69065 S/N 1&2
73F69066 S/N 1&2

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 163°F	Temp: 212°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNM-1318.00-0004; CNC-1381.05-00-042; CNC-1381.05-00-049

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Containment Spray Pump
Motors

MANUFACTURER: Westinghouse, Buffalo

MODEL #: 74F18671 S/N 1&2
74F18672 S/N 1&2

PIPE RUPTURE
ENVIRONMENT
(1)

ENVIRONMENT
TO WHICH
QUALIFIED

OPERABILITY
REQUIRED IN
PIPE RUPTURE
ENVIRONMENT(2)

OPERABILITY
DEMONSTRATED

ACCURACY
REQUIRED
(% OF SPAN)

ACCURACY
DEMONSTRATED
(% OF SPAN)

Temp: 212°F

Temp: 212°F

Later

Continuous

N/A

N/A

QUALIFICATION REPORT: CNM-1318.00-0004; CNC-1381.05-00-042; CNC-1381.05-00-049

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Boric Acid Transfer Pump
Motors

MANUFACTURER: Westinghouse/Chempump
(NSSS)

MODEL #: GVH-10K-12H-1S

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 212°F	150 Minutes	Continuous	N/A	N/A

QUALIFICATION REPORT: Based on standard rating of Class H insulation

NOTE: Pump is a "canned pump." Motor is enclosed in a sealed casing and is cooled by the pumpage; therefore, the motor is not exposed to external temperature environment.

METHOD: Analysis

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Containment Spray & Residual
Heat Removal Pump Room Sump
Pump Motors

MANUFACTURER: Reliance

MODEL #: 1YF882456, 1YF882767

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 226°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: Thermal Life Calculation (CNC-1381.05-00-0056)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Main Steam Isolation
Valve (Doghouse)

MANUFACTURER: Atwood and Morrill

MODEL #: MSI Valve Actuator
Assembly

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 340°F Press: 110 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: Procedure 201-39500, Test Report STR-060578-1 (CNM-1205.12-0009)

METHOD: Test

REPLACEMENT INTERVAL: SLND & Elastomers - 5 years

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 2

EQUIPMENT ID: Feedwater Isolation
Valve

MANUFACTURER: Borg-Warner (NVD)

MODEL #: Pneumatic-Hydraulic
Operator P/N 38991

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 340°F Press: 110 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: 1736 (CNM-1205.12-0014)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 2

EQUIPMENT ID: Valve Motor Operators
(Doghouse)

MANUFACTURER: Limitorque

MODEL #: SMB RH Insulation

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 spig	Temp: 340°F Press: 105 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: 600-376-A, September 1972; 600-456, December 1975 (CNM-1205.19-0001)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Valve Motor Operators

MANUFACTURER: Limitorque

MODEL #: SMB B Insulation

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 250°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: B0003, May 1976 (CNM-1205.19-0001

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Valve Motor Operators

MANUFACTURER: Rotork

MODEL #: NA-1

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 340°F Press: 70 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: N 11/4, December 1970; TR116, October 1973; TR222, June 1975 (CNM-1205.19)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Valve Motor Operators

MANUFACTURER: Rotork

MODEL #: NA-2 with NA-1
Switch Mechanism

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 212°F	170 Minutes	200 Hours	N/A	N/A

QUALIFICATION REPORT: TR3025, April 1980; TR222, June 1975; N11/4 December 1970; TR116, October 1973 (CNM-1205.19-0006,7,8&9)

METHOD: Test

REPLACEMENT INTERVAL: N/A

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Valve Solenoid Operators

MANUFACTURER: Valcor

MODEL #: V526

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 346°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: QR52600-6042-1 (CNM-1205.08-0047)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Valve Solenoid Operators

MANUFACTURER: Valcor

MODEL #: V70900-21-3

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 346°F Press: 87 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: QR-70900-21-1 Rev. A; QR-52600-515 Rev. B, MR-70905-21-3-1 (CNM-1210.04-253 254 & MCM-1210.04-119)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: 5 Years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Cable -
Hookup Wire

MANUFACTURER: Anaconda

MODEL #: FR-EPR
Insulation (Procurement
Spec: CNS-1354.04-00-0006)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 385°F Press: 66 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: 80205-1 (CNM-1354.00-0019)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Cable -
Medium Voltage Power

MANUFACTURER: Anaconda

MODEL #: EPR
Insulation (Procurement
Specs: CNS-1354.01-00-0001
& 0003)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 346°F Press: 113 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: 80205-1 (CNM-1354.00-0019)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Cable -
Control

MANUFACTURER: Anaconda

MODEL #: FR-EPR
Insulation (Procurement
Specs: CNS-1354.02-00-0001
& 0002)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 385°F Press: 113 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: 80205-1 (CNM-1354.00-0019)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Cable -
Instrumentation and Control

MANUFACTURER: Anaconda

MODEL #: FR-EPR
Insulation (Procurement
Specs: CNS-1354.03-00-0001
0002 & 0003)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 385°F Press: 66 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: F-C4836-2 (CNM-1354.00-0020)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: Cable -
Low Voltage Power

MANUFACTURER: Anaconda

MODEL #: FR-EPR
Insulation (Procurement
Specs: CNS-1354.01-00-0001
& 0003)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 385°F Press: 113 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: 80205-1 (CNM-1354.00-0019)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: Cable -
Control

MANUFACTURER: Brand-Rex

MODEL #: XLPE
Insulation (Procurement
Specs: CNS-1354.02-00-0001
& 0002)

PIPE RUPTURE
ENVIRONMENT
(1)

ENVIRONMENT
TO WHICH
QUALIFIED

OPERABILITY
REQUIRED IN
PIPE RUPTURE
ENVIRONMENT(2)

OPERABILITY
DEMONSTRATED

ACCURACY
REQUIRED
(% OF SPAN)

ACCURACY
DEMONSTRATED
(% OF SPAN)

Temp: 330°F
Press: 113 psig

Temp: 385°F
Press: 113 psig

Continuous

Continuous

N/A

N/A

QUALIFICATION REPORT: FC-5120-1 and FC-5120-3 (CNM-1354.00-0023) and CNM-1354.00-0024

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Cable -
Coaxial

MANUFACTURER: Brand-Rex

MODEL #: XLPE
Insulation (Procurement
Spec: CNS-1354.04-00-0004)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 385°F Press: 113 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: FC-5120-2 and FC-5120-3 (CNM-1354.00-0021 and CNM-1354.00-0024)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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Rev. 3

EQUIPMENT ID: Cable -
Instrumentation and Control

MANUFACTURER: Eaton

MODEL #: FR-EPDM
Insulation (Procurement Specs:
CNS-1354.03-00-0001, 0002 & 0003)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 430°F Press: 15 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: Qualification test of electrical cables by Isomedix (CNM-1354.00-0035).

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Cable -
Medium Voltage

MANUFACTURER: Okonite

MODEL #: EPR
Insulation (Procurement
Specs: CNS-1354.01-00-0001
& 0003)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
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Temp: 330°F
Press: 8.85 psig

Temp: 455°F
Press: 32 psig

Continuous

Continuous

N/A

N/A

QUALIFICATION REPORT: Okonite Report #355 (CNM-1354.00-0022)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: Cable -
Control

MANUFACTURER: Okonite

MODEL #: FR-EPR
Insulation (Procurement
Specs: CNS-1354.02-00-0001
& 0002)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 455°F Press: 32 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: Okonite Report #355 (CNM-1354.00-0022)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: Cable -
Hookup Wire

MANUFACTURER: Okonite

MODEL #: Tefzel
Insulation (Procurement
Spec: CNS-1354.04-00-0006)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 455°F Press: 32, psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: Okonite Report #344 (CNM-1354.00-0026)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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Rev. 3

EQUIPMENT ID: Cable Termination
Splice Material

MANUFACTURER: Ray Chem

MODEL #: WCSF-N

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F Press: 8.85 psig	Temp: 360°F Press: 70 psig	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: 71100 & F-C4033-3 (CNM-1367.01-0001 & 2)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: Seal Material for Cable
Entrance Fittings

MANUFACTURER: 3M

MODEL #: Scotch Cast 9 Epoxy
(XR-5240)

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 330°F	350°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0039 and Wyle Report #44390-1, Rev. A (CNM-1364.00-0001)

METHOD: Test/Analysis

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1EATC12
(3)

MANUFACTURER: Duke

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	212°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: 1EATC13
(3)

MANUFACTURER: Duke

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 187°F	Temp: 212°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: 1ELCC0046
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 220°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: 1ELCP0112
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 127°F	Temp: 150°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
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EQUIPMENT ID: 1ELCP0113
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 147°F	Temp: 150°F	Continuous	Continuous	N/A	NA

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
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EQUIPMENT ID: 1ELCP0243
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 238°F	Temp: 255°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: 1ELMC0020

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 127°F	Temp: 212°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: 1ELMC0021
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 147°F	Temp: 212°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

Page 66
Rev 1

EQUIPMENT ID: IHSBP0001
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 187°F	Temp: 330°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT
MANUFACTURER: DUKE

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Rev. 1

EQUIPMENT ID: 1SMTCL
(3)

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 212°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 1

EQUIPMENT ID: 1TBOX0015
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 330°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 1

EQUIPMENT ID: 1TBOX0016
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 330°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 1

EQUIPMENT ID: 1TBOX0017
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 330°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 1

EQUIPMENT ID: 1TBOX0018
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 330°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: 1TBOX0019
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 330°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 1

EQUIPMENT ID: 1TBOX0020
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 330°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 1

EQUIPMENT ID: 1TBOX0021
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 330°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT. CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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Rev. 1

EQUIPMENT ID: 1TBOX0100
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 187°F	Temp: 212°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: 1TBOX0132
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 255°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: 1TBOX0481
(3)

MANUFACTURER: DUKE

MODEL #: N/A

PIPE RUPTURE ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN PIPE RUPTURE ENVIRONMENT(2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% OF SPAN)	ACCURACY DEMONSTRATED (% OF SPAN)
Temp: 212°F	Temp: 220°F	Continuous	Continuous	N/A	N/A

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2

ENVIRONMENTAL QUALIFICATION OF CLASS 1E ELECTRICAL
EQUIPMENT LOCATED OUTSIDE CONTAINMENT EXPOSED TO
PIPE RUPTURE ENVIRONMENTNote 1

The methods employed to evaluate pipebreaks and to determine the resulting environmental parameters are discussed in Section 3.6 of the Catawba FSAR.

Note 2

The pipe rupture environment is assumed to exist for 2 1/2 hours (except for one area of the Auxiliary Building, Elevation 543' which exists for 2 5/6 hours) based on 30 minutes at the peak temperature after which action by the operator isolated the break and allows the Auxiliary Building temperature to decrease to normal in 2 hours. Use of the term "Continuous" indicates operability required/ demonstrated throughout the pipe rupture period.

Pressure: Not a significant qualification parameter for pipe rupture outside the containment since all locations outside containment are open areas not susceptible to pressure build-up. It should be noted that the pressure in the doghouse is a spike (8.85 psig) of less than 1 sec. duration.

Relative Humidity: Not a significant qualification parameter for pipe rupture outside the containment due to the large open areas in which pipe ruptures occur and the relative short duration of the pipe rupture environment.

Radiation: There is no significant increase in radiation levels outside the containment as a result of a pipe rupture outside the containment.

Chemical Spray: Not a qualification parameter for pipe rupture outside the containment since there is no chemical spray outside the containment.

Submergence: Based on analysis performed by Duke Power Company, it has been determined that there is no safety-related electrical equipment, required to mitigate the event causing the flood (e.g., pipe rupture) or required to bring the plant to a safe shutdown condition given a flood event, located below the postulated flood levels.

Note 3

The equipment listed is a NEMA 4 enclosure containing general application devices (e.g., relays, switches, terminal blocks, etc.). The qualified environment is dictated by the single limiting device contained in the enclosure. The enclosure and device qualification is documented in calculation CNC-1381.05-00-0054.

ATTACHMENT 4

SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

<u>Page</u>	<u>Rev.</u>	<u>Page</u>	<u>Rev.</u>	<u>Page</u>	<u>Rev.</u>
1	1	36	1	70	3
2	1	37	1	71	3
3	1	38	1	72	3
4	1	39	2	73	3
5	1	40	2	74	0
6	D	41	1	75	0
7	1	42	1	76	0
8	D	43	1	77	0
9	3	44	1	78	0
10	D	45	1	79	0
11	D	46	1	80	0
12	3	47	1	RN-1	1
13	1	48	1		
14	2	49	1		
15	2	50	1		
16	1	51	1		
17	D	52	3		
18	D	53	1		
19	3	54	0		
20	1	55	D		
21	1	56	2		
22	D	57	2		
23	2	58	1		
24	3	59	3		
25	3	60	3		
26	3	61	3		
27	3	62	3		
28	3	63	D		
29	3	64	3		
29A	3	65	3		
30	3	66	3		
31	D	67	3		
32	1	68	3		
33	1	69	3		
34	1				
35	1				

*D - Deleted

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

Page 1
Rev. 1

EQUIPMENT ID: Transmitter -
(1) NW Surge Chamber Level

MANUFACTURER: Barton

MODEL #: 386A

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.0 \times 10^3 \text{ RAD}$

$2.0 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: Wyle Report #43904-1 Vol. I Rev. C, Vol. II-Rev. B (CNM-1210.04-252)

METHOD: Test

REPLACEMENT INTERVAL: 10 years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

Page 2
Rev. 1

EQUIPMENT ID: Pressure Transmitter (HVAC)
(1)

MANUFACTURER: Rosemount

MODEL #: 1152

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$4.9 \times 10^5 \text{ RAD}$

$5.0 \times 10^6 \text{ RAD}$

QUALIFICATION REPORT: Rosemount Test Report 38019 (CNM-1211.00-1778)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MHVC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

Page 3
Rev. 1

EQUIPMENT ID: Transmitter -
(1) Containment Pressure (NR)

MANUFACTURER: Barton

MODEL #: 386A

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.0 \times 10^3 \text{ RAD}$

$2.0 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: Wyle Report #43904-1, Vol. I - Rev. C, Vol. II - Rev. B (CNM-1210.04-252)

METHOD: Test

REPLACEMENT INTERVAL: 10 years

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

Page 4
Rev. 1

EQUIPMENT ID: Transmitter -
(1) Containment Pressure

MANUFACTURER: Rosemount

MODEL #: 1153DB6

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.0 \times 10^3 \text{ RAD}$

$2.4 \times 10^7 \text{ RAD}$

QUALIFICATION REPORT: Rosemount Reports 108025 and 108026

METHOD: Test/Analysis

REPLACEMENT INTERVAL: 10 years

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

Page 5
Rev. 1

EQUIPMENT ID: Pressure Transmitter-
(1) Annulus Pressure

MANUFACTURER: Barton

MODEL #: 386A

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.0 \times 10^3 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: Wyle Report #43904-1, Vol. I - Rev. C, Vol. II - Rev. B (CNM-1210.04-252)

METHOD: Test

REPLACEMENT INTERVAL: 10 years

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

Page 7
Rev. 1

EQUIPMENT ID: NSR Filters/Differential
(1) Pressure Transmitter

MANUFACTURER: Foxboro

MODEL #: N-E10 Series

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2 \times 10^7 \text{ RAD}$

$2.2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: 45592-4 (CNM-1211.00-1792)

METHOD: Test

REPLACEMENT INTERVAL: 9 years for cover gasket
20 years for transmitter

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

Page 9
Rev. 3

EQUIPMENT ID: Differential Pressure Switch
(1)

MANUFACTURER: Solon

MODEL #: 7PS11DW

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$3 \times 10^5 \text{ RAD}$

$1.82 \times 10^6 \text{ RAD}$

QUALIFICATION REPORT: MCM-1211.00-1645

METHOD: Test

REPLACEMENT INTERVAL: 10 years

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Pressure Switch -
(1) NW Surge Chamber Pressure

MANUFACTURER: SOR Inc.

MODEL #: 12N-B4-NX-C

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.0 \times 10^3 \text{ RAD}$

$3.3 \times 10^7 \text{ Rad}$

QUALIFICATION REPORT: Later - Results forwarded by letter.

METHOD: Test

REPLACEMENT INTERVAL: N/A

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: D/P Switch -
(1) KC Surge Tank Level

MANUFACTURER: Barton

MODEL #: 580A-1

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$3.1 \times 10^5 \text{ RAD}$

$2.0 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: Barton Report #548-8890 Rev. A

METHOD: Test

REPLACEMENT INTERVAL: Later

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 2

EQUIPMENT ID: Limit Switches
(1)

MANUFACTURER: NAMCO

MODEL #: EA-170

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$5.6 \times 10^5 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: QTR-107 (MCM-1205.34-11), August 1978 Report (MCM-1205.34-03)

METHOD: Test

REPLACEMENT INTERVAL: 5 years

MDSS/MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 2

EQUIPMENT ID: Damper Limit Switches
(1)

MANUFACTURER: NAMCO

MODEL #: EA-180

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$8 \times 10^6 \text{ RAD}$

$2.0 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: QTR-106 (CNM-1205.19-42)

METHOD: Test

REPLACEMENT INTERVAL: 4 years

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 2

EQUIPMENT ID: Level Switches
(1) ND & NS Room Sump Level

MANUFACTURER: Magnetrol

MODEL #: A103F-3X-MPG

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2.6 \times 10^5 \text{ RAD}$

$1.0 \times 10^6 \text{ RAD}$

QUALIFICATION REPORT: Wyle Report #43235-1

METHOD: Test

REPLACEMENT INTERVAL: N/A

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Residual Heat Removal Pump
(1) Motors

MANUFACTURER: Westinghouse, Buffalo
(NSSS)

MODEL #: VSHX (TEWC)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.8 \times 10^6 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: WCAP 8754, Rev. 1 and Calculation MCC-1385.05-00-0102

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Centrifugal Charging Pump
(1) Motors

MANUFACTURER: Westinghouse, Buffalo
(NSSS)

MODEL #: LLD-TEWC

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$6.1 \times 10^5 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: WCAP 8754, Rev. 1 and Calculation MCC-1385.05-00-0102

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Fuel Pool Cooling Pump Motors
(1)

MANUFACTURER: Westinghouse, Buffalo

MODEL #: 73F69065 S/N 1&2
73F69066 S/N 1&2

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

5.3×10^3 RAD

2×10^8 RAD

QUALIFICATION REPORT: CNM-1318.00-0004; CNM-1318.00-0005

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 2

EQUIPMENT ID: Annulus Ventilation
(1) Fan Motors

MANUFACTURER: Joy/Reliance

MODEL #: 1XF-882739

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$8.0 \times 10^6 \text{ RAD}$

1.0×10^9

QUALIFICATION REPORT: NUC-9 (CNM-1211.00-1010); X-604(CNM-1211.00-1009)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Chilled Water Pump
(1) Motors

MANUFACTURER: Reliance

MODEL #: 1YF-882584
1YF-882766

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$4.9 \times 10^5 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: NUC-9 (CNM-1320.00-0003) and Radiation Qualification Report (CNC-1381.05-00-0055)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Control Room Air Handling
(1) Unit Fan Motors

MANUFACTURER: Reliance

MODEL #: 1YF-882986, 2YF-882986

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$5.6 \times 10^5 \text{RAD}$

$2 \times 10^8 \text{RAD}$

QUALIFICATION REPORT: NUC-9 (CNM-1320.00-0003) and Radiation Qualification Report (CNC-1381.05-00-0055)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Control Room Area Air
(1) Handling Unit Fan Motors

MANUFACTURER: Reliance

MODEL #: 1XF-882609, 2XF-882609
1YF-883344, 1YF-882760

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$4.1 \times 10^4 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: NUC-9 (CNM-1320.00-0003) and Radiation Qualification Report (CNC-1381.05-00-0055)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Fuel Handling Area Exhaust
(1) Fan Motors

MANUFACTURER: Joy/Reliance

MODEL #: 1YF-882585, 2YF882585
1YF-882745

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.4 \times 10^5 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: NUC-9 (CNM-1320.00-0003) and Radiation Qualification Report (CNC-1381.05-00-0055)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Auxiliary Building Filtered
(1) Exhaust Fan Motors

MANUFACTURER: Reliance

MODEL #: 1XF882610, 2XF882610
1XF882771

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.1 \times 10^6 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: NUC-9 (CNM-1320.00-0003) and Radiation Qualification Report (CNC-1381.05-00-0055)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Containment Spray and Residual MANUFACTURER: Reliance MODEL #: 1YF882456, 1YF882767
(1) Heat Removal Pump Room Sump
Pump Motors

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2.6 \times 10^5 \text{RAD}$

$2 \times 10^8 \text{RAD}$

QUALIFICATION REPORT: NUC-9 (CNM-1320.00-0003) and Radiation Qualification Report (CNC-1381.05-00-0055)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Switchgear Room Air Handling
(1) Unit Fan Motor

MANUFACTURER: Reliance

MODEL #: 1YF-882577, 2YF-882577
1YF-882758, 2YF-882758

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.0 \times 10^3 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: NUC-9 (CNM-1320.00-0003) and Radiation Qualification Report (CNC-1381.05-00-0055)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Containment Spray Pump
(1) Motors

MANUFACTURER: Westinghouse, Buffalo

MODEL #: 74F18671 S/N 1 & 2
74F18672 S/N 1 & 2

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.0 \times 10^5 \text{ RAD}$

$2.0 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: NUC-9 (CNM-1320.00-0003) and CNM-1318.00-0004; CNM-1318.00-0005

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSR

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 0

EQUIPMENT ID: Safety Injection Pump Motor
(1)

MANUFACTURER: Westinghouse
(NSSS)

MODEL #: LAC-TEWC

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.0 \times 10^6 \text{ RAD}$

$2.0 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: WCAP8754, Rev. 1 (CNM-1201.05-0424)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Valve Motor Operators
(1)

MANUFACTURER: Limitorque

MODEL #: SMB RH Motor Insulation

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2.8 \times 10^6 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: 600-376-A, September 1972 and 600-465, December 1975 (CNM-1205.19-0001)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 0

EQUIPMENT ID: Valve Motor Operators
(1)

MANUFACTURER: Limitorque

MODEL #: SMB B Motor Insulation

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2.8 \times 10^6 \text{ RAD}$

$2 \times 10^7 \text{ RAD}$

QUALIFICATION REPORT: B0003, May 1976 (CNM-1205.19-0001)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Valve Motor Operators
(1)

MANUFACTURER: Rotork

MODEL #: NA-1

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
2.8X10 ⁶ RAD	2X10 ⁸ RAD

QUALIFICATION REPORT: TR-116, October 1973 (CNM-1205.19)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Valve Motor Operators
(1)

MANUFACTURER: Rotork

MODEL #: NA-2 with NA-1
Switch Mechanism

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$4.2 \times 10^6 \text{ RAD}$

$3 \times 10^7 \text{ RAD}$

QUALIFICATION REPORT: N 14/2, May 1980 (CNM-1205.19-0019)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Valve Solenoid Operators
(1)

MANUFACTURER: Valcor

MODEL #: V70900-21-3

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
7.8X10 ⁶ RAD	2X10 ⁸ RAD

QUALIFICATION REPORT: QR-70900-21-1, Rev. A; QR-52600-515, Rev. B; MR-70905-21-3-1 (CNM-1210.04-253, 254 and MCM-1210.04-119)

METHOD: Test/Analysis

REPLACEMENT INTERVAL: 5 years

MPIC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Valve Solenoid Operators
(1)

MANUFACTURER: Valcor

MODEL #: V526

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2.8 \times 10^6 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: QR-52600-6042-1 (CNM-1205.08-0047)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MEQP

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 2

EQUIPMENT ID: 3-way Valve Solenoid Operators
(1)

MANUFACTURER: ASCO

MODEL #: NP8320A172E/V

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

1.1X10⁶RAD

2.0X10⁷RAD

QUALIFICATION REPORT: AQR-67368 Rev. 0 (CNM-1211.00-1780)

METHOD: Test

REPLACEMENT INTERVAL: See Appendix C of AQR-67368, Rev. 0

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 2

EQUIPMENT ID: Electro-Hydraulic Damper
(1) Operators

MANUFACTURER: ITT General Controls

MODEL #: NH-90 Series

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$8 \times 10^6 \text{ RAD}$

$1.0 \times 10^7 \text{ RAD}$

QUALIFICATION REPORT: 721.77.095 (CNM-1211.00-1182)

METHOD: Test

REPLACEMENT INTERVAL: 4.5 years

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable -
(1) Medium Voltage

MANUFACTURER: Okonite

MODEL #: EPR Insulation
(Procurement
Specs: CNS-1354.01-00-0001
& 0003)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

2X10⁶RAD

2X10⁸RAD

QUALIFICATION REPORT: G-3 (CNM-1354.00-0007)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable -
(1) Control

MANUFACTURER: Okonite

MODEL #: FR-EPR Insulation (Procurement
Specs: CNS-1354.02-00-0001
& 0002)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

2×10^6 RAD

2×10^8 RAD

QUALIFICATION REPORT: FN-1 (CNM-1354.00-0006)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable -
(1) Hookup wire

MANUFACTURER: Okonite

MODEL #: Tefzel
Insulation (Procurement
Spec: CNS-1354.04-00-0006)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2 \times 10^6 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: K-0-1 (CNM-1354.00-0004)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable -
(1) Control

MANUFACTURER: Brand-Rex

MODEL #: XLPE Insulation
(Procurement
Specs: CNS-1354.02-00-0001
& 0002)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2 \times 10^6 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: F-C5120-1 (CNM-1354.00-0023)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable -
(1) Coaxial

MANUFACTURER: Brand-Rex

MODEL #: XLPE Insulation
(Procurement
Spec: CNS-1354.04-00-0004)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2 \times 10^6 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: F-C5120-2 (CNM-1354.00-0021)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable -
(1) Hookup Wire

MANUFACTURER: Anaconda

MODEL #: FR-EPR Insulation
(Procurement
Spec: CNS-1354.04-00-0006)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2 \times 10^6 \text{ RAD}$

$2 \times 10^8 \text{ RAD}$

QUALIFICATION REPORT: Test Report F-C4836-4 (CNM-1354.00-0017)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable -
(1) Medium Voltage Power

MANUFACTURER: Anaconda

MODEL #: EPR Insulation
(Procurement
Specs: CNS-1354.01-00-0001
& 0003)

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
2X10 ⁶ RAD	2X10 ⁸ RAD

QUALIFICATION REPORT: F-C4350-3 (CNM-1354.00-0003)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable -
(1) Control

MANUFACTURER: Anaconda

MODEL #: FR-EPR Insulation
(Procurement
Specs: CNS-1354.02-00-0001
& 0002)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

2×10^6 RAD

2×10^8 RAD

QUALIFICATION REPORT: F-C4969-1 and 80282 (CNM-1354.00-0009)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable -
(1) Instrumentation and Control

MANUFACTURER: Anaconda

MODEL #: FR-EPR Insulation
(Procurement
Specs: CNS-1354.03-00-0001,
0002 & 0003)

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
2X10 ⁶ RAD	2X10 ⁸ RAD

QUALIFICATION REPORT: F-C4836-2 (CNM-1354.00-0020)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable -
(1) Low Voltage Power

MANUFACTURER: Anaconda

MODEL #: FR-EPR Insulation
(Procurement
Specs: CNS-1354.01-00-0001
& 0003)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

2×10^6 RAD

2×10^8 RAD

QUALIFICATION REPORT: F-C4350-2 (CNM-1354.00-0002)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Cable Termination Splice
(1) Material

MANUFACTURER: Raychem

MODEL #: WCSF-N

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
2X10 ⁶ RAD	2X10 ⁸ RAD

QUALIFICATION REPORT: F-C4033-3 and 71100 (CNM-1367.01-0002)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: Seal Material -
(1)

MANUFACTURER: 3M

MODEL #: Scotch Cast 9 Epoxy
(XR-5240)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

2×10^6 RAD

2×10^8 RAD

QUALIFICATION REPORT: 44390-1 (CNM-1364.00-0001)

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: NSR Filters/Electric Heater and MANUFACTURER: Indeco MODEL #: N/A
(1) Control Panels

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
1.0X10 ⁶ RAD	1.0X10 ⁶ RAD

QUALIFICATION REPORT: CCL No. A-447-82-01 (CNM-1211.00-1544)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 0

EQUIPMENT ID: NSR Filers/Electric Heater
(1)

MANUFACTURER: Indeeco

MODEL #: N/A

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

2.0×10^7 RAD

2.0×10^8 RAD

QUALIFICATION REPORT: A-447-82-01 (CNM-1211.00-1544)

METHOD: Test

REPLACEMENT INTERVAL: N/A

MHVC

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 2

EQUIPMENT ID: Control Room Area Chillers
(1) Auxiliary Power Panels

MANUFACTURER: Carrier

MODEL #: 19FA

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

5.6×10^5

1.0×10^6 RAD

QUALIFICATION REPORT: A-133-77 (CNM-1211.00-0071)

METHOD: Test

REPLACEMENT INTERVAL: See Section 5, Table 5.1 in Test Report A-133-77

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 2

EQUIPMENT ID: Control Room Area Chillers
(1)

MANUFACTURER: Carrier

MODEL #: 19FA

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$5.6 \times 10^5 \text{ RAD}$

$1.0 \times 10^6 \text{ RAD}$

QUALIFICATION REPORT: A-133-77 (CNM-1211.00-71)

METHOD: Test

REPLACEMENT INTERVAL: See Section 5, Table 5.1 in Test Report A-133-77

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 1

EQUIPMENT ID: Humistat/Auxiliary Bldg.
(1) Exhaust and CTMT Purge Isolation

MANUFACTURER: American Instrument

MODEL #: Humistat 15-3239
15-1219

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$3.0 \times 10^5 \text{ RAD}$

$1.0 \times 10^7 \text{ RAD}$

QUALIFICATION REPORT: Report No. RR-1A (CNM-1211.00-564)

METHOD: Analysis

REPLACEMENT INTERVAL: N/A

MDSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1EATC9

MANUFACTURER: Duke

MODEL #: N/A

(1)
(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.0 \times 10^4 \text{ RAD}$

$1.25 \times 10^4 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1EATC9A

MANUFACTURER: Duke

MODEL #: N/A

(1)
(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

1.2×10^4 RAD

Later

QUALIFICATION REPORT: Later

METHOD: Later

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1ELCP0112

MANUFACTURER: Duke

MODEL #: N/A

(1)
(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$5.0 \times 10^3 \text{ RAD}$

$1.25 \times 10^4 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1ELCP0113

MANUFACTURER: Duke

MODEL #: N/A

(1)

(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

< 1.25x10⁴Rad - Enclosure
is being shielded and final
dose will be calculated upon
completion of shield construction

1.25x10⁴Rad

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1ELMC0020

MANUFACTURER: Duke

MODEL #: N/A

(1)
(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$9.0 \times 10^3 \text{ RAD}$

$1.25 \times 10^4 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1ELMC0021

MANUFACTURER: Duke

MODEL #: N/A

(1)
(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

< 1.25×10^4 Rad - Enclosure is 1.25×10^4 Rad
being shielded and final dose
will be calculated upon
completion of shield construction

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1TBOX0015

MANUFACTURER: Duke

MODEL #: N/A

(1)

(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2.8 \times 10^6 \text{ RAD}$

$3.0 \times 10^7 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1TBOX0019

MANUFACTURER: Duke

MODEL #: N/A

(1)
(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$2.8 \times 10^6 \text{ RAD}$

$3.0 \times 10^7 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1TBOX0020

MANUFACTURER: Duke

MODEL #: N/A

(1)

(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$3.0 \times 10^6 \text{ RAD}$

$3.0 \times 10^7 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1TBOX0021

MANUFACTURER: Duke

MODEL #: N/A

(1)

(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$3.0 \times 10^6 \text{ RAD}$

$3.0 \times 10^7 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1TBOX0298

MANUFACTURER: Duke

MODEL #: N/A

(1)
(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$9.3 \times 10^5 \text{ RAD}$

$1.0 \times 10^6 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1TBOX0299

MANUFACTURER: Duke

MODEL #: N/A

(1)
(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$1.9 \times 10^5 \text{ RAD}$

$1.0 \times 10^6 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1180X0345

MANUFACTURER: Duke

MODEL #: N/A

(1)
(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$4.9 \times 10^5 \text{ RAD}$

$2.7 \times 10^6 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 3

EQUIPMENT ID: 1TBOX0346

MANUFACTURER: Duke

MODEL #: N/A

(1)

(3)

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$5.6 \times 10^5 \text{ RAD}$

$2.7 \times 10^6 \text{ RAD}$

QUALIFICATION REPORT: CNC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 0

EQUIPMENT ID: General Purpose Dry Type
(1) Transformers

MANUFACTURER: Square D Co.

MODEL #: "Watchdog"

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

5.6X10⁵RAD

1.11X10⁶RAD

QUALIFICATION REPORT: CNM-1308.03-16

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 0

EQUIPMENT ID: Motor Control Centers
(1)

MANUFACTURER: Nelson Electric Co. MODEL #: 1035U

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
7.3X10 ³ RAD	2X10 ⁵ RAD

QUALIFICATION REPORT: CNM-1314.01-268

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 0

EQUIPMENT ID: 4160 Volt Metal Clad
(1) Switchgear

MANUFACTURER: Brown-Boveri Electric

MODEL #: 5HK250

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
7.3X10 ³ RAD	1X10 ⁵ RAD

QUALIFICATION REPORT: CNM-1312.02-81

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 0

EQUIPMENT ID: 4160/600 Volt Load Center
(1) Transformers

MANUFACTURER: Westinghouse

MODEL #: ASL

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

$7.3 \times 10^3 \text{ RAD}$

$1 \times 10^4 \text{ RAD}$

QUALIFICATION REPORT: CNM-1312.06-57

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 0

EQUIPMENT ID: 600 Volt Load Centers
(1)

MANUFACTURER: Brown-Boveri Electric

MODEL #: K1600S, K2000S

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
7.3X10 ³ RAD	1X10 ⁵ RAD

QUALIFICATION REPORT: CNM-1312.06-58

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 0

EQUIPMENT ID: 125VDC and 120VAC Power
(1) Panelboards

MANUFACTURER: Nelson Electric Co.

MODEL #: 1035U

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
4.1X10 ⁴ RAD	1X10 ⁵ RAD

QUALIFICATION REPORT: CNM-1314.01-268

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Rev. 0

EQUIPMENT ID: 125VDC and 120VAC
(1) Distribution Centers

MANUFACTURER: Nelson Electric Co.

MODEL #: 1035U

RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)
7.3X10 ³ RAD	1X10 ⁵ RAD

QUALIFICATION REPORT: CNM-1314.01-268

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

EPSS

CATAWBA NUCLEAR STATION - UNITS 1 AND 2

ENVIRONMENTAL QUALIFICATION OF CLASS 1E
EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO
POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

Note 1

Class 1E equipment that is exposed to the post-LOCA recirculation radiation environment has been evaluated for proper radiation qualification and is included in this table if it is exposed to a total integrated dose equal to or greater than 1×10^3 RAD. A total integrated dose (i.e., forty year normal plus one year accident dose) of less than 1×10^3 RAD is considered negligible since no materials have been identified at Catawba that exhibit a significant aging mechanism when exposed to less than 1×10^3 RAD.

Note 2

The recirculation radiation environment consists of the forty year normal operating radiation dose plus the dose received from one year of post-LOCA reactor coolant recirculation. Equipment with Replacement Interval will experience less than the listed total Integrated Dose.

This attachment addresses Class 1E equipment located outside containment that is exposed to the post-LOCA recirculation radiation environment. Because this harsh radiation environment outside the containment results from an accident (LOCA) inside the containment, no other accident conditions are assumed to exist outside the containment. Therefore temperature, pressure, relative humidity, chemical spray and submergence outside containment are not applicable.

Note 3

The equipment listed is a NEMA 4 enclosure containing general application devices (i.e., relays, switches, terminal blocks, etc.). The qualified environment is dictated by the single limiting device contained in the enclosure. The enclosure and device qualification is documented in calculation CNC-1381.05-00-0054.