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VICE PRESIDENT
NUCLEAR PRODUCTION

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September 12, 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
Drcket Nos. 50-413 and 50-414

Dear Mr. Denton:

Attached are five (5) copies of Revision 5 to Duke Power Company's response to NUREG-0588 for the Catawba Nuclear Station. This revision incorporates the following:

1. New parameters in Attachment 3 due to a main steam line break in the Doghouse.
2. Deletion of page EL40117H/6, response to NRC EQ Audit Items (Area Terminal Cabinet 1EATC9A), as 1EATC9A component qualification is complete (page 60, Attachment 4).
3. Deletion of page 7, Attachment 2, due to the RCS (WR) Pressure transmitters relocation to a mild environment.

Revision 5 pages should be inserted in accordance with the attached instructions.

Very truly yours,

H.B. Tucker
Hal B. Tucker

ROS:s1b

Attachments

8409170203 840912
PDR ADOCK 05000413
P PDR

A048

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Mr. Harold R. Denton, Director
September 12, 1984
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cc: (w/attachment)
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Idaho Falls, Idaho 83401

(w/o attachments)
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Duke Power Company
Catawba Nuclear Station

Response to NUREG-0588
Revision 5 Instruction Sheet

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Deleted by Revision 5

ATTACHMENT 2

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

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22	3				
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24	3				
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27	2				
AN-1	3				
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*D - Deleted: It has been determined that this equipment is not in the scope of 10CFR50.49 due to plant/system design changes, relocation to a mild environment area, or review of function and failure mode with respect to the event causing the harsh environment.

ATTACHMENT 3

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

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8	4	40a	5	70	1
9	4	41	D	71	1
10	3	42	5	72	1
11	4	42a	5	73	1
12	D	43	5	74	1
13	4	43a	5	75	1
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34a	5	56	4		
		57	2		
		58	2		
		59	2		
		60	2		
		61	D		
		62	D		

*D - Deleted: It has been determined that this equipment is not in the scope of 10 CFR 50.59 due to plant/system design changes, relocation to a mild environment area, or review of function and failure mode with respect to the event causing the harsh environment.

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. 5

EQUIPMENT ID: Transmitter-
Aux. FW Flow
(Doghouse)

MANUFACTURER: Barton

MODEL #: 764
(Lot 7)

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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The Auxiliary Feedwater Flow transmitters are not required to mitigate the consequences of a main steam line break in the doghouse.

QUALIFICATION REPORT: N/A

METHOD: N/A

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 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: 325°F* Press: 8.85 psig RH: 100%	Temp: 340°F Press: 110 psig RH: 100%	5.63 min.	5.9 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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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EQUIPMENT ID: Feedwater Isolation Valve (Doghouse) 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: 300°F* Press: 8.85 psig RH: 100%	Temp: 340°F Press: 110 psig RH: 100%	2.57 min.	5.9 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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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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)
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The Limitorque Valve Motor Operators located in the Doghouse are not required for mitigation of the consequences of a MSLB in the Doghouse.

QUALIFICATION REPORT: N/A

METHOD:

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. 5

EQUIPMENT ID: Valve Motor Operators

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: 262°F RH: 100%	Temp: 340°F RH: 100%	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. 5

EQUIPMENT ID: Valve Motor Operators
 (Doghouse)

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: 300°F* Press: 8.85 psig RH: 100%	Temp: 340°F Press: 70 psig RH: 100%	3.77 min.	5.9 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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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 Rev. 5

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: 262°F RH: 100%	Temp: 340°F RH: 100%	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 Solenoid Operators
 (Doghouse)

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: 300°F* Press: 8.85 psig RH: 100%	Temp: 346°F Press: 87 psig RH: 100%	2.57 min.	6.0 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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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Rev. 5

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: 262°F RH: 100%	Temp: 346°F RH: 100%	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
 (Doghouse)

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: 325°F* Press: 8.85 psig RH: 100%	Temp: 385°F Press: 66 psig RH: 100%	5.63 min.	7.2 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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 -
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: 252°F RH: 100%	Temp: 385°F RH: 100%	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
 (Doghouse)

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: 325°F* Press: 8.85 psig RH: 100%	Temp: 346°F Press: 113 psig RH: 100%	5.63 min.	6.0 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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: 262°F RH: 100%	Temp: 346°F RH: 100%	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
 (Doghouse)

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: 325°F* Press: 8.85 psig RH: 100%	Temp: 385°F Press: 113 psig RH: 100%	5.63 min.	7.2 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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: 262°F RH: 100%	Temp: 385°F RH: 100%	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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 Rev. 5

EQUIPMENT ID: Cable - Instrumentation and Control (Doghouse) 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: 325°F* Press: 8.85 psig RH: 100%	Temp: 385°F Press: 66 psig RH: 100%	5.63 min.	7.2 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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

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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 Rev. 5

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: 262°F RH: 100%	Temp: 385°F RH: 100%	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
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Cable -
 Low Voltage Power
 (Doghouse)

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: 325°F* Press: 8.85 psig RH: 100%	Temp: 385°F Press: 113 psig RH: 100%	5.63 min.	7.2 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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

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 PIPE RUPTURE ENVIRONMENT

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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: 262°F RH: 100%	Temp: 265°F RH: 100%	Continuous	Continuous	N/A	N/A

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

METHOD: Test

REPLACEMENT INTERVAL: N/A

EPSS

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: Cable -
 Control
 (Doghouse)

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: 325°F* Press: 8.85 psig RH: 100%	Temp: 385°F Press: 113 psig RH: 100%	5.63 min.	7.2 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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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: 262°F RH: 100%	Temp: 385°F RH: 100%	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
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Cable -
 Coaxial
 (Doghouse)

MANUFACTURER: Bra d-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: 325°F* Press: 8.85 psig RH: 100%	Temp: 385°F Press: 113 psig RH: 100%	5.63 min.	7.2 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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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: 262°F RH: 100%	Temp: 385°F RH: 100%	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
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Cable -
 Instrumentation and Control
 (Doghouse)

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: 325°F* Press: 8.85 psig RH: 100%	Temp: 430°F Press: 15 psig RH: 100%	5.63 min.	7.4 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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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: 262°F RH: 100%	Temp: 430°F RH: 100%	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
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Cable -
 Medium Voltage
 (Doghouse)

MANUFACTURER: Okonite

MODEL #: EPR
 Insulation (Procurement
 Specs: CNS-1354.01-00-000
 & 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: 440°F Press: 8.85 psig RH: 100%	Temp: 455°F Press: 32 psig RH: 100%	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
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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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)
Temp: 262°F RH: 100%	Temp: 455°F RH: 100%	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
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Cable -
 Control
 (Doghouse)

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: 440°F Press: 8.85 psig RH: 100%	Temp: 455°F Press: 32 psig RH: 100%	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
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Cable -
 Hookup Wire
 (Doghouse)

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: 440°F Press: 8.85 psig RH: 100%	Temp: 455°F Press: 32, psig RH: 100%	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
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Cable Termination
 Splice Material
 (Doghouse)

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: 325°F* Press: 8.85 psig RH: 100%	Temp: 360°F Press: 70 psig RH: 100%	5.63 min.	6.3 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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

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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: 262°F RH: 100%	Temp: 360°F RH: 100%	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
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO PIPE RUPTURE ENVIRONMENT

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EQUIPMENT ID: Seal Material for Cable
 Entrance Fittings
 (Doghouse)

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: 325°F* Press: 8.85 psig RH: 100%	Temp: 350°F Press: 18 psig RH: 100%	5.63 min.	6.15 min.	N/A	N/A

*Doghouse environment at time safety function completed - Ref. CNC-1381.05-00-0156.

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

METHOD: Test/Analysis

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. 5

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: 262°F RH: 0%	Temp: 350°F RH: 100%	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

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

Note 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.

The pipe rupture environmental analysis for the Doghouse was conducted separately taking into consideration different sizes of main steam line breaks. The equipment summary sheet parameters are based on the "worse case" size break with respect to actuation time of the equipment and the time when the Doghouse temperature reaches the qualification temperature of the equipment. All equipment located in the Doghouse is identified under "Equipment ID".

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: For outside containment ruptures of piping systems operating at temperatures less than 200°F, area relative humidity is not a significant qualification parameter. This pipe rupture temperature precludes flashing of the liquid which could significantly increase area relative humidity. Additionally, evaporation of the liquid does not significantly increase area relative humidity due to the large open areas in which the pipe rupture occurs and the relative short duration of the pipe rupture.

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	4	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	4	47	1	RN-1	1
13	4	48	1		
14	2	49	1		
15	2	50	1		
16	4	51	1		
17	D	52	3		
18	4	53	1		
19	3	54	1		
20	1	55	1		
21	1	56	2		
22	D	57	2		
23	2	58	1		
24	3	59	3		
25	3	60	5		
26	3	61	3		
27	3	62	4		
28	3	63	D		
29	3	64	3		
29A	3	65	4		
30	3	66	3		
31	D	67	3		
32	1	68	3		
33	1	69	3		
34	1				
35	1				

*D - Deleted: It has been determined that this equipment is not in the scope of 10CFR50.49 due to plant/system design changes, relocation to a mild environment area, or review of function and failure mode with respect to the event causing the harsh environment.

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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EQUIPMENT ID: 1EATC9A
(1)
(3)

MANUFACTURER: Duke

MODEL #: N/A

RECIRCULATION
RADIATION
ENVIRONMENT
(TID) (2)

RADIATION
LEVEL TO WHICH
QUALIFIED
(TID)

1.2X10⁴RAD

1.24X10⁴RAD

QUALIFICATION REPORT: CnC-1381.05-00-0054

METHOD: Test/Analysis

REPLACEMENT INTERVAL: N/A

ECSE