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DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

USNRC REGION II
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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

June 12, 1979

TELEPHONE: AREA 704
373-4083

Mr. James P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, GA 30303

RE: RII:JPO
50-269
50-270
50-287

Dear Mr. O'Reilly:

With regard to your letter of February 8, 1979 which transmitted IE Bulletin 79-01, please find attached responses to the action items for Oconee Nuclear Station.

Very truly yours,

William O. Parker Jr.

William O. Parker, Jr.

by WAH

SRL/sch

Attachment

cc: NRC, Office of Inspection and Enforcement
Division of Reactor Operations Inspection
Washington, DC 20555

Director, Office of Nuclear Reactor Regulation

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OCONEE NUCLEAR STATION

Response to IE Bulletins 79-01 and 79-01A

In accordance with IE Circular 78-08 and IE Bulletin 79-01, Duke Power Company has conducted a review of the environmental qualification of Class IE equipment installed inside each Oconee containment which must function under postulated accident environmental conditions. The results of this review are summarized in Attachment I.

During the review, it was determined that one valve motor operator on Unit 2 and certain aluminum limit switch gear frames on Unit 1 and Unit 2 valve motor operators did not meet the environmental qualification requirements for in-containment service. In accordance with the reporting requirements of IE Bulletin 79-01, DOR was notified of the above findings on May 23, 1979, and a complete written report was filed with DOR on June 5, 1979. A copy of the written report to DOR is included as Attachment II.

It was also determined in this review that four equipment areas have incomplete qualification documentation available for review. These areas are 1) equipment terminations; 2) cable entrance seals; 3) personnel air lock electrical penetrations; and 4) hook-up wire for valve limit switches. In accordance with the provisions of IE Bulletin 79-01 regarding items for which complete documentation is not available for review, appropriate corrective measures are being implemented. Attachment III provides a summary of the four equipment areas described above including corrective measures, implementation schedule, and justification for continued operation.

A specific concern described in IE Bulletin 79-01 is the use of certain stem-mounted limit switches in safety-related, in-containment applications. Our review of the Class IE equipment confirms that there are no stem-mounted limit switches used in safety-related applications inside any of the three Oconee containments.

With regard to IE Bulletin 79-01A, ASCO solenoid valves are not presently used or planned for use in safety-related, in-containment applications at Oconee.

It has been and will continue to be Duke Power Company's policy to use only the highest quality equipment and components in safety-related applications. To this end, we are continuing our efforts to assure that proper documentation supporting the qualification of installed safety-related equipment is available for review.

ATTACHMENT 1

OCONEE NUCLEAR STATION
RESPONSE TO IE BULLETINS 79-01 AND 79-01A

EQUIPMENT DESCRIPTION	ACCIDENT ENVIRONMENT	QUALIFIED ENVIRONMENT	QUALIFICATION METHOD	DOCUMENTATION	COMMENTS
RC Outlet Temperature RTD-Rosemount 177GY	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^7$Rad Chemical Spray: Note 1	Temp: 300°F Press: 60 psig RH: 100% Radiation: $2X10^8$Rad Chemical Spray: N/A	Test	Duke Test Report TR 0004-00	This test data applies to the portion of the RTD that is exposed to the containment environment.
RC Pressure N/R Transmitter - Rosemount 1152GP	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^4$ Rad Chem. Spray: Note 1	Temp: 286°F Press: 65 psig RH: 100% Radiation: $5X10^6$Rad Chem. Spray: N/A	Test	Bailey Test Report BCCO QR4201-1152GPT and Rosemount Report 117415	
RC Pressure W/R Transmitter - Motorola 56 PH	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^4$ Rad Chem. Spray: Note 1	Temp: 305°F Press: 60 psig RH: 100% Radiation: $2.2X10^6$ Rad Chem. Spray: N/A	Test	B&W Test Report BAW-10003A Rev 4	
RC Flow Transmitter - Bailey BY	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^4$Rad Chem. Spray: Note 1	Temp: 305°F Press: 60 psig RH: 100% Radiation: $5X10^4$ Rad Chem. Spray: N/A	Test	B&W Test Report BAW-10003A Rev 4	
Power Range Neutron Detector - Westinghouse WL23636	Note 2	Temp: 212°F Press: 150 psig RH: 100% Radiation: $3X10^9$Rad Chem. Spray: N/A	Test and Analysis	B&W Test Report B&W 10003A, Rev 4 and B&W Analysis	
Cable Splices - Raychem WCSF-N Tubing	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^7$ Rad Chem Spray: Boric Acid Solution	Temp: 357°F Press: 70 psig RH: 100% Radiation: $2X10^8$Rad Chem Spray: Boric Acid Solution	Test	Raychem Test Report FIRL-F-C-4033-3	Refer to Attachment 11

OCONEE NUCLEAR STATION
RESPONSE TO IE BULLETINS 79-01 AND 79-01A

EQUIPMENT DESCRIPTION	ACCIDENT ENVIRONMENT	QUALIFIED ENVIRONMENT	QUALIFICATION METHOD	DOCUMENTATION	COMMENTS
Cable Entrance Seals - Scotchcast 9	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^7$Rad Chemical Spray: Boric Acid Solution	Temp: 300°F Press: 60 psig RH: 100% Radiation: $2X10^8$Rad Chemical Spray: Boric Acid Solution	Test	Duke Test Report TR 0004-00	Refer to Attachment III
Reactor Building Cooling Unit Motor - Joy/Reliance	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $1.7X10^6$Rad Chem. Spray: Boric Acid Solution	Temp: 300°F Press: 80 psig RH: 100% Radiation: $1X10^8$Rad Chem. Spray: Boric Acid Solution	Test and Analysis	DPC File OS-95E	
Rotork Valve Motor Operators - Type NAI	Temp: 286°F Press:53.9psig RH: 100% Radiation: $1X10^7$Rad Chem. Spray: Boric Acid Solution	Temp: 332°F Press: 90 psig RH: 100% Radiation: $2X10^8$Rad Chem. Spray: Boric Acid Solution	Test	Rotork Equipment Spec NAI(3/72)	
Limitorque Valve Motor Operators - SMB Series	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^5$Rad Chem. Spray: Boric Acid Solution	Temp: 329°F Press: 90 psig RH: 100% Radiation: $2.04X10^8$Rad Chem. Spray: Boric Acid Solution	Test	Limitorque Test Report 600198	
Electrical Penetrations: Viking - Normal Containment Penetration	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $5.88X10^5$ Rad Chem. Spray: Note 3	Temp: 300°F Press: 60 psig RH: 100% Radiation: $1X10^8$Rad Chem. Spray: N/A	Test and Analysis	Viking Test Reports: QTP-118 QTP-119 QTP-120 QTP-124	

OCONEE NUCLEAR STATION
RESPONSE TO IE BULLETINS 79-01 AND 79-01A

EQUIPMENT DESCRIPTION	ACCIDENT ENVIRONMENT	QUALIFIED ENVIRONMENT	QUALIFICATION METHOD	DOCUMENTATION	COMMENTS
Personnel Lock Penetration	. . . . .	. . . . . Refer to	Attachment III	, Page 3	. . . . .
Cable: Anaconda EP-Hypalon	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^7$ Rad Chem. Spray: Boric Acid Solution	Temp: 346°F Press: 113 psig RH: 100% Radiation: $2X10^8$Rad Chem. Spray: Boric Acid Solution	Test	Franklin Report F-C4350-5	
Anaconda EP-Neoprene	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^7$Rad Chem. Spray: Boric Acid Solution	Temp: 346° F Press: 113 psig RH: 100% Radiation: $2X10^8$Rad Chem. Spray: Boric Acid Solution	Test and Analysis	Franklin Report F-C4350-3 Anaconda letter dated 6/1/79	
CERRO Polyethylene - Neoprene	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^7$ Rad Chem. Spray: Boric Acid Solution	Temp: 298°F Press: 51 psig RH: 100% Radiation: $2X10^8$ Rad Chem. Spray: Boric Acid Solution	Test	Franklin Report F-C2750	
Kerite HT Kerite Insulation	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^7$Rad Chem. Spray: Boric Acid Solution	Temp: 340°F Press: 105 psig RH: 100% Radiation: $2X10^8$Rad Chem. Spray: Boric Acid Solution	Test	Kerite Test Report (Isomedix) No. I-R-775	

ATTACHMENT I

OCONEE NUCLEAR STATION
RESPONSE TO IE BULLETINS 79-01 AND 79-01A

EQUIPMENT DESCRIPTION	ACCIDENT ENVIRONMENT	QUALIFIED ENVIRONMENT	QUALIFICATION METHOD	DOCUMENTATION	COMMENTS
Okonite EPR/Neoprene	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^7$ Rad Chemical Spray: Boric Acid Solution	Temp: 302°F Press: 60 psig RH: 100% Radiation: $3.5X10^7$ Rad Chemical Spray: Boric Acid Solution	Test	Okonite Engineering Report 110E	
Okonite EPR/Neoprene	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^7$ Rad Chem. Spray: Boric Acid Solution	Temp: 324°F Press: 60 psig RH: 100% Radiation: $2X10^8$ Rad Chem. Spray: Boric Acid Solution	Test	Okonite Engineering Report 141	
Boston Insulated Wire - Bostrad 7 Insulation	Temp: 286°F Press: 53.9 psig RH: 100% Radiation: $3X10^7$ Rad Chemical Spray: Boric Acid Solution	Temp: 318°F Press: 90 psig RH: 100% Radiation: $2X10^8$ Rad Chemical Spray: Note 4	Test	BIW Test Report B901	
Valve Limit Switch Hook-up Wire	. . . . .	. . . Refer to Attachment III, Page 3		. . . . .	. . . . .

OCONEE NUCLEAR STATION
Response to IE Bulletins 79-01 and 79-01A

Notes:

1. These devices are required for short term trip functions only (i.e., within the first minute after an accident), and therefore would not be affected by chemical spray.

2. The power range detectors are not required for LOCA protection. These dectors are provided for protection against abnormal power excursions and are required to function within the first 15 seconds following an excursion. Therefore, because of the short-term actuating time and the protection afforded by the detector well, the power range detectors will not be exposed to a hostile environment prior to performing their protective function.

3. Electrical penetrations are shielded from chemical spray by junction boxes inside the containment.

4. This cable is shielded from chemical spray by galvanized steel interlocked armor.

DUKE POWER COMPANY
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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

June 5, 1979

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

Attention: Mr. R. W. Reid, Chief
Operating Reactors Branch #4

Re: Oconee Nuclear Station, Units 1 and 2
Docket Nos. 50-269 and 50-270

Dear Sir:

On May 23, 1979, your office was notified that certain components in use at Oconee Nuclear Station Units 1 and 2 did not meet environmental qualification requirements. Pursuant to IE Bulletin 79-01, this letter provides detailed information regarding those components.

At approximately 1700 on May 22, 1979, as a result of a review of equipment qualification data for Oconee Nuclear Station, the Babcock and Wilcox Company (B&W) notified Duke Power Company that the operator for valve 2HP-20, the Engineered Safeguards (ES) Reactor Coolant Pump (RCP) Seal Return Isolation Valve inside the Unit 2 containment building, did not meet environmental qualification requirements. In addition, B&W indicated that eight in-containment ES isolation valves in Unit 1 and six in Unit 2 (including valve 2HP-20) were suspected of having operators with limit switch frame housings which were not qualified for a post-accident environment. At the time, Unit 1 was operating at 100% full power, and Unit 2 was in a heatup mode at approximately 500°F and 1750 psig. The decision was made to return Unit 2 to cold shutdown in order to allow replacement of the operator for valve 2HP-20, and cooldown was initiated at approximately 2100 on May 22. The valve operator, which was verified to have an aluminum limit switch housing, was replaced with a qualified operator. While Unit 2 was in cold shutdown on May 23, the five additional valves in question were inspected, and all five operators were found to have limit switches with aluminum housings. An evaluation was performed which concluded that the non-qualified limit switch housings would have no affect on safety in the event of a design-basis accident. Therefore, Unit 1 continued to operate, and Unit 2 returned to power operation following replacement of the operator for 2HP-20.

The non-qualified operator for valve 2HP-20 appears to have resulted from a construction deficiency at the time the valve was installed. The valve operator has been replaced with one which is qualified for a post-accident environment. The installation of the aluminum limit switch housings is considered to be due to a manufacturing deficiency. The limit switch housings for the valves listed below for Unit 1 will be inspected and replaced if necessary during the next cold shutdown of that unit. The aluminum limit switch housings for the valves listed for Unit 2 will be replaced at its next cold shutdown. In addition, the records for the replacement valve motor operator assemblies currently in storage will be reviewed to verify that their components meet environmental qualification requirements. The records for Unit 3 indicated that all ES valve operators in use in that unit meet the appropriate requirements.

Valve Number		
Unit 1	Unit 2	Function
1HP-3		Letdown Cooler A Isolation
1HP-4		Letdown Cooler B Isolation
1HP-20		Reactor Coolant Pump Seal Return Isolation
1LP-1	2LP-1	Normal Decay Heat Removal Isolation
1LP-2	2LP-2	Normal Decay Heat Removal Isolation
1GWD-12	2GWD-12	Quench Tank Vent Isolation
1CS-5	2CS-5	Quench Tank Suction Isolation
1CC-7	2CC-7	Component Cooling Water Return Isolation

If, upon receiving an ES signal, valve 2HP-20 had not closed due to failure of the non-qualified operator, isolation of the RCP seal return lines would have been effected by closure of redundant valve 2HP-21, located outside containment. In addition, periodic operability testing had confirmed that the valve will properly actuate upon receipt of an ES signal. The concern with respect to the aluminum limit switch housings resulted from tests conducted by the valves' manufacturer, which indicated that prolonged exposure to a boric acid spray, which could occur subsequent to a design-basis accident, could result in corrosion of the aluminum. However, the tests indicated that five hours of exposure to the corrosive spray was required before degradation of the housing affected operation of the limit switch, and the switch failed to operate properly only after 24 hours of exposure to the spray. Under postulated accident conditions requiring containment isolation, all the valves of concern would either be closed already or would close within 45 seconds, and would not be required to reopen. Therefore, the installation of the non-qualified valve operator components is considered to be of no consequence with respect to safe operation of the unit, and the health and safety of the public were not endangered.

Very truly yours,

W. O. Parker, Jr. by WAH

W. O. Parker, Jr.

SRL/sch

cc: Mr. J. P. O'Reilly

ATTACHMENT III

Oconee Nuclear Station
Response to IE Bulletins 79-01 and 79-01A

Summary of Items Having Incomplete
Documentation Available for Review

1. Equipment Terminations

The following three specific areas involving equipment terminations were identified as having incomplete qualification documentation available for review:

1. Protected terminal blocks used to terminate Bailey BY transmitters.
2. Power cable connections to the Reactor Building cooling fan motors.
3. Power cable connections to certain Limitorque valve motor operators.

The corrective measures for each item above involve changes in the termination methods as follows:

1. The Bailey BY transmitter terminal block connections will be replaced with direct in-line splices using materials having complete qualification documentation.

2. The existing taped power cable connections to the Reactor Building cooling fan motor leads will be replaced with direct in-line splices using materials having complete qualification documentation.

3. The existing taped power cable connections to certain Limitorque valve motor operators will be replaced with direct in-line splices or terminal blocks having complete qualification documentation.

The implementation schedule for the corrective measures described above is as follows:

Unit 1 - Next refueling outage (September, 1979)
Unit 2 - Next refueling outage (November, 1979)
Unit 3 - First cold shutdown after receipt of new equipment
(Equipment delivery expected September, 1979)

Continued operation of the Oconee units until the above corrective measures are implemented is justified based on the following:

1. All of the existing terminations described above are made in protective metal enclosures which afford protection from the direct effects of the postulated accident environment.

2. The Bailey BY transmitters and Rosemount RTD's are only required for short-term trip functions (i.e., within the first minute following an accident).

3. The Reactor Building cooling fan motors, required for long-term containment cooling, would be available because of the special

taping arrangement provided for the protected bolted connection. The existing power cable connections to the fan motor leads are made by a bolted splice wrapped with special insulating tapes. The insulating tapes are applied to the bolted connection as follows:

> Two inner layers of 1/2 lapped Bishop Pep W-962 self-bonding tape covered with two outer layers of 1/2 lapped Bishop No. 20 Tri-Sil tape.

4. The Limitorque valves in question are all containment isolation valves that are either normally closed or required to close in the short term (approximately 45 seconds) following a containment isolation signal. These valves would be available for their short-term containment isolation function because of the special taping arrangement provided for the protected bolted connection. The existing power cable connections to these Limitorque valve motor operators are made by a bolted splice wrapped with special insulating tape. The insulating tapes are applied to the bolted connections as follows:

> Two inner layers of 1/2 lapped Bishop Pep W-962 self-bonding tape covered with two outer layers of 1/2 lapped Bishop No. 20 Til-Sil tape.

In any instance, containment isolation would be assured by the redundant isolation valve located outside of the containment.

II. Cable Entrance Seals

Cable entrances into the Rosemount and Motorola transmitters and Rosemount RTD's are not sealed in such a manner to prevent the postulated accident environment (i.e. steam) from entering the device.

The corrective measure for these devices will be to seal the cable entrances with a qualified sealing material having complete qualification documentation.

The implementation schedule for the corrective measure described above is as follows:

Unit 1 - Next refueling outage (September, 1979)
Unit 2 - Next refueling outage (November, 1979)
Unit 3 - Completed

Continued operation of the Oconee units until the above corrective measure is implemented is justified based on the following:

> The Rosemount and Motorola transmitters and Rosemount RTD's are required for short-term functions only and would not be exposed to the full effects of the postulated accident environment prior to performing their functions.

ATTACHMENT III

III. Personnel Air Lock Electrical Penetrations

The electrical penetrations associated with the normal and emergency personnel air locks were determined to have incomplete qualification documentation available for review.

Each personnel air lock is equipped with two electrical penetrations, one on the Containment side of the air lock and one on the Auxiliary Building side. These penetrations are provided for lighting and communication in the air lock and for air lock door position indication.

The corrective measure for this item will replace the existing personnel air lock electrical penetrations with penetrations having complete qualification documentation. However, because of the long lead time required to procure qualified electrical penetrations, an interim measure will be implemented. This interim measure consists of removing all existing cables from the penetrations on the containment side of the air lock and installing testable metal flange seals on both ends of that penetration.

The schedule for implementing the interim measure described above is as follows:

Unit 1 - Next refueling outage (September, 1979)
Unit 2 - Next refueling outage (November, 1979)
Unit 3 - Completed

The permanent corrective measure (i.e.,installation of qualified electrical penetrations) will be scheduled for the first refueling outage following receipt of the new, qualified penetrations.

Continued operation of the Oconee units until the permanent corrective measures are implemented is justified based on the following:

1. Metal flange seals will be installed over the penetration between the air lock and the containment as an interim measure.

2. The existing air lock electrical penetrations have been successfully tested during the containment integrated leak rate test at a pressure equal to the design pressure of the Reactor Building.

3. Breach of the containment boundary would require the mechanical failure of two seals on both electrical penetrations associated with one air lock.

IV. Hook-up Wire for Valve Limit Switches

The hook-up wire used for valve limit switch logic (i.e., jumpers installed within a valve limit switch compartment) was determined to have incomplete documentation available for review.

The corrective measure for this item will be to replace the existing hook-up wire with wire having complete qualification documentation.

ATTACHMENT III

The implementation schedule for the corrective measure described above is as follows:

Unit 1 - Next refueling outage (September, 1979)
Unit 2 - Next refueling outage (November, 1979)
Unit 3 - Completed

Continued operation of the Oconee units until the corrective measure is implemented is justified based on the following:

1. The existing hook-up wire is protected from the direct effects of the postulated accident environment by the valve motor operator limit switch housing.

2. Based on manufacturer's data and Duke analyses, the limiting characteristic of the existing hook-up wire is radiation withstand capability.

   Calculations show that the dose rate postulated for the location of the Rotork motor operated valves results in the worst case expected radiation environment for the hook-up wire. This environment is based on the normal plus accident radiation dose.

   Based on the above conservative calculations, the accumulated dose to the hook-up wire at the time of scheduled replacement will be less than the manufacturer's radiation rating for the wire. Therefore, the existing wire is capable of performing its intended function until it is replaced.