TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

January 30, 1985

Director of Nuclear Reactor Regulation
Attention: Ms. E. Adensam, Chief
Licensing Branch No. 4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Ms. Adensam:

In the Matter of the Application of	)	Docket Nos. 50-390
Tennessee Valley Authority	)	50-391

Please refer to TVA's letter dated December 20, 1984 which provided, in part, a select update of the electrical equipment environmental qualification information submitted by letters dated July 24 and August 14, 1984. Enclosed are pages which were inadvertently omitted from either the July or December transmittal. This matter was discussed during a TVA/NRC conference call on January 11, 1985. Fifteen (15) copies of the enclosed information are provided.

If you have any questions concerning this matter, please get in touch with D. B. Ellis at FTS 858-2681.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

D. L. Lambert

D. L. Lambert
Nuclear Engineer

Sworn to and subscribed before me
this 30th day of Jan. 1985

Paulette N. White
Notary Public
My Commission Expires 8-24-88

Enclosure (15)
cc: U.S. Nuclear Regulatory Commission (Enclosure)
Region II
Attn: Mr. James P. O'Reilly Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

A048
3/15

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012265.03

WATTS BAR NUCLEAR PLANT - UNITS 1 AND 2
10CFR50.49 - EEEQR
SPECIAL INSTRUCTION SHEET
JANUARY 1985

The following is a set of instructions and a checklist for corrections to the WBN EEEQR as revised in October 1984. These changes do not constitute a revision but only correct errors which occurred during reproduction and compilation of the report.

Follow the instruction of the column headings in the order given to complete the changes.

	Remove	Insert	Add
1.	NEB-EQS Index	NEB EQS Index	
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6.	EEB-CB-1 App 1 (RO)		
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*Unit 2 EQSs are on file pending further evaluation.

EQUIPMENT QUALIFICATION

Summary

All of these valve operators are for use outside containment. They are qualified by a series of tests and by analysis and similarity arguments performed by the manufacturer. Analysis and similarity allow tests to be applied to different sizes of operators, to operators with design modifications unrelated to equipment qualification, and to various combinations of environmental conditions. References 3, 4, and 5 contain the manufacturer's verification that Limitorque report B0003 applies to all operators identified in Appendix 1 except for FCV-63-172, FCV-74-3, and FCV-74-21 which are covered by report 600456. Documentation for FCV-74-12 and FCV-74-24 has not been determined yet. R1 R1

Environmental Conditions

All Limitorque valve operators outside containment are qualified as one. The worst combination of environmental conditions, enveloping the conditions of each separate valve, are shown below. (For any one valve, this approach may be conservative, and there may be more margin than is claimed.)

	Normal	Accident	
Temperature (F)	115(1)	216	
Pressure (psia)	Atm	16.0	
Relative humidity (%)	90(1)	100	
Radiation (rad)	1×10^6 (40 yr)	1×10^7	R1

(1) Effective less than 1% of life.

Qualification

a. Documentation and General Qualification

Reference 1, report B0058, compiles applicable test reports in its appendices. It provides an overview of the design and test programs and shows how the several independent tests are mutually supportive, by supplementing the test reports with separate-effects and partial-type-test data, by adding information about design practices, and by analysis and similarity arguments. Appendix D, which is also known as report B0003, is a key part of this process, being a reasonably complete type test consistent with NUREG-0588. In the discussion which follows, B0003 will be used as the primary source of data. R1 R1

Preparer/Date T. W. Shoene, November 23, 1982 BTN 6/2/83, R1

Reviewer/Date Felicia A. Plesic, December 2, 1981 RAW 6/4/83, R1

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However, the balance of report B0058 also provides assurance of design adequacy to the extent that it demonstrates additional design, testing, and operating experience.

A detailed review of all the above information has been made. This information is judged to be adequate to fully qualify the operators. | R1

b. Test Temperature, Pressure, and Humidity

The reference 1 (B0003) environmental test was at 250°F for 24 hours and at over 200°F for 15 days more, not including an initial transient cycle. The maximum accident temperature persists for only 15 minutes and declines to normal in 24 hours. These tests were performed at saturated pressures corresponding to those temperatures (25 to 10 psig) and 100-percent relative humidity. Hence, the test conditions are extremely conservative. | R1

c. Radiation

The test irradiation level of 2×10^7 rads is in excess of the combined normal 40-year dose of 1×10^6 and the accident dose of 1×10^7 rads.

d. Aging

Thermal aging was performed at 165°F (73.9°C) for 200 hours. Reference 1 also points out that the test motor was kept at over 97°C for 144 hours during mechanical cycling (which is taken to mean the temperature at the critical location in the insulation during operation). To the extent that the number of mechanical cycles is in excess of design requirements, some credit could be taken for additional aging. Furthermore, the extra 15 days at 200°F (93.3°C), beyond the time required for the accident itself, could be credited to aging. However, the most optimistic, non-conservative use of these conditions would lead to only 700 days of aging at an equivalent temperature of 115°F, using the 10°C rule. Even disregarding the 115°F ambient, which is after all only present 1 percent of the time, aging would not equal the 40 years plus 100 days (40-year design life plus 100 days postaccident) required at the normal maximum allowed continuous temperature of 104°F. | R1

Reference 1 B0058 introduces an Arrhenius analysis which shows that at 50°C the life of the limiting material, the class B insulation, is 3074 years. Limitorque concludes that "artificial

Preparer/Date T. W. Shoene, November 23, 1982 TWS 6/2/83, R1

Reviewer/Date Felicia A. Plesic, December 2, 1981 FAP 6/4/83, R1

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life aging of Limitorque class B motors for purposes of environmental qualification would be unnecessary." In addendum A to report B0003 (reference 2), the appropriateness of this approach is discussed and additional information is presented. For example, the fact that the insulation is the life-limiting material is established by noting that "thermal aging of the terminal blocks, switches, and seals was deemed unnecessary since they are rated for over 180°F ambient continuous." Wiring, lubricant, and other materials are also discussed. R1

The data and arguments discussed above are generally accepted. They are consistent with common design practice, which by NEMA standards permits hot-spot temperatures of 120 to 130°C for class B motors operating continuously. The Limitorque operators are normally not operating, hence the capability for operation at 120-130°C indicates long-term capability to just stand by at 40°C or less. R1

Mechanical aging (over 2000 cycles) and seismic testing were performed in addition to thermal aging discussed above.

e. Components Tested to Report 600456 (Appendix C of Reference 1)

As mentioned above FCV-63-172, FCV-74-3, and FCV-74-21 were tested to report 600456 which is a test for operators with motors which have type RH insulation and are to be used inside containment.

The test parameters are as follows:

Temperature 300°F maximum
Pressure 70 lb/in^{2}g maximum
Humidity 100%
Radiation 2.04 x 10^{8}rads R1

All of the test parameters far exceed the required accident conditions since the test was intended for inside containment qualification.

The motor stator was thermally aged at 180°C for 100 hours. Limitorque's analysis in B0058 projects a qualified life of 135 years for the motor insulation.

Preparer/Date T. W. Shoene, November 23, 1982 6/2/83, R1

Reviewer/Date Felicia A. Plesic, December 2, 1981 6/4/83, R1

E43152.06

f. Test Methods

As previously indicated, reference 1 tests were not complete. Adequate thermal aging in the integrated type test was lacking. (However, the tests do seem consistent with standards and requirements existing at the time.) The analysis and similarity arguments used to supplement the testing while perhaps not the preferred method of qualification per NUREG-0588, seem to be base in sound engineering principles and supported by industry experience with these operators. R1

g. Qualified Life

A qualified life of 40 years is justified for these operators.

References

1. J. B. Drab, "Limitorque Valve Actuator Qualification for Nuclear Power Station Service," Limitorque Corporation, Report B0058, January 11, 1980 (NEB 820421 203).

2. J. B. Drab, "Addendum A Outside Containment Service B0003," October 6, 1978 (Revision C, November 15, 1979) (part of NEB 820421 203).

3. Limitorque letter to I. L. Beltz (TVA) dated December 11, 1981 (MEB 811215 508).

4. Limitorque letter to C. A. Chandley (TVA) dated January 8, 1982 (MEB 820111 583).

5. Limitorque letter to I. L. Beltz (TVA) dated June 1, 1982 (MEB 820604 547).

R1

Preparer/Date T. W. Shoene, November 23, 1982 6/2/83, R1

Reviewer/Date Felicia A. Plesic, December 2, 1981 6/4/83, R1

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	Revision 0	R1	R2	R3	R4
Preparer/Date	R. A. McStaffe 12-11-81	RAM 10-8-84			
Reviewer/Date	J. F. Wagner 12-14-81	JFW 10-8-84			

EQS No. EEB-CBL-17

TVA ID No:

Type-Special Cable

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

EFFECTIVE DATE OCT 1984

Manufacturer and Model Number See Table 3.11-8A, Sheet 1014

Verification of Table Information (Table 3.11-8A Sheet 1014)

X Equipment Type - The equipment has been identified as per TVA ID number designations (e.d., MOV, SOV, etc.).

X Location - The location has been identified (E.G., Inside Primary Containment, Annulus, Individually Cooled Rooms, General Spaces, or area affected by HELB outside primary containment).

X Component - A unique TVA ID number has been assigned (e.g., 1-FSV-68-308).

X Function - A functional description of the component has been given (e.g., Steam Generator Blowdown).

X Contract No., Manufacturer, and Model No. - The contract number, manufacturer, and model number has been given.

X Abnormal or Accident Environment - All abnormal or accident environmental conditions applicable to this equipment have been identified either in tables or by references to figures from tables.

X Environment to Which Qualified - The environment to which the equipment has been qualified is addressed in either the tables or the environmental analysis attached.

X Category - A category of a, b, c, or d has been defined for the equipment.

X Operation and Accuracy Required and Demonstrated - The operation and accuracy required and demonstrated have been defined.

Qualification Status (check if applicable, NA if not) Qualified Life 40 years

RI

X Qualification Report and Method - A qualification report and the method of qualification has been identified.

N/A Environmental Analysis - An environmental analysis has been done, attached to the EQS, and independently reviewed by the responsible organization.

RI

X Qualification by Similarity (If applicable) - A justification for qualification by similarity is attached to the EQS considering all the above factors and referenced to the appropriate tables.

X Qualification of Several Exact Components (If applicable) - When an EQS is used for more than one item, a list of all exact components are given as an appendix with all references to appropriate tables with justification for qualification considering all the above factors.

N/A Interim Qualification (If applicable) - (Open item) - Component has been determined to be qualified only for a limited interim operation, an NCR has been written, and plan of action has been determined to yield a qualified component. Term of Interim Qualification _____

NCR No. _____

N/A Unqualified Component-(Open item) - (If applicable) - Component has been determined to be unqualified; the following is attached to EQS: NCR number, reason for non-qualification, and justification of continued operation.

NCR No. _____

Prepared by: L. L. Mills 10-10-84

Reviewed by: J. L. Wagner 10-11-84

EEB-CBL-17
Appendix 1
Sheet 1 of 1
Revision 1

Special Cable (ETFE Family)

The ETFE family of cables consist of extruded ethylene tetrafluoroethylene (ETFE) fluoropolymer for the insulation material and an overall jacket material composed of either ETFE or polyvinyl chloride (PVC). The special cables used outside of containment at Watts Bar were furnished to TVA by Anaconda (contract 85838), Carolina Wire (826505), and Teledyne (825280). They are all insulated with TEFZEL, which is the E. I. Dupont Company's tradename for their ETFE fluoropolymer material. To fulfill the requirements of each contract, the vendors proved by test that the TEFZEL insulation on the cables being supplied met or exceeded specific physical and electrical requirements of MIL-W-22759/1b(AS). The tests showed that regardless of the manufacturer, TEFZEL-insulated cables are generically the same and can be expected to perform similarly in an accident environment.

TVA has approved test reports on file that demonstrate environmental qualification for TEFZEL-insulated cables for the following conditions:

a. Temperature: 450°F(1)
b. Pressure: 34 psig(1)
c. Humidity: 100%(1)
d. Radiation: 2×10^8 rads gamma(2)
e. Chemical Spray: 3000 ppm boron, pH 9.5-10.5(2)
f. Aging to prove a qualified life of 40 years

The worst case accident conditions which the cables could experience in their installed environments are as follows:

R1

a. Temperature: 220°F
b. Pressure: 30 psia
c. Humidity: 100%
d. Radiation: 1×10^8 rads
e. Chemical Spray: Not Applicable

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Based on the above, we conclude that the TEFZEL-insulated cables are qualified for use in their service environments for 40 years plus at least a year in their post-accident environments.

(1) Wyle Laboratories test report No. 46350-1, dated April 10, 1983, "Nuclear Environmental Qualification Test Program on Electrical Cables for Carolina Wire and Cable Company."

(2) Okonite Company test report No. K-0-1, dated September 1, 1979, "Qualification of OKOZEL Insulated Wire and Cable for Nuclear Plant Service."

	Revision					
Preparer/Date L.A. Webstuff 6-9-84						
Reviewer/Date J.J. Wagner 6-4-84						

Un[illegible]No. 1 and 2
EQS No. EEB-CSC-1
TVA ID No.
Conduit Seal Connectors

Rev 0

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. Conax Type ECSA

Verification of Table Information (Table 3.11-4, sheet 1001; 3.11-6, sheet 1000; 3.11-7, sheet 1000

NA Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).

X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).

NA Component - A unique TVA ID number has been assigned (such as, 1-FSV-68-308).

X Function - A functional description of the component has been given (such as, steam generator blowdown).

X Contract No., Manufacturer, and Model No. - The contract number, manufacturer, and model number have been given.

X Abnormal or Accident Environment - All abnormal or accident environmental conditions applicable to this equipment have been identified either in tables or by references to figures from tables.

X Environment to Which Qualified - The environment to which the equipment has been qualified is addressed in either the tables or the environmental analysis attached.

X Category - A category of a, b, c, or d has been defined for the equipment.

NA Operation and Accuracy Required and Demonstrated - The operation and accuracy required and demonstrated have been defined.

Qualification Status (check if applicable, NA if not)

Qualified Life (If equipment is qualified, indicate the qualified life with a numerical entry): 40 years

X Qualification Report and Method - A qualification report and the method of qualification has been identified on the Table Input Data Sheet (TIDS).

NA Environmental Analysis - An environmental analysis has been done, attached to the EQS, and independently reviewed by the responsible organization.

NA Qualification by Similarity (If applicable) - A justification for qualification by similarity is attached to the EQS considering all the above factors and referenced to the appropriate tables.

NA Qualification of Several Exact Components (If applicable) - When an EQS is used for more than one item, a list of all exact components is given as an appendix with all references to appropriate tables with justification for qualification considering all the above factors.

NA Interim Qualification (If applicable) - (Open item) - Component has been determined to be qualified only for a limited interim operation, an NCR has been written, and plan of action has been determined to yield a qualified component.

Term of Interim Qualification _____

NCR No. _____

NA Unqualified Component - (Open item) - (If applicable) - Component has been determined to be unqualified; the following is attached to EQS: NCR number, reason for non-qualification, and justification of continued operation.

NCR No. _____

EFFECTIVE DATE
JUL 1984

Preparer/Date R.L. Mills 11-7-84

Reviewer/Date J.F. Wagner 11-7-84

EEB-CSC-1
Appendix 1, Rev. 0
Sheet 1 of 1

Conduit Seal Connectors

Conax Type ECSA (Electrical Conductor Seal Assemblies)

These connectors are used as a moisture sealant in the electrical conduit system for certain Class 1E devices (such as limit switches, solenoid valves, level transmitters, RTDs, etc.) that are located in a harsh environment and subject to LOCA/HELB conditions. The connectors are made of solid, continuous copper conductors with polyimide insulation, polysulfone sealant, stainless steel tube, stainless steel ferrules and hex caps.

Data from references 6-12 which was obtained from tests conducted in accordance with references 1-5 prove qualification of the ECSAs for the following conditions:

Qualified life:	40 years at 125°C (Reference 12)
Radiation:	2.2×10^8 rads (gamma)
Temperature:	380°F/70 psig (LOCA)
	430°F/70 psig (MSLB)
Spray:	$H_3BO_3/NaOH/Na_2S_2O_3$ (pH 10)
Relative Humidity:	100%

R1

The above ratings envelope the environmental conditions in all areas of the plant. Qualification test results are documented under references 6-12 below.

References:

1. IEEE 323-1974
2. NRC Reg Guide 1.89
3. NUREG-0588, Rev 1
4. IEEE 344-1974
5. NRC Reg Guide 1.100, Rev 1
6. Conax Report IPS-409, Rev A
7. Conax Report IPS-409.1
8. Conax Report IPS-325, Rev D
9. Conax Report IPS-557
10. Conax Report IPS-798
11. Conax Report IPS-799
12. EN DES Calculation dated November 1, 1984 (EEB 841102 927).

R1

EFFECTIVE DATE OCT 1984

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Revision					
Preparer/Date H. D. Romanowski 7-13-84					
Reviewer/Date H Wagner 7/19/84					

UNIT NO. 1 and 2
EQ NO. EEB-PNL-1
TVA ID No. Heat Trace Distribution Panels

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. Thermon Manufacturing Company
Verification of Table Information (Table 3.11-6, Sheet 1014 and 3.11-7, Sheet 1011

X Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).

X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).

X Component - A unique TVA ID number has been assigned (such as, 1-FSV-68-308).

X Function - A functional description of the component has been given (such as, steam generator blowdown).

X Contract No., Manufacturer, and Model No. - The contract number, manufacturer, and model number have been given.

X Abnormal or Accident Environment - All abnormal or accident environmental conditions applicable to this equipment have been identified either in tables or by references to figures from tables.

X Environment to Which Qualified - The environment to which the equipment has been qualified is addressed in either the tables or the environmental analysis attached.

X Category - A category of a, b, c, or d has been defined for the equipment.

X Operation and Accuracy Required and Demonstrated - The operation and accuracy required and demonstrated have been defined.

Qualification Status (check if applicable, NA if not)

Qualified Life (If equipment is qualified, indicate the qualified life with a numerical entry): See Appendix 1

N/A Qualification Report and Method - A qualification report and the method of qualification has been identified on the Table Input Data Sheet (TIDS).

X Environmental Analysis - An environmental analysis has been done, attached to the EQS, and independently reviewed by the responsible organization.

N/A Qualification by Similarity (If applicable) - A justification for qualification by similarity is attached to the EQS considering all the above factors and referenced to the appropriate tables.

X Qualification of Several Exact Components (If applicable) - When an EQS is used for more than one item, a list of all exact components is given as an appendix with all references to appropriate tables with justification for qualification considering all the above factors.

N/A Interim Qualification (If applicable) - (Open item) - Component has been determined to be qualified only for a limited interim operation, an NCR has been written, and plan of action has been determined to yield a qualified component.
Term of Interim Qualification _____
NCR No. _____

N/A Unqualified Component - (Open item) - (If applicable) - Component has been determined to be unqualified; the following is attached to EQS: NCR number, reason for non-qualification, and justification of continued operation.
NCR No. _____

EFFECTIVE DATE JUL 1984

EFFECTIVE DATE JUL 1984

Preparer/Date: H. D. Romanowski /10-10-84

Reviewer/Date: J J Wagner 10/10/84

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Appendix 1 Rev. 0
Sheet 1 of 2

ELECTRICAL HEAT TRACE SYSTEMS
THERMON MANUFACTURING COMPANY
CONTRACT 77K6-821608

Distribution panels for the electrical heat trace systems feed associated circuits. The devices used for overload current protection on these circuits are Square D, type QOB circuit breakers.

Environmental qualification was not a requirement imposed on the manufacturer, and consequently no environmental qualification tests were run on the equipment. Thermon Manufacturing did, however, do a thermal aging test which subjected the breaker to 125°C (257°F) for 1360 hours. The breakers functioned as required after this test, which indicated the breakers would function at the peak temperature described below.

The panels are located in various areas of the plant and on a worst-case basis may be subjected for a maximum temperature of 197°F, 100 percent humidity, and a pressure of 14.3 psia for 650 seconds, and a total (40 year life and accident) radiation dose of less than $1x10^4$.

The safety function of the breaker is to remove the fault from a cable before the cable can catch on fire and jeopardize a safety-related cable. Whether the breaker trips and thus interrupts the fault or faults itself internally and thus moves the fault back from the cable does not matter. The thermal-magnetic circuit breaker always acts to protect the circuit under both high and low ambient environments.

Molded-case circuit breakers are composed of five main components: molded case (frame), operating mechanism, arc extinguishers and contacts, trip elements, and terminal connectors. The phenolic molded-case encloses the operating mechanism, arc extinguishers, contacts and trip elements and minimizes exposure to dirt, dust, and moisture. The operating mechanism is a metallic apparatus which is the means for opening and closing the breaker. The mechanism is spring-loaded which causes the contacts to snap open (or closed) when the breaker is tripped or manually operated. The trip elements serve to unlatch or "trip" the operating mechanism on occurrence of a prolonged overload or a short circuit. Molded-case breakers are constructed so that the contacts cannot be held closed against a fault condition ("trip-free condition").

On a breaker equipped with electro-mechanical type trip elements, overload protection is achieved by the use of a bimetal strip which bends or deflects when heated by excessive load current, physically causing unlatching of the operating mechanism. Elevated ambient temperature decreases the response time. Excessively high ambient temperature can cause degradation of internal insulating materials and affect breaker calibration. However, the design basis accident temperature is on the order of 197°F, which is well below this threshold.

EFFECTIVE DATE
OCT 1984

Protection against short-circuit current is achieved through the use of an electro-magnet in series with the load current. When a short circuit occurs the fault current passing through the breaker causes the magnet to attract the armature which in turn mechanically unlatches the operating mechanism causing instant opening of the contacts. The magnetic trip element is set to operate at a current level much lower than that which would cause cable damage in the short time before the breaker interrupts. The magnetic trip element is calibrated by varying the size of the air gap which proportionally varies the magnetic trip current rating.

The essential components of the tripping mechanism are metallic and thus nonthermally aging. Elevated temperature will not degrade operation of the magnetic trip element as it is sensitive only to fault current.

The panels are either a NEMA 4 or NEMA 12 enclosure with an internal thermostatically controlled heater to prevent condensation. Also the phenolic molded-case "enclosure" of the breaker minimizes the effect humidity has on the internal working parts of the breaker. Elevated levels of ambient humidity will have very little effect on the breaker when it is carrying load current because the temperature of the air surrounding the breaker will be higher than the room temperature and the surrounding air will be appreciably dryer than the room air. Even if moisture did condense, magnetic properties are not sensitive to moisture. If severe condensation occurred, it could cause a phase-to-phase fault and thus trip the main source breaker which is located in a mild environment, and even if the source breaker failed to trip, the fault would be moved away from the cable. It is extremely unlikely that moisture could cause conduction through the open contact and not cause a phase-to-phase or phase-to-ground fault, but if this did occur the arc would instantly evaporate the moisture. Also, the breaker contains no hygroscopic material which would be adversely affected by high humidity.

The radiation effect, which is less than 1×10^4 rads, is considered negligible since there are no known nonmetallic insulating materials adversely effected by this radiation level. See EPRI Report NP-1558 "Review of Equipment Aging Theory and Technology," Project 890-1, Final Report, Figure 7-18.

Therefore, the breakers in the heat trace distribution panels will "fail-safe" when exposed to the environmental conditions specified. Absence of effective aging mechanisms assures this capability for the life of the plant.

	Revision					
Preparer/Date W.C. Wyble 7/10/84						
Reviewer/Date D.R. Wolfe 7/11/84						

EQ No. EEB-BD-1
TVA ID No. 0-BD-228-1

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. Arrow-Hart
Verification of Table Information (Table Appendix 1)

X Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).
X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).
X Component - A unique TVA ID number has been assigned (such as, 1-FSV-68-308).
X Function - A functional description of the component has been given (such as, steam generator blowdown).
X Contract No., Manufacturer, and Model No. - The contract number, manufacturer, and model number have been given.
X Abnormal or Accident Environment - All abnormal or accident environmental conditions applicable to this equipment have been identified either in tables or by references to figures from tables.
X Environment to Which Qualified - The environment to which the equipment has been qualified is addressed in either the tables or the environmental analysis attached.
X Category - A category of a, b, c, or d has been defined for the equipment.
X Operation and Accuracy Required and Demonstrated - The operation and accuracy required and demonstrated have been defined.

Qualification Status (check if applicable, NA if not)

Qualified Life (If equipment is qualified, indicate the qualified life with a numerical entry): (See Appendix 1)
NA Qualification Report and Method - A qualification report and the method of qualification has been identified on the Table Input Data Sheet (TIDS).
X Environmental Analysis - An environmental analysis has been done, attached to the EQS, and independently reviewed by the responsible organization.
NA Qualification by Similarity (If applicable) - A justification for qualification by similarity is attached to the EQS considering all the above factors and referenced to the appropriate tables.
NA Qualification of Several Exact Components (If applicable) - When an EQS is used for more than one item, a list of all exact components is given as an appendix with all references to appropriate tables with justification for qualification considering all the above factors.
NA Interim Qualification (If applicable) - (Open item) - Component has been determined to be qualified only for a limited interim operation, an NCR has been written, and plan of action has been determined to yield a qualified component.
Term of Interim Qualification _____
NCR No. _____
NA Unqualified Component - (Open item) - (If applicable) - Component has been determined to be unqualified; the following is attached to EQS: NCR number, reason for non-qualification, and justification of continued operation.
NCR No. _____

	Revision					
Prepared/Date W. C. Wylie 7/10/84						
Reviewer/Date D. R. Webster 7/10/84						

Unit No. 1 & 2
EQS No. EEB-BD-2
TVA ID No. 0-BD-228-2

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. Arrow-Hart

Verification of Table Information (Table Appendix 1)

X Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).

X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).

X Component - A unique TVA ID number has been assigned (such as, 1-FSV-68-308).

X Function - A functional description of the component has been given (such as, steam generator blowdown).

X Contract No., Manufacturer, and Model No. - The contract number, manufacturer, and model number have been given.

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X Category - A category of a, b, c, or d has been defined for the equipment.

X Operation and Accuracy Required and Demonstrated - The operation and accuracy required and demonstrated have been defined.

Qualification Status (check if applicable, NA if not)

Qualified Life (If equipment is qualified, indicate the qualified life with a numerical entry): (See Appendix 1)

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Term of Interim Qualification _____

NCR No. _____

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NCR No. _____

Revision						
Preparer/Date W.C. Wyles 7/10/92						
Reviewer/Date D.R. Wilson 7/10/92						

Unit No. 1 & 2
EQS No. EEB-BD-3
TVA ID No.
0-BD-228-3

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. Arrow-Hart

Verification of Table Information (Table Appendix 1)

X Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).

X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).

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X Operation and Accuracy Required and Demonstrated - The operation and accuracy required and demonstrated have been defined.

Qualification Status (check if applicable, NA if not)

Qualified Life (If equipment is qualified, indicate the qualified life with a numerical entry): (See Appendix 1)

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Term of Interim Qualification _____
NCR No. _____

NA Unqualified Component - (Open item) - (If applicable) - Component has been determined to be unqualified; the following is attached to EQS: NCR number, reason for non-qualification, and justification of continued operation.
NCR No. _____

Revision						
Preparer/Date W.C. Wyles 7/10/84						
Reviewer/Date D.R. Wilson 7/9/84						

Unit No. 1 & 2
EQS No. EEB-BD-4
TVA ID No. 0-BD-228-4

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. Arrow-Hart

Verification of Table Information (Table Appendix 1)

X Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).

X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).

X Component - A unique TVA ID number has been assigned (such as, 1-FSV-68-308).

X Function - A functional description of the component has been given (such as, steam generator blowdown).

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X Operation and Accuracy Required and Demonstrated - The operation and accuracy required and demonstrated have been defined.

Qualification Status (check if applicable, NA if not)

Qualified Life (If equipment is qualified, indicate the qualified life with a numerical entry): (See Appendix 1)

NA Qualification Report and Method - A qualification report and the method of qualification has been identified on the Table Input Data Sheet (TIDS).

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Term of Interim Qualification _____

NCR No. _____

NA Unqualified Component - (Open item) - (If applicable) - Component has been determined to be unqualified; the following is attached to EQS: NCR number, reason for non-qualification, and justification of continued operation.

NCR No. _____

EFFECTIVE DATE

Revision	
Preparer/Date W. C. Wylie 2/10/84	
Reviewer/Date D. R. Webster 2/10/84	

EQ No. EEB-MC-1
TVA ID No. 0-MCC-217-A

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. I-T-E 5600 Series MCC
Verification of Table Information (Table Appendix 1)

X Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).

X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).

X Component - A unique TVA ID number has been assigned (such as, 1-FSV-68-308).

X Function - A functional description of the component has been given (such as, steam generator blowdown).

X Contract No., Manufacturer, and Model No. - The contract number, manufacturer, and model number have been given.

X Abnormal or Accident Environment - All abnormal or accident environmental conditions applicable to this equipment have been identified either in tables or by references to figures from tables.

X Environment to Which Qualified - The environment to which the equipment has been qualified is addressed in either the tables or the environmental analysis attached.

X Category - A category of a, b, c, or d has been defined for the equipment.

X Operation and Accuracy Required and Demonstrated - The operation and accuracy required and demonstrated have been defined.

Qualification Status (check if applicable, NA if not)

Qualified Life (If equipment is qualified, indicate the qualified life with a numerical entry): (See Appendix 1)

NA Qualification Report and Method - A qualification report and the method of qualification has been identified on the Table Input Data Sheet (TIDS).

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Term of Interim Qualification _____
NCR No. _____

NA Unqualified Component - (Open item) - (If applicable) - Component has been determined to be unqualified; the following is attached to EQS: NCR number, reason for non-qualification, and justification of continued operation.
NCR No. _____

	Revision					
Preparer/Date W.C. Wyatt 7/10/84						
Reviewer/Date D.R. Webster 7/10/84						

Unit No. 1 & 2
EQS No. EEB-MC-2
TVA ID No. 0-MCC-217-B

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. I-T-E Motor Control Center 5600 Series
Verification of Table Information (Table Appendix 1)

X Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).

X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).

X Component - A unique TVA ID number has been assigned (such as, 1-FSV-68-308).

X Function - A functional description of the component has been given (such as, steam generator blowdown).

X Contract No., Manufacturer, and Model No. - The contract number, manufacturer, and model number have been given.

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Qualification Status (check if applicable, NA if not)

Qualified Life (If equipment is qualified, indicate the qualified life with a numerical entry): (See Appendix 1)

NA Qualification Report and Method - A qualification report and the method of qualification has been identified on the Table Input Data Sheet (TIDS).

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Term of Interim Qualification _____
NCR No. _____

NA Unqualified Component - (Open item) - (If applicable) - Component has been determined to be unqualified; the following is attached to EQS: NCR number, reason for non-qualification, and justification of continued operation.
NCR No. _____

Preparer/Date W. E. Wyllie 7/4/84

Reviewer/Date D. R. Walter 7/4/84

Unit No. 1 & 2

EQS No. EEB-MC-3

TVA ID No. 0-MCC-216A

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. Gould I-T-E Motor Control Center 5600 Series

Verification of Table Information (Table Appendix 1)

X Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).

X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).

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Qualification Status (check if applicable, NA if not)

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Term of Interim Qualification _____

NCR No. _____

NA Unqualified Component - (Open item) - (If applicable) - Component has been determined to be unqualified; the following is attached to EQS: NCR number, reason for non-qualification, and justification of continued operation.

NCR No. _____

	Revision					
Preparer/Date	W. C. Wylie 7/10/82					
Reviewer/Date	D. R. Webster 7/11/82					

Unit No. 1 & 2
EQS No. EEB-MC-4
TVA ID No. 0-MCC-216B

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. Gould I-T-E Motor Control Center 5600 Series
Verification of Table Information (Table Appendix 1)

X Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).

X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).

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Term of Interim Qualification _____
NCR No. _____

NA Unqualified Component - (Open item) - (If applicable) - Component has been determined to be unqualified; the following is attached to EQS: NCR number, reason for non-qualification, and justification of continued operation.
NCR No. _____

	Revision					
Preparer/Date W.C. Wylie 7/10/84						
Reviewer/Date D.R. Webster 7/10/84						

Unit No. 1 & 2
EQS No. EEB-MC-5
TVA ID No. 0-MCC-208-A

WBN EQUIPMENT QUALIFICATION SHEET (EQS)

Manufacturer and Model No. Gould I-T-E Motor Control Centers
Verification of Table Information (Table Appendix 1)

X Equipment Type - The equipment has been identified as per TVA ID number designations (such as, MOV, SOV).

X Location - The location has been identified (such as, inside primary containment, annulus, individually cooled rooms, general spaces, or area affected by HELB outside primary containment).

X Component - A unique TVA ID number has been assigned (such as, 1-FSV-68-308).

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Qualification Status (check if applicable, NA if not)

Qualified Life (If equipment is qualified, indicate the qualified life with a numerical entry): (See Appendix 1)

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Term of Interim Qualification _____
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