DUKE POWER COMPANY

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August 17, 1981

TELEPHONE: AREA 704 373-4083

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

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

Re: McGuire Nuclear Station Docket Nos. 50-369, 50-370 Environmental Qualification of Equipment



Dea: Mr. Deaton:

The attached information is Duke Power Company's response to the "deficiencies" noted in the NRC Scaff "Safety Evaluation - Environmental Qualification of Safety-Related Electrical Equipment" as transmitted in SSER No. 5, Appen'ix D. This response addresses each of the items in the Safety Evaluation in a format similar to our NUREG-0588 response. This response includes the following tables:

- 1) Summary of Environmental Qualification of Class 15 Equipment Located inside Containment.
- 2) Summary of Environmental Qualification of Class IE Equipment Located outside Costainment and Exposed to the Post-LOCA Recirculation Radiation Environment.
- 3) Summary of Environmental Qualification of Class 1E Equipment Located outside Containment and Exposed to HELB Environment.

It should be noted that the "Inside Containment" table was previously submitted on July 15, 1981. This table is included in this submittal to add specific references on aging for each piece of equipment.

If you have any questions regarding this submittal or any previous sub-ittal on cavironmental qualification of Class 1E equipment, we would be happy to meet with you.

Very truly yours,

William O. Parker, Jr. Ry HAST

GAC/php Actachment B108240109 B10817 PDR ADOCK 05000369 PLY

Mr. Harold R. Denton, Director August 17, 1981 Page 2

cc: Ms. M. J. Graham Resident Inspector McGuire Nuclear Station Mir. James P. O'Reilly, Director . S. Nuclear Regulatory Commission Region II 101 Marietta Street, Suite 3100 Atlanta, Georgia 30303

McGuire Nuclear Station - Unit 1 Environmental Qualification of Class IF Equipment

NRC letters doced October 15, 1979 and February 15, 1980 concerning the environmental qualification of Class IE equipment defined the NRC Staf requirements with respect to NUREG 0588, interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment. Basically, the Staff's requirements were as follows:

- Provide a table listing by generic type all Class IE equipment including the appropriate qualification data for the equipment. The format for this table was provided in the Staff's October 15, 1979 letter.
- Review the adequacy of the environmental qualification for the equipment identified in Item 1 abc - with respect to the Staff's position described in NUREG 0508, document the degree of conformance, and justify any deviations.

Further, the NRC issued a Memorandum and Order on May 23, 1980 establishing NUREG 0588 as the requirement which applicants must meet in order to satisfy General Design Criterion 4 relating to the environmental qualification of Class IE equipment.

In response to the NRC Staff's requests for information in this matter, Duke Power Company has conducted a thorough review of the environmental qualification of Class 16 equipment located in a potentially harsh environment. A summary of the findings of this review was provided to the NRC Staff in submittals dated January 18, 1980, August 13, 1980, and October 14, 1960.

On April 17, 1981 the NRC Staff issued Supplement 5 to the McGuire Nuclear Station Unit 1 SER which contained the Staff's evaluation of the McGuire Unit 1 NUREG 0588 submittal. It is the purpose of this document to provide the additional information necessary to resolve the items identified by the Staff in both the SER text and in the grompanying tables.

SER Text - Paragraph 3.1

This paragraph of the SER addresses the completeness of the Class IE equipment qualification review from a systems standpoint. In this paragraph the Staff requested that the main steam isolation system be addressed or that proper justification be provided for not addressing the system. We have concluded that the Class IE components of the main steam isolation system were erroneously omitted from our NUREG 0588 submittal and that the qualification of these components will be addressed in the next revision to the submittal. The revision is scheduled for September 12, 1981.

SER Text - Para_ aph 3.2

This paragraph of the SER addresses the basis the service conditions identified in the NUREG 0588 submittal. In this paragraph the Scaff requested verification that the containment spray system is not subject to a disabling single - component failure. It has been verified that the McGuire Unit 1 containment spray system as described in the McGuire FSAR, Section 6.5 is not subject to a disabling single component failure.

SER Text - Paragraph 3.3

This paragraph of the SER addresses the temperature, pressure, and humifity conditions inside the containment resulting from a LOCA or MSLB. In this paragraph the Staff requested that the profile for the MSLB be extended from 1000 seconds to .0⁵ seconds. In a review of the MSLB scenario, it was determined that within 10 minutes into a MSLB event, all feedwater flow to the affected steam generator will be terminated. Following the blowdown and subsequent dryout of the affected steam generator, the containment temperature decreases rapidly due to the termination of steam release. After 20 minutes following a main steamline rupture, the containment temperature is less limiting than the temperature exhibited following a postulated rupture of the reactor coolant system. Therefore, it is not necessary to extend the MSLB profile to 10⁵ seconds.

In this paragraph the Staff also questioned the use of the LOCA temperature in the upper containment as the limiting temperature. The question is based on the fact that the hydrogen skinmer fans take suction from the lower containment and discharge in the upper containment following either a LOCA or MSL8. In a review of this concern it was determined that the discharge of the hydrogen skimmer fans into the upper containment will have no adverse effect on any Class IE equipment also located in the upper containment for the following reasons:

- The actuation of both the hydrogen skimmer fans and the containment air return fans is delayed 10 minutes from receipt of a containment high pressure signal. This means that the lower containment temperature will have already begun to decrease prior to initiation of these fans.
- 2. The actuation of the hydrogen skimmer fans is concurrent with the actuation of the containment air return fans; therefore, mixing provided by the containment air return fans will negate any potential temperature in the upper containment due to hydrogen skimmer fan discharge increase. This is evident from the capacities of the fans: hydrogen skimmer fans = 3,200 cfm; containment air return fans = 30,000 cfm.
- 3. The hydrogen skimmer fans are localed at elevation 820 which is approximately 50 feet above the operating check. There is no Class IE equipment located in the direct lischarge path of these fans.

SER Text - Paragraph 3.5

This paragraph of the SER addresses submergence. In this paragraph the Staff noted that the NUREG 0588 submittal identified certain safety-related motor operated valves including associated cables that are located below the maximum post-LOCA water level. The Staff requested that an assessment of the failure modes of these components be provided with consideration of the effects of their potential submergence on any other safety function including the potential of misleading information being supplied to the operator. The Staff further requested that this review consider operating time, across the spectrum of events, in relation to the time of submergence.

In a review of the safety-related motor operated valves located below the sarinum post-LOCA water level, it was determined that for all defined events the valve motor operators will perform their safety function prior to becoming submerged. The flood level will reach the lower most safety-related valves at approximately 5 minutes into an accident situation. These valves, however, will have moved to their safety position at approximately 15 seconds into an accident situation and are not required to reposition subsequent to submergence. This time interval provides adequate margin to assure the completion of the required safety function. Additional information concerning these valves is found in the McGuire FSAR, Section 15.4.1.3.

The aspect of misleading information being supplied to the operator is under review. Further information on this matter will be provided in an update to this report.

SER Text - Paragraph 3.6

This paragraph of the SER addresses chemical spray. In this paragraph the Staff requested additional information regarding the concentrations of the chemical sprays used in the various qualification programs. We have reviewed the qualification programs for the Class IE equipment located inside the containment and have provided the requested information as appropriate on the attached table.

SER Text - Paragraph 3.7

This parag aph of the SER addresses the aging of safety-related equipment. In this paragraph the Staff discusses the aging requirements for valve operators qualified in accordance with IEEE 382-1972 and continuous duty motors located inside containment qualified in accordance with IEEE 334-1971. The Staff also discusses the aging program for other safety-related equipment.

For the safity-related value operators (motor and solenoid) located inside containment, a review of the qualification documentation shows that these operators were mechanically, thermally, and radiation aged to an equivalent 40 year service life in accordance with IEEE 382-1972 prior to DBE testing. Additionally a review of the qualification documentation for safety-related

continuous duty motors installed inside the containment shows that these motors were mechanically, thermally, and radiation aged to an equivalent 40 year service life in accordance with IEEE 334-1971 prior to DBE testing. Maintenance schedules have been established for these valve operators and continuous duty motors that will assure that the 40 year life of the equipment is maintained

For other equipment, addressment of aging was no. a requirement in qualification programs committed to IEEE 323-1971 (i.e., Category II equipment). However, with the wealth of in-service experience covering a variety of equipment types, no significant in-service aging mechanisms have been identified which could prejudice the qualification tests performed on new equipment within a few years from start-up.

Duke Power Company is evaluating the in-containment Class 1E equipment and will report at the time of discovery any equipment for which significant aging mechanisms are identified including the justification for continued use and/or reasonable alternative action. This on-going investigation will necessarily be very time consuming and will rely heavily on EPRI research, NRC studies, NPRDS information, iE Bulletins and Circulars, and industry research and testing. Duke is an active member of the EPRI/Utility Advisory Group on Equipment Qualification and the AIF Subcommittee on Equipment Qualification and is participating in the current efforts to develop an industry position in regard to the aging issue.

In addition to the program described above, there are several on-going programs within Duke Power Company which address the surveillance, maintenance, and replacement aspects of SER Text - Paragraph 3.7 These programs are described below.

The Incident Investigation Program provides for the evaluation of equipment failures. As part of this program any components that may have degraded and caused equipment failure would be identified and appropriate corrective action taken. Identification of a component which degrades unacceptably over a period of time would result in either (1) replacement of the component with a better component or (2) establishment of a periodic replacement schedule for the component based on the length of time the original component functioned. In either of these two cases, the potential for future failures is diminished with a resultant increase in reliability and safety. Failures are also evaluated to determine whether any systematic trends exist. Additionally, the Maintenance Management Program presently under development will provide trend information on a wide variety of equipment problems. This is a computer based system with the capability to identify recurring equipment problems. As problems related to aging or degradation are identified similar corrective action to that metioned above can be taken.

SER Text - Paragraph 3.8

This paragraph of the SER addresses the basis for the calculated radiation doses both inside and outside the containment. In this paragraph the Staff questioned the radiation dose value range identified for inside the containment since certain values were below the Staff's screening criteria. A review of this situation indicates that the equipment which has a 40 year plus accident TID that is less than the Staff's screening criteria is only required for a shortterm function and is, therefore, not exposed to a high radiation dose prior to performing its safety function.

SER Text - Paragraph 3.9

This paragraph of the SER addresses margin. It should be noted that where margin has been identified as a potential deficiency for a given piece of equipment, it has been addressed on the attached tables.

SER Text - Paragraph 4

This paragraph of the SER addresses the Staff's assessment of the individual equipment items identified in Duke Power Company's NUREG 0588 submittal. The potential deficiencies identified by the Staff on a per equipment basis are addressed on the attached tables.

Page Revision

MCGUIRE INCLEAR STATION - UNIT 1 SURVARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 16 EQUIPHENT LOCATED INSIDE CONTAINNENT

EQUIP. LNT IDENTIFICATION (1)	HUNUFACTUREN	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONIENT (2)	ENVI ROMMENT TO MALCH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABIL'TY DENONSTR.".D	ACCURACY REQUIRED (X of Spen)	ACCUNACY DEMONSTRATED (X. OT Span)	QUALIFICATION REPORT AND NETHOD (4)
ransaltter - Pressurizer Pressure (Lover containment)	Barton	763 (Lot 2)	Temp: 327 F Press: 14.8 ps1g RN: 1/002 ps1g Sad: 2.5x10 ⁶ R Chem Spray: N/A	Temp: 380 F Press: 75 pal9 RH: 100% Rad: 5×107R Rad: 5×107R Chem Spray: Borlc acid and sodium hydroxide soin.	St iniclation (C5 min.)	5 minutes post 08E	¥01 •	Hax. Fror 7.76 (5 ato)	wcar saas wethod: Test

SER ITEM

- These transmitters are not exposed to any degradation from the effects of chemical spray prior to performing their safety function. CS:
- Additionally, Upon the completion of Barton LOT 4 tests, which include aging, our intent is to demonstrate Aging was not a requirement in the qualification program for the Barton (LOT2) transmitters, which was developed to address IEEE-323-1971. Radiation aging, however, has been adequately addressed by the LOT 2 testing program. E Bulletin 79-01B) that could affect the performance of the transmitters during the first two fuel cycles of The materials and components used do not have a known thermal aging mechanism (as compared to Appendix C of the similarity of the Barton LOT 4 and LOT 2 transmitters and thus obtain a proven qualified life. refer to the generic discussion of SER Text Paragraph 3.7, aging. reactor operation. A:
- The qualification tests demonstrate that the trip accuracy requirement is maintained for up to five (5) minutes generated, it is "locked-in" by the protective system and will not reset regardless of the transmitter's subseat least four (4) months post-accident within a relaxed accuracy requirement which provides additional margin quent performance. The qualification program also verifies that the transmitters will continue to operate for and probably much low r although that was not the intent of the program. Once the protection signal is for the five-minute trip requirement. ÷W

SQUIPHENT IDENTIFICATION (1)	HANUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCODENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOD (4)
Transmitter - Pressurizer Level (Lower containment)	Berton	764 (Lot 2)	Temp: 327 F Press: 14.8 pslg RH: 100% °ad: 1.4x10 ⁷ R Cher Spray: Borlc acid and sodium tetraborate soln.	Temp: 380 F Press: 75 pslg RH: 1002 Rad: 5x107R Chem Spray: Borlc Geod and sodlum hydroxide soln.	2 weeks post DBE	4 months post OBE	1 25%	Max, Ecror 152	WCAP 9885 hethod: Test

SER ITEM

- CS: Initial Spray: 2000-2100 ppm Boron 4.0 - 4.7 pH Recirculated Spray: 1800-2200 ppm Boron 6.0 - 10.0 pH
 - Test Spray: As documented in WCAP-9885, the chemical spray consisted of 2750 ppm boric acid dissolved in water and adjusted to a pH of 8.5 by sodium hydroxide, which is representative of the range of pH values permitted in the long term.
- A: Aging was not a requirement in the qualification program for the Barton (LOT 2) transmitters, which was developed to address IEEE-323-1971. Radiation aging, however, has been adequately addressed by the LOT 2 testing program. The materials and components used do not have a known thermal aging mechanism (as compared to Appendix C of IE Bulletin 79-018) that could affect the performance of the transmitters during the first two fuel cycles of reactor operation. Upon the completion of Sarton LOT 4 tests, which include aging, our intent is to demonstrate the similarity of the Barton LOT 4 and LOT 2 transmitters and thus obtain a proven qualified life. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This deficiency was deleted per discussions with M. Slosson, NRC-EQB, 7-8-81.

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Revision

EQUIPHENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOD (4)
Transmitter - 5/G Level (NR) (Lower containment)	Barton	764 (Lot 2)	Temp: 327 F Press: 14.8 ps1g RH: 100% Rad: 2.3x107 Chem Spray: Boric acid and sodium tetraborate soin.	Temp: 380 F Press: 75 psig RH: 100% Rad: 5x10 ⁷ K Chem Spray: Boric acid and sodium hydroxide soin.	Reactor trip ((5 min.) Plus 4 months post DBE	4 months post DBE	Trip Function: + 5% (5 min) PAM Function: ± 25% (4 mo)		WEAP 9885 Method. Test

SER Item

- CS:
 Initial Spray:
 2000-2100 ppm Boron
 Recirculated Spray:
 1800-2200 ppm Boron

 4.0 4.7 pH
 6.0 10.0 pH
 - Test Spray: As documented in MCAP-9885, the chemical spray consisted of 2750 ppm boric acid dissolved in water and adjusted to a pH of 8.5 by sodium hydroxide, which is representative of the range of pH values permitted in the long term.
- A : Aging was not a requirement in the qualification program for the Barton (LOT 2) transmitters, which was developed to address IEEE-323-1971. Radiation aging, however, has been adequately addressed by the LOT 2 testing program. The materials and components used do not have a known thermal aging mechanism (as compared to Appendix C of IE Bulletin 79-01B) that could affect the performance of the transmitters during the first two fuel cycles of reactor operation. Upon the completion of Barton LOT 4 tests, which include aging, our intent is to demonstrate the similarity of the Barton LOT 4 and LOT 2 transmitters and thus obtain a proven qualified life. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M : The qualification tests demonstrate that the trip accuracy requirement is maintained for up to five (5) minutes and probably much longer although that was not the intent of the program. Once the protection signal is generated, it is "locked-in" by the protective system and will not reset regardless of the transmitter's subsequent performance. The qualification program also verifies that the transmitters will continue to operate for at least four (4) months post-accident within a relaxed accuracy requirement which provides additional margin for the five-minute trip requirement.

The qualification program utilized a 15-day test period simulating a four-month post-DBE invironment based on conservative aging procedures referenced in WCAP-9885. This conservative basis (0.5 ev in the Arrher as equation) ensures that ad muate margin exists.

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Revision

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO MAICH QUALIFIED	OPERABILITY PEQUIRED 3N ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (I of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOD (4)
RTD - RCS Temperature (NR) (Lower containment)	Rosemount	176 KF	Temp: 327 F Press: 14.8 ps1g RH: 160% Rad: 1X10 ⁸ R Chem Spray: N/A	Temp: 332 F Press: 66 psig RH: 100% Rad: 1x10 ⁸ R Chem Spray: Boric acid and sodium hydroxide soln.	Reactor Trip (< 5 min)	5 MIN POST SUB	± 0.2%	± 0.2%	WCAP 5157 and Duke letter Parker to Denton dated December 19, 1979 Method Tast/Analysis

SER ITEM

- CS: These RTD's are not exposed to any degradation from the effects of chemical spray prior to performing their safety function.
- A: Addressment of aging was not a requirement in qualification program for these RTD's which was developed to meet the requirements of IEEE-323-1971. Futhermore, in-service experience with the type of equipment supplied by Westinghouse shows that it is highly unlikely that a significant in-service mechanism exists which could prejudice the qualification tests performed by Westinghouse on new equipment. In addition, radiation aging has been adequately addressed by the Westinghouse test program. A marginal application of one material (ethylene propolene rubber) has been identified in Appendix C of iE Bulletin 79-01B. The RTD's will be replaced within 10 years unless it can be shown that the EPR is a non-critical material. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: based on the radiation test of I X 10⁸ gamma, the RTD's qualified life would be in excess of 40 years plus five minutes post-SLB. If the EPR is judged to be a critical material, the life would be limited to 10 years. The Rosemont RTD qualification test program utilized a 6-day test period simulating a 52-day post-DBE environment based on conservation aging procedures. This test documented by WCAP-9157 ensures that adequate margin exists.

EQUIPMENT IGENTIFICATION (1)	MANUFACTURER	NODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY ALMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOD (4)
NID - - "5 Temperature (WR) 	Rosemount	176 KS	Temp: 327 F Press: 14.8 ps1g RH: 100% Rad: IX10 Chem Spray: Borlc acid and sodium tetraborate soin.	Temp: 332 F Press: 66 psig RH: 10078 Rad: 1x10 ^R Chem Spray: Boric acid and sodium hydroxide soin.	2 weeks post DBE	2 weeks Fost Jubt	± 0.7%	2 0.21	WEAP 9157 and Duke letter Parker to Denton dates December 19, 1979 Method Comparison to nodel 176 KF Test/Analysis

SER Item

- CS: Initial Spray: 2000-2100 ppm Boron 4.0 - 4.7 pH Recirculated Spray: 1800-2200 ppm Boron 6.0 - 10.0 pH
 - Test Spray: The chemical spray solution consisted of 1.146 wt. % boric acid and 0.17 wt. % NaOH dissolved in H₂O which corresponds to a pH of 8.5 and is representative of the range of pH values permitted in the long term.
- A,M: Addressment of aging was not a requirement in qualification program for these RTD's which was developed to meet the requirements of IEEE 323-1971. Furthermore, in-service experience with the type of equipment supplied by Westinghouse shows that it is highly unlikely that a significant in-service mechanism exists which could prejudice the qualification tests performed by Westinghouse on new equipment within a few years from startup.

The materials used in this component have been compared with the list of components in Appendix C of IE Bulletin 70-01B and, based on this comparision, no significant degradation would occur during this time. Based on the new requirement to address source terms associated with contained accidents in the reactor coolant system and the test program dose of 1 x 10⁸ rads gamma, radiation aging effects have been adequately addressed for 13 effective full power months (1st fuel cycle), and 2 weeks post-DBE. These RTD's will be replaced during the first refueling outage. The qualification program utilized a 6-day test period simulating a 52-day post-DBE environment based on conservative aging procedures documented in WCAP-9157. This provides adequate margin for the time period discussed above. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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EQUIPHENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENT:FICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO MIICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOP (4)
Electric Hydrogen Recombiner (Upper containment)	¥ Sturtevant		Temp: 180 F Press: 14.8 polg RH: 100% Rad: 8.1X10 ⁷ R Chem Spray: Borlc acid and sodium tetraborate soln.	Temp: 309 F Press: 62 psig RH: 100% Rad: 2x10 ⁸ R Chem Spray: Boric acid and sodium hydroxide soin.	3 months post LOCA	l year post LOCA	N/A	N/A	WCAP 7820 and Supplements 1-4 WCAP 7709-L and Supplements 1-4 Hethod: Test

SER Item

cs.	Initial Spray:	2000-2100 ppm boron	Recirculated Spray:	1800-2200 ppm Boron
00.	iniciai spist.	4.0 - 4.7 pH		6.0 - 10.0 pH

Test Spray: WCAP 7709-L, Supplement 2 describes chemical spray testing conducted on the H₂ Recombiner. Several types of spray tests were conducted including one using 2500 ppm boron (boric acid) with NaOH added to give a pH of 10.0. To this spray, sodium tetraborate was also injected.

A : The metallic materials used in the H2 Recombiner are not known to be susceptible to significant degradation due to aging.

All electrical components furnished with the <u>W</u> electric recombiner which may be exposed to post-LOCA environments and which use electrical insulation were tested. The power cable, heater connector wire, heater elements, thermocouples and extension wire were subjected to thermal preaging of 80 heatup and cooldown cycles followed by six LOCA steam pressure and spray cycles. All of the above items plus the terminal blocks were subjected to a radiation exposure of 2×10^8 rads gamma followed by another LOCA test as described in <u>W</u>CAP 7709-L, Supplement 2.

Due to the fact that no significant degradation was observed following the thermal cycling, radiation exposure and LOCA cycle described in WCAP 7709-1 and Supplements 1-4, it is felt that the H₂ recombiner will provide adequate service for 40 years of normal operation plus 1 year post-LOCA. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

M : This deficiency was deleted per discussions with M. Slosson, NRC-EQB, 7-8-81.

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EQUIPHENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATE	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND NETHOD
Containment AL-							(1 of Span)	(% of Span)	(4)
Return Fan Notors (Upper containment)	Joy/Rellance	2XF-330081	Temp: 180 F Press: 14.8 ps1g RH: 1002 Rad: 7.6X107A Chem Spray: Borle acid and sodium tetraborate soin.	Temp: 330 F Press: 85 psig RH: 200% Rad: 1X10 ⁹ R Chem Spray: Borle acid and sodium hydroxide soln.	2 months post DBE	l year post D	N/A	N/A	lest Report EF-16282 and Supplemental Technical Paper 74-408 Test Report X-604 Test Report NUC-9 and Supplement 4/14/80 hethod: Test

SER ITEM

CS: Initial Spray: 2000-2100 ppm Boron 4.0 - 4.7 pk

Recirculated Spray: 1800-2200 ppm Boron 6.0 - 10.0 pH

Test Spray: 3000 ppm Boron, 10.5 pH

A: Safety-related continuous duty motors located inside containment have been mechanically, thermally, and radiation aged to an equivalent of 40 years of service in accordance with IEEE 334-1971. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

M: This deficiency was deleted per discussions with M. Slosson, NRC-EQB, 7-8-81.

Page / Revision

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO NHICH QUALIFICD	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	GPERABILITY DEMONSTRATED	ACCURACY REQUIRED (X of Span)	ACCURACY DEMONSTRATED (X of Span)	QUALIFICATION REPORT AND METHOD (4)
Bydragen Skimmer Fan Hotors (Uppy/ containment)	Joy/Rellance	1 YF-882315	Ter.p: 180 F Pr.ss: 14.8 ps1g RH: 100% Rad: 7.6K107R Chem Spray: Borlc acld and sodłum tetraborate soln.	Ap: 330 F Press: 85 psig RH: 100% Rad: 00°R Chem S: 20°R Chem S: 20°R	2 months post DBE	l year post DBE	N/A	n/A	Test Report F*-14282 and Suppleme 31 Technical paper 1A-4051 Test Report X-504 Test Report NUC-9 and Supplement 4/14/80 Hethod: Test

SER ITEM

 CS:
 Initial Spray:
 2000-2100 ppm Boron
 Recirculated Spray:
 1800-2200 ppm Boron

 4.0 - 4.7 pH
 6.0 - 10.0 pH

Test Spray: 3000 ppm Boron, 10.5 pH

A: Safety-related continuous duty motors located inside containment have been mechanically, thermally, and radiation aged to an equivalent of 40 years of service in accordance with 334-1971. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

M; This deficiency was deleted per discussions with M. Slosson, NRC-EQB, 7-8-81.

Page 8 Revision

EQUIPMENT IDENTIFICATION (1)	NANUFACTURER	MODEL OR IDENTIFICATION	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TC WIICH QUALIFIED	OPERABILITY REQUIEED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOD (4)
Valve Motor Operators (Lower containment)	Rotork	7 NA3, 11 NA1, 14 NA1, 16 NA1, 30 NA1, 40 NA1, 70 NA1, 90 NA1	Temp: 327 F Press: 14.8 ps1g RH: 100% End: 6.7X1078 Chem Spray: Borlc acid and sodium tetraborate solo.	Temp: 340 F Press: 75 psig NH: 1002 2ad: 2x108R Chem Spray: Borlc Acid and sodium hydroxide soin.	5 min (Motes 8 and 9)	30 days post 08f	h/A	n/A	Lest Reports NI1/4, December 1970 TR 116, October 1973 TR 222, June 1975 Tex ed. Text

SER ITEM

- QT, N: The actual qualification test duration is 30 days post-DBE which adequately exceeds the required operating time.
- A: Safety-related value operators located inside containment have been mechanically, thermally, and radiation aged to an equivalent of 40 years of service in accordance with IEEE 3⁸ '972. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

CS:	Initial Spray:	2000-2100 ppm Boron	Recirculated Spray:	1800-2200 ppm Boron
		4.0 - 4.7 pH		6.0 - 10.0 pH

Test Spray: 10,000 ppm Boric Acid, 7-9 pH

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Page 10 Revision

MCGUIRE NUCLEAR STATION - UNIT 1 STAMARY OF ENVIRONMENTAL QUALIFICATION 3" CLASS IE EQUIPMENT LOCATED INSIDE CONTAINMENT

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EQUIPMENT	MANUFACTURER	MODEL OR	ACCIDENT ENVIRONMENT (2)	ENVIRONNENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (X of Span)	ACCURACY DEMONSTRATED (% of spen)	REPORT AND METHOD (4)
Upper containment)	Linitorque	SHB	Temp: 180 F Priss: 14.8 ps1g RH: 100% Rad: 1.2x10 ⁸ R Chem Spray: Borle acld and sodium	Temp: 340 F Press: 105 ps1g RH: 1002 Rad: 2×103 Chem Spray: Borlc acld and sodium hydroxide soln.	5 min (Notes 8 and 9)	30 days post DBE	N/A	N/A	Limitorque Test Report: 80058 January 11, 1580 Method: Test

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QT, M: The actual qualification test duration is 30 days post-DBE which adequately exceeds the required operating

- Safety-related valve operators located inside containment have been mechanically, thermally, and radiation aged to an equivalent of 40 years of service in accordance with IEEE 382-1972. Additionally, refer to the A: generic discussion of SER Text Paragraph 3.7, Aging. 1800-2200 ppm Boron
- Recirculated Spray: initial Spray: 2000-2100 ppm Boron 6.0 - 10.0 pH CS: 4.0 - 4.7 pH

Test Spray: 3,000 ppm Boron, 10.5 pH

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHIEM QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Spen)	QUALIFICATION REPORT AND RETHOD (4)
Valve Solenold Operators (Lower containment)	Valcor	v526 v573	Temp: 327 F Press: 14.8 ps1g RH: 100% Rad: 7.5x107R Chem Spray: Boric acid and sodium tetraborate soin.	Temp: 346 F Press: 113 psł RH: 1002 Rad: 2x10 ⁸ R Ciem Spray: Borlc acld and sodłum hydroxide soln.	Operate upon receipt of e safety signal	31 døys post OBE	N/A	N/A	Test Reports Qk-52600-515 and QR-57300-5220-1-1 October 31, 1977 Hay 15, 1979 Method: Test

SER ITEM

- QT, M: The actual qualification test du tion is 31 days post-DBE which adequately exceeds the required operating time.
- A: Safety-related value operators located inside containment have been mechanically, thermally, and radiation aged to an equivalent of 40 years of service in accordance with IEEE 382-1972. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

CS:	Initial Spray:	2000-2100 ppm Boron	Recirculated Spray;	1800-2200 ppm Boron
		4.0 - 4.7 oH		6.0 - 10.0 pH

Test Spray: 1720 - 2200 ppm Boric Acid, 9.5 - 10.5 pH

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EQUIPMENT IDENTIFICATION (1)	HASUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPCRABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	SECURACY DEMONSTRATED (X of Spen)	QUALIFICATION REPORT AND METHOD (4)
Containment Air Return isolation Limper Notor (Upper containment)	Rotork	13NA21	Temp: 140 F Press: 14.8 ps1g RH: 100% Rad: 8.1X10 ⁵ R Chem Spray: Borlc acid and sodium tetraborate soln.	Temp: 340 F Press: 75 psig RH: 1007 Rad: 2x10 ⁸ R Chem Spray: Boric acid and sodium hydroxide soin.	5 mln (max) post DBE	30 days post DBE	N/A	N/A	Test Report N11/4 December 1970 Test Report TR116 October 1973 Method: Test

SER ITEM

CS:	Initial Spray:	2000-2100 ppm Bord	on Recirculated Spray:	1800-2200 ppm Boron
		4.0 - 4.7 pH		6.0 - 10.0 pH

Test Spray: 10,000 ppm Boric Acid, 7-9 pH

- A: Safety-related value operators located inside containment have been mechanically, thermally, and radiation aged to an equivalent of 40 years of service in accordance with IEEE 382-1972. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This deficiency was deleted per discussions with M. Slosson, NRC-EQB, 7-8-81.

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EQUIPMENT IDENTIFICATION (1)	MANUFACTOR	MODEL OR IDENTIFICATION HUMBER	ACCIDENT LNVIFONHENT (2)	ENVIRUNMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (X of Span)	ACCURACY DEMONSTRATED (X of Spin)	QUALIFICATION REPORT AND METHOD (4)
Valve Solenold Gyzrators (Lower containment)	Asco	NP8316E34E NP8316E36E	Temp: 327 F Press: 14.8 pslg RH: 100% Rad: 7.5x10 ⁷ R Chem Spray: N/A	Temp: 346 F Press: 110 psig RH: 1005 Rad: 11 % Chem Spray: Boric acid and sodium hydroxide soin,	Operate upon receipt of safety signal	30 days post DBE	N/A	N/A	lest Report AQS21678/IR Hethod: lest

SER Item

 CS:
 Initial Spray:
 2000-2100 ppm Boron
 Recirculated Spray:
 1800-2200 ppm Boron
 6.0 - 10.0 pH

QT,M: The actual qu ification test duration is 30 days post-DBE which adequately exceeds the required operating time.

A : Safety-related value operators located inside containment have been mechanically, thermally, and radiation aged to an equivalent of 40 years of service in accordance with IEEE 382-1972. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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Test _ ray: 3000 ppm Boron, 9.5 - 10.5 pH

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOD (4)
Valve Solenoid Operators (Lower containment)	Target Rock	77CC Model	Temp: 327 F Press: 14.8 ps1g RH: 100% Rad: 5.7X10 ⁷ R Chem Spray: Borle acid + -1 sodium tetrab. ate soln.	Temp: 385 F Press: 66 ps1g Rit: 100% Rad: 1.3×10 ⁸ R Chem Spray: Borlc ccid and hydrozime	(Note 10)	14 days post DBE	N/A	N/A	Test Report 2375, 9/26/79 Method: Test

SER CEM

4

CS: Initial Spray: 2000-2100 ppm Boron 4.0 - 4.7 pH Recirculated Spray: 1800-2200 ppm Boron 6.0 - 10.0 pH

Test Spray: 6200 ppm Boric Acid, 8.6 - 10 pH

- A: Safety-related value operators located inside containment have been mechanically, thermally, and radiation aged to an equivalent of 40 years of service in accordance with IEEE 382-1972. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: The Target Rock solenoid values are used in the reactor lead vent system to provide a path for removal of non-condensable gases. Core events leading to the generation of significant amounts of non-condensable gases occur early in the postulated accident sequences and are of short duration; therefore, these values are only required to operate within the first fow days of the accident. The need for venting non-condensable gases is not anticipated beyond the 14 day qualification of the values.

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EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURATE REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOD (4)
Differential Pres- sure Switch for Damper Control (upper containment)	Salan	7PS LADW	Temp: 140 F Press: 14.8 ps1g RH: 100% Rad: 8.1X10 ⁵ R Chem Spray: Boric acid and sodium retraborate soln.	7emp: 150 F Press: 15 pslg RH: 100% Rad: 2.1x10 ⁶ R Chem Spray: Borlc acid and sodium tetraborate soln.	l min post DBE	5 min post DBE	± 0.5 psig	ي ادم 3. ü	Test Report A293-80 Test Report A294-80 Method: Test

SER Item

CS: Initial Spray: 2000-2100 ppm Boron 4.0 - 4.7 pH Recirculated Spray: 1800-2200 ppm Boron 6.0 - 10.0 pH

Test Spray: 2000 - 4000 ppm Boron, 4.0 - 4.7 pH

- A : This pressure switch has been qualified for the 40 yea. normal life plus the accident environment. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M : Wichin the first sixty (60) seconds following an event requiring this switch to function, the switch will actuate permitting the containment isolation damper to open. At that time the differential pressure switch is electrically isolated from the control circuit and subsequent failure has no impact on safety.

EQUIPMENT IDENTIFICATION (1)	MANUFACTUREN	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRORMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCILENT ENVIRONMENT (3)	OPERABILITY DEMORSTRATED	ACCURACY REQUIRED (X of Spen)	ACCURACY DENCHSTRATED (X of Spx:)	QUALIFICATION REPORT AND PETHOD (4)
Electrical Penetrations (Lower containment)	0.G. O'arlen	Types A,B,C, D,E,F,G,H,J, K,L,M, and cathodic pro- tection pene- tration (Note 11)	Temp: 327 F Press: 14.8 psig RH: 100% Rad: 8.5X10 ⁷ R Chem Spray: Boric acid and sodium tetraborate soin. (Note 12)	Temp: 340 F Press: 15 psig RH: 100% Rad: 2x10°R Chem Spray: Boric acid and sodium hydroxide soin,	4 months post DBE	4 months post DBE	N/A	n/A	Test Reports ER-247, ER-252, and ER-227 Method: Test/Analysis

SER Items

QT, M, CS, A: These items will be resolved pending the completion of the test program outlined below:

These penetrations have been included in the NRC Qualification Verification Program. Recently there has been an interchange of information between Duke and NRC concerning a failure mechanism observed during testing conducted by Sandia Laboratories. In order to investigate the failure mechanism of the EPA (Electrical Penetration Assembly) test at Sandia and to verify the adequacy of the qualification of the connectors on the EPA's, Duke Power Company plans a two part program: First, a material data search will be made to obtain a more definitive understanding of the material characteristics of the connector sealing grownets which relate to the failure mechanism. Second, an environment 1 qualification test will be performed to repeat the test profile performed in the original qualification program by D. G. O'Brien. The test will include 1) individual components, thermally aged and irradiated, 2) various sizes of connectors, 3) a close simulation of the actual installation, 4) a variety of cable types actually used at the station.

The test sequence will include aging, irradiation and then the steam environment test with electrical tests in between. All circuits will be energized with their appropriate voltages and currents.

This program is expected to be complete by January 1982 with a report available shortly thereafter. A more detailed schedule will be provided as arrangements are made. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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EQUIPMENT IDENTIFICATION (1)	MANUFACTURES	HODEL OR IDENTIFICATION HUMBER	ACCISENT ENVIRONMENT (2)	ENVIRONHENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METIND (4)
Cable - Control, Instrumen- tation, and 2 KV power (Lower containment)	Okonite	EP Insulation	Temp: 327 F Press: 14.8 ps1g RH: 1007 Rad: 6.7X10 ⁷ R Chem Sprey: Bosic acid and sodium tetratorate soin.	Temp: 345 F Press: 104 psig RH: 100Z Rad: 2:10 ⁸ R Chem Sprsy: Boric acid and sodium hydroxida soin.	30 days post DBE	130 days post DBE	N/A	N/A	Test Reports FN-1, N-1, 6-3, 1101, and 141 Method: Test

SER Item

Recirculated Spray: 1800-2200 ppm Boron Initial Spray: 2000-2100 ppm Boren CS: 4.0 - 4.7 pH 6.0 - 10.0 pH

Test Spray: 3,000 ppm Boron, 10.5 pH

- A : This cable has been qualified for the 40 year normal life plus the accident environment. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M : This deficiency was deleted per discussion with M. Slosson, NRC-EQB, 7-8-81.

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EQUIPMENT IDENTIF: ATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVI RONNENT TO MHITS QUALIFELD	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (X of Span)	ACCURACY DEMONSTRATED (X of Span)	QUALIFICATION REPORT AND METHOD (4)
Cable - Sistrumentation (tower containment)	Okonite	Tefzel 280 Insulation	Temp: 327 F Press: 14.8 psig RH: 1007 Rad: 8.5X10 ⁷ R Chem Spray: Borlc acld and sodium tetraborate soln.	Temp: 341 F Press: 112 psig. RH: 100% Rad: 2x10 ⁸ R Chem Spray: Borlc acid and sodium hydroxide soin.	4 months post Duf	150 days	N/A	N/A	Test Report K-0-1 (September 1979) Method: Test

SER Item

- QT,M: Operability required is 120 days. Actual test time is 130 days. Margin is 10 days.
- A : This cable has been qualified for the 40 year normal life plus the accident environment. Additionally, refer to the generic discussion of SER Text caragraph 3.7, Aging.

CS : Initial Spray: 2000-2100 ppm Boron Recirculated Spray: 1806-2200 ppm Boron 4.0 - 4.7 pH 6.0 - 10.0 pH

Test Spray: 3,000 ppm Boro., 10.5 pH

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EQUIPMENT IDENTIFICATION (1)	HANUF ACTURED	HODEL OR IDLHTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONIENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	DEMONSTRATED	ACCURACY REQUIRED (X of Span)	ACCURACY DEMONSTRATED (X of Span)	QUALIFICATION REPORT AND REINOD (4)
Catta - Control and 2KV power (Lower containment)	Anaconda	EP Insulation and EP/Hypaton Insulation	Temp: 32/F Press: 14.8 ps19 RH: 1007, Rad: 9x107R Aad: 9x107R acid and sodium tetraborate soln,	Temp: 346 F Press: 113 psig RH: 1032 Rad: 2x108R Chem Spray: Boilc acid and sodium hydroxide soin.	3 months post DBE	4 months post BBE	N/N	N/N	lest Reports F-C4350-2 and F-C4350-3, and Supplement Method: Test

SER Item

CS: Initial Spray: 2000-2100 ppm Boron 4.0 - 4.7 pH

Recirculated Spray: 1800-2200 ppm Boron 6.0 - 10.0 pH

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Test Spray: 3,000 ppm Boron, 10.5 pH

- This cable has been qualified for the 40 year normal life plus the accident environment. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging. 4
- This deficiency was deleted per discussion with M. Slosson, NRC-EQB, 7-8-81. .. Σ

EC SPHENT IDENTIFICATION (1)	MANUFACTURER	MOREL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHIEM QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	UPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOD (4)
Cable - Control (Lower containment)	Brand Kex	8¥ insulation	Temp: 327 F Press: 14.8 ps1g 3H: 100Z Rad: 7.5x107R Chem Sprr, Barlc acld and ru8lum Letraborate soln.	Temp: 346 [°] F Press: 113 psig RH: 100% Rad: 2×10 ⁸ R Chem Spray: Borlc acid and sodium hydroxida soln.	30 days post DBF	3J days post DBE	N/A	R/A	Test Aepart F-C4113 Method; Test

SER Item

QT,M: The actual qualification test duration of 30 days post-DBE was performed at a higher steady state temperature than expected. inside containment. The operability time demonstrated, therefore, did not take credit for the additional qualification time which could be derived from proper Arrhenius Techniques.

CS	1	Initial S	pray:	2000-2100	ppm Boron	Recirculated	Spray:	1800-2200	ppm	Boron
				4.0 - 4.7	pH			6.0 - 10.0) pH	

A : This cable has been qualified for the 40 year normal life plus the accident environment. Additionally, refer to the gener'c discussion of SER Text Paragraph 3.7, Aging.

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EQUIPMENT IDENTIF ATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONHENT (2)	ENV; RONMENT TO WHICH QUALIFIED	OPERABILITY SEQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Spen)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION SEPORT AND ME (HOD (4)
Cable - Instrumentation (Lower containment)	Samuel Moore	EP/Hypalon Insulation	iemp: 32, F Press: 14,8 ps1g RH: 100% Rad: 7.5x10 ⁷ R Chem Spray: Borle acid and sodium tetraborate soin.	Temp. 340 F Press: 105 psig RH: 100% Rad: 2x10 ⁸ R Chem Spray: Boric acid and sodium hydroxide soin.	30 days post DBE	30 days post JBE	N/A	. N/A	Tust Report F-63683 Acthod: Test

SER Item

QT,M: The actual qualification test furation of 30 days post-DBE was performed at a higher steady state temperature than expected. The operability time demonstrated, therefore, did not take credit for the additional qualification time which could be derived from proper Arrhenius Techniques.

CS	:	Initial Spray:	2000-2100 ppm Bor	ron Recirculated S	pray: 1800-2200 ppm Boron
			4.0 - 4.7 pH		6.0 - 10.0 pH

Test Spray: 2,000 ppm Boron, pH 9-11

A : This cable has been qualified for the 40 year normal life plus the accident environment. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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EQUIPMENT IDENTIFICATION (1)	MANUFACTUREA	MOPEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	SHERABILITY DEMONSTRATED	ACCURACT REQUIRED (% of Spen)	ACEURACY DEMONSTRATED (% of Span)	QUALIFICATION RÉPORT AND MÉTHOO (4)
Cable Termination/ Splice Material (Lower - untainment)	Raychem	WCSF-N Sleaves and Breakouts	Temp: 327 F Press: 14.8 ps1g RH: 100% Rad: 8.5X10 ⁷ R Chem Spray: Borlc acli and sodium tetraborate soln.	Temp: 357 F Press: 70 psig RH: 100% Rad; 2x10 [®] R Chem Spray: Borlc aclid and sodium hydroxide soln.	4 months post DBE	4 months post DBE	N/A	N/A	Test Reports F-C4033-5 and 71100 Method: Test/Analysis

SER Item

QT,M: The actual qualification test duration of 113 days post-DBE was performed at a higher steady state temperature than expected inside containment. The operability time demonstrated, therefore, did not take credit for all the additional qualification time which could be derived from proper Arrhenius Techniques. Only 7 days were taken credit and not the full Arrhenius time potential.

CS	5	Initial Spray:	2000-2100 ppr 30ron	Recirculated Spray:	1800-2200 ppm Boron
			4.0 - 4.7 pH		6.0 - 10.0 pH

Test Spray: 3,000 ppm Boron, 10.5 pH

A : This material has been qualified for the 40 year normal life plus the accident environment. Additionally, refer to the generic discussion of SEK Text Firagraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED INSIDE CONTAINMENT

EQUIPMENT IDENTIFICAT: ON (1)	HANUFACTURER	MODEL OR IDENTI STION	ACCIDENT ENVIRONHENT (2)	ENVI RONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY SEMONSTRATED (% of Span)	QUALIFICATION REPORT AP9 METHOD (4)
Stem-Mountel Limit Switches (Lower Containment)	Nanco	EA 180 EA 740	Temp: 327 F Press: 14.8 ps1g RH: 100% Rad: 6.7×10 ⁷ R Chem Spray: Borlc acid and sodium tetraborate soln,	Temp: 340 F Press: 63 psly RH: 100% Rad: 2×108R Chem Spiny: Boric acid and sodium hydroxide soin.	5 min (r∞te 9)	30 days post 98E	N/A	N/A	Named Test Reports dated March 3. 1918 and February 20, 1978 Method: Test

SER !tem

QT,A: The actual qualification test duration is 30 days post-DBE which adequately exceeds the required operating time.

CS : Initial Spray: 2000-2100 ppm Boron Recirculated Spray: 1000-2200 ppm Boron 4.0 - 4.7 pH 6.0 - 10.0 pH

Test Spray 3,000 ppm Boron, 10.5 pH

A : The aging qualification for this limit switch is under review. Additionally, refer to the generic discussion of the SER Text Paragraph 3.7, Aging.

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EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	ACCIDENT ENVIRONMENT (2)	ENVIRONMENT TO UNICH QUALIFIED	OPEN-SILITY REQUIRED IN ACCIDENT ENVIRONMENT (3)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOD (4)
Sea) Material for Caule Entrance Fittings (Lower Containment)	зн	Scotch Cast 9 (XR-5240)	Temp: 327 F Press: 14.8 ps1g RH: 100% Rad: 6.7x107R Chem Spray: Boric actu and sodium tetraborate soln.	Temp: 340 F Press: 15 psig RH: 100% Rad: 2x10 ⁸ R Chem Spray: Boric acid And sodium hydroxide soin.	24 Hours	na drys post DBE	6.74	N/A	Test Report 44350-1 Rev. 4 Nethod: Test/Analysis

SER Item

QT,M: Operability required is 24 hours. Actual test time is 12 days. Margin is 11 days. The 24 hour operability time is adequate time for mitigation of the containment pressure transient and termination of containment spray.

CS	1	Initial Spray	: 2000-2100	ppm Boron	Recirculated Spray:	1800-2200 ppm Boron
			4.0 - 4.7	ph		6.0 - 10.0 pH

Test Spray: 4,000 ppm Boron, pH is not available

A : This material has been qualified for the 40 year normal life plus the accident environment. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

EQUIPMENT (DENTIFICATION (1)	HANUFACTURER	HODEL OP IDENTIFICATION NUMBER	ACC'DENT ENVIRONHENT (2)	ENVIROIMENT TO MHICH QUALIFIED	OPERABILITY REQUISED IN ACCIDENT SNVIRONMENT (3)	UPERABILITY DEHONSTRATED	ACCURACY REQJIRED (% of Span)	ACCURACY DEMONSTRATED (X of Span)	QUALIFICATION REPORT AND METHOD [4]
Containment Radiation Monitors-High Range (Lower Containment)	General Atomic	RD-23 ionization Chamber	Temp: 240 F Press: 14.8 psig RH: 100% Rad: 8x10 ⁷ R Chem Spray: Borts actd and sodium terraborate soln.	Teap: 315 f Press: 70 ps1g RH: 100% Rad: Note 17 Chem Spray: Borlc acld, sodtum thlo- sulfate and sodtum hydroxide	2 weeks post LOCA	18 days post LOCA	Note 20	ноте 20	Test Report i-254-960 dated May 1, 1981 Method: Test/Acalysis
Cable for Containment Radiation Monitors- High Range (Lower Containment)	Rockbestos	RSS-6-104	Temp: 240 F Press: 14.8 ps1g RH: 109% Rad: 8x10 ⁷ R Chem Sprey: Note 10	Temp: 315 f Press: 70 f>19 RH: 100% Rad: 2×10 R Chem Spray: Portc actd, sodtum tilo- sulfate and sodtum fydroxide	2 weeks post LOCA	395 days post LOCA	N/A	n/A	Test Report t-254-960 dated May 1, 1961 (Note 18) Method: Tesi

SER Item

NOTE: This equiment is being installed per NRC requirements stated in NURE, 0737.

Q1 : The test data for this equipment as noted above was received after the submittal of Duke's NUREG 0588 data.

CS : Initial Spray:	2000-2100 ppm Esron	Pecirculated Spray:	1800-2200 ppm Boron
	4.0 - 4.7 pH		6.0 - 10.0 pH

Test Spray: 3,000 ppm Boron, 10.5 pH (Radiation Monitor) The Rockbestos cable is installed in conduit and is therefore not exposed to a chemical spray environment.

A : This equipment has been qualified for 40 years normal life plus the accident environment. Additionally, refer to the generic discussion of the SER Text Paragraph 3.7, Aging.

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EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	NOUSE A	ACCIDENT ENVIRONMENT (2)	ENVIRONAENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN ACCIDENT ENVIROMENT (3)	OPERABIL! TY DEMONSTRATED	ACCURACY REQUIRED (% of Span)	ACCURACY DEMONSTRATED (% of Span)	QUALIFICATION REPORT AND METHOD (4)
Safety Valve Position Indication-Acoustic Monitors (Lower Containment)	TEC	914	Temp: 327 F Pross: 14.8 psig RH: 1007 Rad: 8 × 10°3 Chem Spray: Boric acid and sodium tetraborate soln.	Noto 19	2 weeks post DBE	Note 19	N/A	н/А	Note 19

SER Item .

07: This equipment is being installed per NRC requirements stated in NUREG 0737. Test results are expected by August, 1981.

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MCGUIRE NUCLEAR STATION - UNIT 1

ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT LOCATED INSIDE CONTAINMENT

Note 1

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

Note 2

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

Temperature (Upper Compartment): 180F peak; time history as shown in FSAR Figure 6.2.1-24 (Rev 36).

Temperature (Lower Compartment): 327F peak; time history as shown in FSAR Supplement 1, Q042.73, Figure 7 Revision 39.

Pressure (Upper and Lower Compartment): 14.8 psig peak; time history as shown in FSAR Figure 6.2.1-23 (Rev. 36).

Relative Humidity: 100%

Radiation. Total integrated radiation dose for the equipment location includes 40 year normal operating dose plus the appropriate accident dose (except for the narrow-range and wide-range RTD's).

Chemical Spray: Boric acid and sodium tetraborate spray resulting from mixing in the containment sump of borated water from the RWST and sodium tetraborate solution from ice bed melt.

Note 3

Equipment operability requirements in the containment accident environment are as identified in FSAR Table 3.11.1-1 (Rev. 25).

Note 4

Environmental Qualification test reports for the following equipment have previously been submitted to the NRC Staff:

- Transmitters-Barton (by Westinghouse)
- * RTD's-Rosemount (by Westinghouse)
- Electric Hydrogen Recombiner (by Westinghouse)
- · Containment for Return Fan Motors (by Duke)
- · Hydrogen Skimmer Fan Motors (by Duke)
- · Solenoid Operators-Valcor (by Duke)
- · Electric Penetrations (by Duke)
- · Cable Termination/Splice Mater.al (by Duke)
- · Stem-Mounted Limit Switches (by Duke)
- · Cable Entrance Seal Material (by Duke)

Note 5

A requirement for McGuire Unit 1 is to limit the positive error for the trip function of narrow-range steam generator level transmitters to +5%. The or final Lot 2 report noted an error of +7.3 %^b,^C,^e early in the steam test transient. Additional tests were performed on the same unit using water as the process medium instead of nitrogen ^{b,C,e}. This caused the temperature of the strain gage to track the temperature of the circuit board ^{b,C,e} more closely during the first minute and limited the positive error to less than 4 %^{b,C,e}. In other words, the temperature difference between the strain gage and the circuit board ^{b,C,e} has been reduced to a level compatible to McGuire Unit 1 functional requirements.

Note 6

Deleted

Note 7

veleted

Note 8

Five minutes is adequate time to assure containment isolation and the required repositioning of other safety-related valves.

Note 9

During the 30 days following a postulated accident, the containment temperature and pressure will approach normal; therefore, additional service can reasonably be expected from this equipment.
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Note 10

The Target Rock solenoid values are used in the reactor head vent system to provide a path for removal of non-condensable gases. Core events leading to the generation of significant amounts of non-condensable gases occur early in the postulated accident sequences and are of short duration; therefore, these values are only required to operate within the first few days of the accident. The need for venting non-condensable gases is not enticipated beyond the 14 day qualification of the values.

Note 11

Electric penetration types B,C,F,G and K are the only penetrations required to function electrically in the containment accident environment. All electric penetrations, however, are designed and qualified to maintain their mechanical integrity under normal and postulated accident environmental conditions.

Note 12

The McGuire electric penetrations are protected from direct spray inpingement by galvanized steel boxes.

Note 13

Deleted

Note 14

Deleted

Note 15

The radiation environment for this equipment is dependent on operating time in the accident environment. This information will be provided upon receipt and review of formal test reports by Duke Power Company.

Note 15

The cables for the containment radiation monitors (high range) which are located inside the containment are routed in conduit, and, therefore not exposed to chemical spray.

Note 17

The manufacturer's test report states that the detector assembly is constructed of metal and ceramic and is not affected by radiation.

Note 18

Subsequent testing by the manufacturer showed a failure of a sample of cable at a himer temperature.

Note 19

This equipment is being installed per NRC requirements stated in NUREG 0737. Qualification testing for this equipment is scheduled for completion in August, 1981. The results of this testing will be provided upon receipt and review of the formal report by Duke Power Company.

Note 20

This equipment is being installed per NPC requirements stated in NUREG 0737. Overal: system accuracy should be within a factor of 2 over the entire range as stated in Regulatory Guide 1.97, rev. 2%. The demonstrated accuracy is under review. MCGUIRE NUCLEAR STATION - UNIT 1 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST LOCA RECIRCULATION RADIATION ENVIRONMENT

HEGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	HANDFAC TURER	HODEL OR IDENTIFICATION MUNDER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Current/Voltage Alarm	Rochester instruments	ET1215	<1x10 ³ R (worst case)	-ste /	Note 1

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

NOTE: This component is not exposed to a harsh post-LOCA recirculation radiation environment (Refer to Note 1).

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H-GUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATES JUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	HANUFACTURER	HODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (110) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Fuse	Bussmann	FNA	1.6x10 ⁶ R (worst case)	Note ó	Note 6

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal use plus I year post LOCA dose) applicable to the Gregonent's locations.

SER ITEM

R, QM, A qualification test program to document the radiation withstand capability of this component is in progress.

- M, QT, A preliminary review of component's materials i licates that there are no materials susceptible to significant QI: radiation degradation. However, as noted above, a qualification test program is underway with completion scheduled for December, 1981. The results of this test will be documented in a revision to the NUREG 0588 submittal.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPHENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	RECIRLGLATOR RADIATION ENVIRONMENT (TID) (2)	RAGIASION LEVEL IG MILCH QUALIFIED (TID)	DUALIFICATION N TOT AND HETHOD
Fuse	Bussman i	ктк	< 1x10 ³ R (morst case)	Note i	Note i

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

NOTE: This component is not exposed to a harsh post-LOCA recirculation radiation environment (Refer to Note I).

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HCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION ANDIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCU ATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED [TID]	QUALIFICATION REPORT AND NETHOD
Fuse block	Bussmann	3/92	t.6x10 ⁶ R (worst case)	1×10 ¹⁰ R	Memo to File. MC-1362.03 duted July 9, 1981 Method: Analysis

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

R: The radiation qualification of this component is as shown in the table above.

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

QM: This component has been qualified by analysis of previous material tests.

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HCGUIRE NUC, AR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL DR I DEN TIF I CATION MUIBER	RECIRCULATION RADIATION Environment (TID) (2)	RADIATION LEVEL TO MAICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Fuse black	Bussmann	3839	≪1×10 ³ R (worst case)	No'e l	Note 1

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

NOTE: This component is not exposed to a harsh post-LOCA recirculation radiation environment (Refer to Note 1).

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McGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION MUMBER	RF RCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MITCH QUALIFIED (TID)	QUALIFICATION PSPORT AND NETHOD
Fuse block	Bussmann	4439	I.Ix10 ³ R (worst case)	tx10 ¹⁰ R	Hemo to file: MC-1362.03 dated July 9, 1981 Hethod: Analysig

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

R: The radiation qualification of this component is as shown in the table above.

A: Refer to the generic discussion of SER Text raragraph 3.7, Aging.

QM: This component has been qualifie by analysis of previous material tests.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED DUISIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPHENT IDENTIFICATION (1)	MANUFACTURER	HUDEL OR IDENTI*ICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MHICK QUALIFIED (1,0)	QUALIFICATION REPORT AND HETHOD
Fuse block	Bussimann	4575	Ix10 ⁶ r (worst case)	i>10 ¹⁰ R	Heao to File: PC-1362.03 dated July 9, 1981 Method: Analysis

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

R: The radiation qualification of this component is as shown in the table above.

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

QM: This component has been qualified by analysis of previous material tests.

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NCGUIRE HUCLEAR STATION - UNIT I SUMMARY OF ENVIRORMENTAL QUALIFICATION OF CLASS DE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	HANUFACTURER	HODEL OR IDENTIFICATION NUMBER	RECIACULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MIICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Indicating Light	Cutler-Hammer	£29	Sx10 ⁶ R (worst case)	Note 6	Note 6

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA dose) applicable to the component's locations.

SER ITEM

R, QM, A qualification test program to document the radiation withstand capability of this component is in progress.

M, QT, A preliminary review of component's materials indicates that there are no materials susceptible to significant

QI: radiation degradation. However, as noted above, a qualification test program is underway with completion scheduled for December, 1981. The results of this test will be documented in a revision to the NUREG 0588 submittal.

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UKIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OK I DEN TIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (x)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND HETHOD
optica' solator	E-riax	1750123	<1x103R (worst case)	Note I	Note 1

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

NOTE: This component is not excessed to a harsh post-LOCA recirculation radiation environment (Refer to Note 1).

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HCGUIRE NUCLEAR STATION - UNIT SUMMANY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RELIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICAT, ON NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	NADIATION LEVEL TO WHIP QUALIFIEL (TID)	QUALIFICATION REPORT AND HETHOD
Power Supply	Lambda	LCS	-<1x10 ³ R (worst case)	Note i	Note i

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

NOTE: This component is not expose to a harsh post-LOCA recirculation radiation environment (Refer to Note 1).

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MCSUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECTRCULATION PADIATION ENVIRONMENT

EQUIPHENT IDENTIFICATION (1)	MANUFACTURER	HOF 14 DES IDENT, ICE /ION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Relay	Cutler-Hanner	023	1x10 ⁶ 8 (worst case)	Note 6	Note 6

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA dose) applicable to the component's locations.

SER ITEM

R, Qt, A qualification test program to document the radiation withstand capability of this component is in progress.

M, QT, A preliminary review of component's materials indicates that there are no materials susceptible to sign ficant QI: radiation degradation. However, as noted above, a qualification test program is underway with completion

- scheduled for Decomber, 1981. The results of this test will be documented is a revision to the NUREG 0588 submittal.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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M-GUIRE NUCLEAN STATION - UNIT 1 VIRONHENTAL QUALIFICATION OF FLASS IE EQUIPHENT ND EXPOSED TO THE POST-LOCA RECIRCULATION ANDIATION E
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LOCATED OUTSIDE

QUALIFICATION REFORT AND HETHOD	Note 6
RADIATION LEVEL TO WHICH QUALIFIED (TID)	Note 6
RECINCULATION ADDIATION ENVIANNENT (TED) (2)	2.4x407R (worst case)
NO FLOREL ON ROLFICATION NUMBER	026
MANUFACTUREA Cut Ler - Hanner	
EQUIPHENT IDENTIFICATION (1) Relay	

The component listed above is a general application device.

depending on its specific design application, may be located in various areas of the Auxiliary Building. This table This component is installed in NEMA type enclosures and *he qualification of this component with respect to the worst-case radiation environment (40 year normal dose' applicable to the component's locations. dose plus 'year post LOCA

SER ITEM

R, QM, M, QT,

A preliminary review of component's materials indicates that there are no materials susceptible to significant A qualification test program to document the radiation withstand capability of this component is in progress. scheduled for December, 1981. The results of wis test will be documented in a revision to the NUREG 0588 radiation degradation. However, as noted above, a qualification test projram is underway with completion 61:

Refer to the generic discussion of SEK Text Paragraph 3.7, Aging. Ä

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HEGUIRE NUCLEAR STATION - UNIT SUMWARY OF ENVIRONMENTAL QUALIFICATION OF CLASS FE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION HADIATION ENVIRONMENT

EQUIPMENT IDENTIFOCATION (1)	MANUFAC TURFS	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RAD, STION LEVEL TO MITCH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Reliny	Struthers-Dunn	219	<1×10 ³ R (worst cise)	Note i	Note 1

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

NOIL: This component is not exposed to a harsh post-LOCA recirculation radiation environment (Refer to Note 1).

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRON-THAL QUALIFICATION OF CLASS SE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPHENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	RECINCULATION NADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Relay	Agastat	7000 Series	<1x10 ³ R (worst case) .	Bote :	Note (

The component listed above is a general application device. 's component is installed in NEMA type enclosures and depending on its specific design application, may be located in tarious areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

NOTE: This component is not exposed to a harsh posc-LOCA recirculation radiation environment (Refer to Note 1).

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MCGUINE NUCLEAR STATION - UNIT I SUMMARY OF ENVIROIMENTAL QUALIFICATION OF CLASS BE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MARUFACTURER	NODEL ON IDENTS: ICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	UNA LES L TO MILCH QUALIFIED (10)	QUALIFICATION REPORT AND HETHOD
Resistor	Gémite	Brown Devil	<1x10 ³ R (worst case)	Note i	Note 1

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

NOTE: This component is not exposed to a harsh post-LUCA recirculation radiation environment (Refer to Note 1).

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED CUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RAD'ATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	HANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (110) (2)	RADIATION LEVEL TO MHICH QUALIFIED (TID)	QUALIFICATION REPORT AND NETHOD
surge Suppressor	General Semiconductor	Transzorb	t.6x10 ⁶ R (worst case)	2×10 ⁷ R	Manufacturer's Specification data Std. Stk. #TIT-t-1 Method: Analysis

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus I year post LOCA) applicable to the component's locations.

SER ITEM

R: The radiation qualification of this component is as shown in the table above.

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

QM: This component has been qualified by analysis of previous material tests.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIROIMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND HETHOD
Switch and Indicating Light	Cutler-Hermor	£30 .	1. 14 10 ⁵ 4 (worst case)	Note 6	Note 6

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus I year post LOCA dose) applicable to the component's locations.

SER ITEM

R, QM, A qualification test program to document the radiation withstand capability of this component is in progress.

M, QT, A preliminary review of component's materials indicates that there are no materials susceptible to significant Q1: radiation degradation. However, as noted above, a qualification test program is underway with completion scheduled for December, 1981. The results of this test will be documented in a revision to the NUREG 0588 submittal.

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT 1 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION WUNBER	RECIRCULATION RADIATION ENVIRONNERT (TID) (2)	RADIATION LEVEL TO UNICH QUALIFIED (TID)	QUALIFICATION REPORT AND HETHOD
Switch and indicating Light	Cutler-Hammor	102507	5x10 ⁵ A (worst case)	Note 6	Note 6

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus I year post LOCA dose) applicable to the component's locations.

SER ITEM

R, QM, A qualification test program to document the radiation withstand capability of this component is in progress. ", QT, A preliminary review of component's materials indicates that there are no materials susceptible to significant QI: radiation degradation. However, as noted above, a qualification test program is underway with completion scheduled for December, 1981. The results of this test will be documented in a revision to the NUREG 0588 submittal.

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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HCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION HUBBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MHICH QUALIFIED (TID)	QUALIFICATION REPORT AND HETHOD
Tensinal Block	States	ZWH	2.4×10 ⁷ R (worst case)	Note 6	Note 6

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA dose) applicable to the component's locations.

SER ITEM

R, QM, A qualification test program to document the radiation withstand capability of this component is in progress.
M, QT, A preliminary review of component's materials indicates that there are no materials susceptible to significant
QI: radiation degradation. However, as noted above, a qualification test program is underway with completion scheduled for December, 1981. The results of this test will be documented in a revision to the NUREG 0588 submittal.

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT I SURWARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPLOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR I DEM TI FICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MITCH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Terminal Block	Buchanan	Solio Link SS 6 TS	<1x10 ³ R (worst case)	Note 1	Note !

The component listed above is a general application device. This component is installed in NEMA type enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case radiation environment (40 year normal dose plus 1 year post LOCA) applicable to the component's locations.

SER ITEM

NOTE: This component is not exposed to a harsh post-LOCA recirculation radiation environment (Refer to Note 1).

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HCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT ISENTIFICATION - (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Annulus Vent Fan Unit Control Panel-Limiting Component:	Furr Co		3×10 ⁷ RAD	(tiote 6)	(Note 6)

SER ITEM

R, QI: The radiation qualification of the components in this panel is currently under review. This review and any required action is scheduled for completion in January, 1982.

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND HETHOD
ABFU. Allison Control Penel- Limiting Component:	Allison	(Note 6)	Sx 107AAD	(Note 6)	(Note 6)

SER ITEM

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R, QI: The radiation qualification of the components in this panel is currently under review. This review and any required action is scheduled for completion in January, 1982.

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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HCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	NODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND RETHOD
Proportional Temperature Controller	Love Controls	54, 834, 838, 8134, 8160, 8165, 8173 and 8174	2×10 ⁴ 840	(Note 7)	(Note 7)

SER ITEM

- R, QI: The radiation qualification test program is currently in progress. The expected completion date for the test program is January, 1982. The results of this rest will be documented in a revision to the NUREG 0588 submittal.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT ? SUMMARY OF ENVIRONHENTAL QUALIFICATION OF CLASS IE EQUIPMENT De containment and exposed to the Post-Loca recirculation radiation environ

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REPORT AND HETHOD	(Mote 7)
LEVEL TO MILCH QUALIFIED (TID)	(Mote 7)
RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	5×10 ⁵ 840
KOPEL OR IDENTIFICATION NUMBER	8006-603
MANUFAC TURER	United Electric
EQUIPHENT IDENTIFICATION (1)	High Temperature Datection Thermostat

SER ITEM

- The radiation qualification test program is currently in progress. The expected completion date for the test program is January, 1982. The results of this rest will be documented in a revision to the NUREG 0588 submittal. R, QI:
- Refer to the generic discussion of SER Text Paragraph 3.7, Aging. :H

McGUIRE NUCLEAR STATION - UNIT 1 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPHENT IDENTIFICATION (1)	MANUFACTURER	NODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALSFICATION REPORT AND METHOD
Resistance Temperature Datector	Weed	101-1.2N-A-3-C-6-2-1	2×10 ⁴ AAD	(Note 7)	(Note 7)

SER ITEM

- R, QI: The radiation qualification test program is currently in progress. The expected completion date for the test program is January, 1982. The results of this rest will be documented in a revision to the NUREG 0588 submittal.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPHENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TIO) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Differential Pressure Switch	Solon	78510W	5.2×10 ⁵ MD	(Note 7)	(Note 7)

SER ITEM

R, QI: The radiation qualification test program is currently in progress. The expected completion date for the test program is January, 1982. The results of this rest will be documented in a revision to the NUREG 0588 submittal.

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A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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McGUIRE NUCLEAR STATION - UNIT 1 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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Differential Pressure	Solon	TESIADA	5×10 ⁵ RAD	(Note 7)	(Note 7)
EQ. PMENT IDENTIFICATION (1)	MANUFACTURER	NODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION Environment (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD

SER ITEM

- R, C: The radiation qualification test program is currently in progress. The expected completion date for the test program is January, 1982. The results of this rest will be documented in a revision to the NUREG 0588 submittal.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT I SURWARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE FOST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPHENT IDENTIFICATION (1)	MANUFACTURER	NODEL DR I DENTIFICATION MUNBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND NETHOD
Diesel Batterles Worst Case: IEDGB	NIFe	HIP-4	5×10 ³ RAD	(Note 5)	(Note 5)

SER ITEM

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

R:

This deficiency was deleted per discussion with M. Slosson, NRC-EQB, 07-08-81.

MCGUIRE NUCLEAR STATION - UNIT I SUPWARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Residual Heat Removal Pumps IA and 18 motors	Westinghouse, Buffelo	71F13494-1572, 71F13494-2572 71F13495-1572, 71F13495-2572 (Note 3)	5.2x10 ⁵ RAD	2×10 ⁸ MD	WCAP 8754 Rev 1 WCAP 7829 Method: Test and Analysis

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A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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McGUIRE MUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

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EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION WUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) /2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD	
RHR and Containment Spray Rooms Sump Pumps IA and IB motors	All1s-Chalmars		9. 1×10 ⁴ MD	1×10 ⁵ AAD	Documentation requested Hethod: Test	

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A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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NCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION MUNBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	NADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIF:CATION REPORT AND HETHOD
Annuius Ventilation System Fans IA and IB motors	Joy/Rellance	216-273608	1×10 ⁶ MAD	1×10 ⁶ 8AD	Rallance Latter dated 8/3/80

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A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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McGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MHICH QUALIFIED. (TID)	QUALIFICATION REPORT AND NETHOD
Auxillary Bullding Filtered Exhaust Fans IA and 18 motors	Rallanca	IYF-882612	5×10 ⁴ RAD	2×10 ⁸ 8AD	Metlance Report HUC-9, 7/1/78 Hethod: Test and Analysis

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A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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NCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IBENTIFICATION MUMBER	RECIRCULATION RADIATION ENVIRONMENT (YID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION BF TOAT AND HE THOU
Diesel Generator Ventilation Fans IA and 16 motors	Joy/Rellance	IYF-273608	2x10 ⁴ KAD	1× 10 ⁶ RAD	Relience Letter dated 8/3/80 Hethod: Test and Analysis

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A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR SUATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECILCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MAINUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MIICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
RHR Pump Air Handling Units IA and 18 motors and CS Pump Air Handling Units IA and 18 motors	Rallanca	2YF-882311	7x 10 ⁵ rad	2×10 MAD	Rellance Report HUC-9, 7/1/78 Method: Test and Analysis

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A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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NCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	NODEL OR IDENTIFICATION NUMBER	RECIACULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
600 Volt Load Centers Worst case: IELXD	Gould	K-Line	6×10 ⁴ RAD	Ix 10 ⁵ RAD	Report 0H-302-618 (Note 4)

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A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUISHENT	No Distances								
Motor Control Centers Worst case: IEHXB4 and IEHXB5	Nelson Electric	HODEL OR IDENTIFICATION MANBER	AECIACULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD				
		Class 10350	6×10 ³ RAD	1×10 ⁵ RAD	Nelson Electric letter 6/27/8				
					Method: Test and Analysie				

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Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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> N-GUIRE NUCLEAN STATION - UNIT 1 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIRMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECINCULATION ANDIATION ENVIRONMENT

011 MENT 11 FICATION (1)	MANNE AC TURER	HODEL ON IDENTIFICATION NUMBER	RECERCULATION RADIATION ENVIRONENT (TED) (2)	NADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND NETHOD
ormers, ACP	Vest inghouse	FIN 75	04440 144	4×10 ⁴ AAD	Vestinghouse Transformer Div. Report 11/11/77, Life State- ment 11/14/77 Hethod: Test and Analysis

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Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	PANUFAC TURER	MODEL OR I DENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MHICH QUALIFIED (TID)	QUALIFICATION REPORT AND HETHOD
Motor Operated Dampers	Rotork	7A, 3HW	3x10 ⁷ RAD (worst case)	3×10 ⁷ RAD	Rotork Test Reports N11/4, dated 12/70 and TR-116, dated 10/73 Method: By similarity to Rotork NA2 Operator

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A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

Page 39 Revision 0 McGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ERVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIF CATION REPORT AND HETHOD
Limit Switch	Micro Switch	LSH4N	1×10 ⁶ RAD	- 1.2×10 ⁸ RAD	Micro Switch Report LTR # 15027-1

SER ITEM

A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO THE POST-LOCA RECIRCULATION RADIATION ENVIRONMENT

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO MAICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Containment Sump Level Transmitters	Berton	3864	4. 1×10 ⁷ RAD	2x 10 ⁸ RAD	Test Report 43904-1 Method: Test

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A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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MCGUIRE NUCLEAR STATION - UNIT 1

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

Note 1

Class IE equipment that is exposed to the post-LOCA recirculation radiation environment has been evaluated for proper radiation qualification and is included in this table if it is exposed to a total integrated dose equal to or greater than 1×10^3 RAD. A total integrated dose (i.e., forty year normal plus one year accident radiation dose) of less than 1×10^3 RAD is considered negligible.

Note 2

The recirculation radiation environment consists of the forty year normal operating radiation dose plus the dose received from one year of post-LOCA reactor coolant recirculation.

Note 3

The motors installed on Unit 1 pumps will be selected from the shop order numbers listed. All motors listed have been qualified in the same manner.

Note 4

The McGuire 600 volt load centers are qualified by similarity to 600 volt load centers at Oconee Nuclear Station as reported in Report Number OM-302-618.

Note 5

Radiation testing of this equipment is not required for levels below 1x10⁴ RAD per Section 8.1 of IEEE 535-1979.

Note 6

Documentation of radiation qualification is currently not available for the components used in the termination boxes and area termination cabinets. If documentation cannot be obtained, these components will either be tested, relocated, or replaced by a qualified substitute.

Note 7

A qualification program is currently in progress for these components. The results of this program will be reported upon completion.

MCGUIRE NUCLEAR STATION - UNIT 1 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

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MCGUIRE MUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO MELD ENVIRONMENT

EQUI PHENT IDENTIFICATION	HANDFACTURER	NODEL OR IDENTIFICATION HUMBER	MES W ENVIRGNMENT (1)	ENVIRONMENT TO MICH QUALIFIED	OPERABILITY REQUIRED IN HELD ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCUMACY REQUINED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND NETHOD
Centrifugal Charging Pump IA and IB Motors	West Inghouse, Buffalo	72F44587-1573 72F44587-2573 72F44587-3573 72F44587-3573 72F44587-4573 (Note 3)	Temp: 212 F	Temp: 212 F	Cont Invous	Cont I nuous	*	M.,	WCAP 8754 and Duke analyses on Westing- house Testing: MCC 1381,05-00-0101 MCC 1381,05-00-0102 Method: Test and Analysis

- H: These motors are totally enclosed, water cooled units which have a moisture resistant insulation system. Additionally, these, motors are provided with space heaters that keep the motor windings dry during non-operational periods. Therefore, the short-term duration of a high humidity condition that may result from a postulated pipe break would have no effect on performance of these motors.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: These motors are totally enclosed, water cooled units. As such a discussion of margin with respect to temperature and duration is not applicable since the motor internals will not be exposed to the short term temperature effects of the postulated pipe break.
- QM: As documented above, these motors have been qualified by a combination of test and analysis.
- P: These motors are located in areas of the Auxiliary Building which by design do not allow any appreciable pressure increases to occur during a postulated pipe break event. Additionally, these motors are not subject to direct impingement resulting from a break. Therefore, pressure is not a factor in the qualification of these motors.

MCGUIRE NUCLEAR STATION - UNIT I SURMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

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EQUIPMENT IDENTIFICATION	HARDFACTURER	MODEL OR IDENTIFICATION NUMBER	HELB ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND NETHOD
Component Cooling Pump 1A1, 1A2, 181 and 182 Motors	Westinghouse, Buffalo	72F44689-1574 72F44689-2574 72F44689-3574 72F44690-3574 72F44690-1574 72F44690-2574 72F44690-3574 72F44690-3574 72F44690-4574 (Note 3)	Temp; 212 F	Temp: 212 F	Cont I nuous	Cont Inuous	M	NA	WCAP 8754, and Duke analyses on Vesting- house testing MCC 1381.05-00-0101 MCC 1381.05-00-0102 Method: Test and Analysis

- H: These motors are totally enclosed, water cooled units which have a moisture resistant insulation system. Additionally, these motors are provided with space heaters that keep the motor windings dry during non-operational periods. Therefore, the short-term duration of a high humidity condition that may result from a postulated pipe break would have no effect on performance of these motors.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: These motors are totally enclosed, water cooled units. As such a discussion of margin with respect to temperature and duration is not applicable since the motor internals will not be exposed to the short term temperature effects of the postulated pipe break.
- 24: As documented above, these motors have been qualified by a combination of test and analysis.
- P: These motors are located in areas of the Auxillary Bullding which by design do not allow any appreciable pressure increases to occur during a postulated pipe break event. Additionally, these motors are not subject to direct implngement resulting from a break. Therefore, pressure is not a factor in the qualification of these motors.

NCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED DUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

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EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL GR IDENTIFICATION MENDE:	HELB ENVIRONHENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN MELD ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Nuclear Service Water Pump 1A and 18 Mocors	West Inghouse, Buffelo	72F36530-1575 72F36531-1575 72L10936-1575 72L10937-1575 (Note 3)	Temp: 212 F	Temp: 212 F	Cont I nuous	Cont Inucus	м.	**	WCAP 8754 and Duke analyses on Westing- house Testing: MCC 1381.05-00-0101 MCC 1381.05-00-0102 Method: Test and Analysis

SER ITEM

- H: These motors are totally enclosed, water cooled units which have a moisture resistant insulation system. Additionally, these motors are provided with space heaters that keep the motor windings dry during non-operational periods. Therefore, the short-term duration of a high humidity condition that may result from a postulated pipe break would have no effect on performance of these motors.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: These motors are totally enclosed, water cooled units. As such a discussion of margin with respect to temperature and duration is not applicable since the motor internals will not be exposed to the short term temperature effects of the postulated pipe break.

QM: As documented above, these motors have been qualified by a combination of test and analysis.

- P: These motors are located in areas of the Auxillary Building which by design do not allow any appreciable pressure increases to occur during a postulated pipe break event. Additionally, these motors are not subject to direct impingement resulting from a break. Therefore, pressure is not a factor in the qualification of these motors.
- R: This deficiency was deleted per discussion with M. Slosson, NRC-EQB, 07-08-81.

HEGUIRE NUCLESS STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPHENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELD ENVIRONMENT

EQUIPMENT IDENTIFICATION	NANUFACTURER	NODEL OR IDENTIFICATION MUMBER	HELB ENVIRGHENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCUPACY REQUIRED	ACCURACY DEHONSTRATED	QUALIFICATION REPORT AND METHOD
Safety Injection Pump IA and IB Motors	West Inghouse, Buffalo	73F69618-1575 73F69618-2575 73F69618-3575 73F69618-4575 (Note 3)	Temp: 212 F	Temp: 212 F	Cont Inuous	Cont Inuous	NA	NA .	WCAP 8754 and Dake analyses on Westing- house Testing: MCC 1381.05-00-0101 MCC 1381.05-00-0102 Method: Test and Analysis

SER ITEM

- H: These motors are totally enclosed, water cooled units which have a moisture resistant insulation system. Additionally, these motors are provided with space heaters that keep the motor windings dry during non-operational periods. Therefore, the short-term duration of a high humidity condition that may result from a postulated pipe break would have no effect on performance of these motors.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: These motors are totally enclosed, water cooled units. As such a discussion of margin with respect to temperature and duration is not app?!cable since the motor internals will not be exposed to the short term temperature effects of the postulated pipe break.
- QM: As documented above, these motors have been qualified by a combination of test and analysis.
- P: These motors are located in areas of the Auxillary Building which by design do not allow any appreciable pressure increases to occur during a postulated pipe break event. Additionally, these motors are not subject to direct impingement resulting from a break. Therefore, pressure is not a factor in the qualification of these motors.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPUSED TO HELB ENVIRONMENT

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EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION HUMBER	HELS ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPENABILITY DEMONSTRATED	ACCURACY	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Spent Fuel Cooling Pump 1A and 18 Motors	West Inghouse, Buffalo	72F44649-1574 72F44649-2574 72F44650-1576 72F44650-2576 (Note 3)	Temp: 132,4 F	Temp: 145 F	Cont I nuous	Cont Incous	NA	NA	WCAP 8754, and Duke analysis on Vesting- house testing: MCC 1381.05-00-0101 M-thod: Test and Analysis

- H: These motors are totally enclosed, fan cooled units which have a moisture resistant insulation system. Additionally, these motors are provided with space heaters that keep the motor windings dry during non-operational periods. Therefore, the short-term duration of a high humidity condition that may result from a postulated pipe break would have no effect on performance of these motors.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: These motors are totally enclosed, fan cooled units. As such a discussion of margin with respect to temperature and duration is not applicable since the motor internals will not be exposed to the short term temperature effects of the postulated pipe break.
- QM: As documented above, these motors have been qualified by a combination of test and analysis.
- P: These motors are located in areas of the Auxillary Building which by design do not allow any appreciable pressure increases to occur during a postulated pipe break event. Additionally, these motors are not subject to direct implagement resulting from a break. Therefore, pressure is not a factor in the qualification of these motors.

MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELD ENVIRONMENT

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EQUIPMENT IDENTIFICATION	HANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HELB ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND HETHOD
Fuel Pool Air Hendling Unit	Reilance	3YF-882311	Temp: 132.4 F	Temp; 150 F	Cont Inuous	Cont Inuous	NA	NĂ	M L Ward talter to file MCM 1320.00 dated 7/17/80 Method: Analysis

SER ITEM

- H: These motors are totally enciosed, fan cooled units which have a moisture resistant insulation system. Additionally, these motors are provided with space heaters that keep the motor windings dry during non-operational periods. Therefore, the short-term duration of a high humidity condition that may result from a postulated pipe break would have no effect on performance of these motors.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: These motors are totally enclosed, fan cooled units. As such a discussion of margin with respect to temperature and duration is not applicable since the motor internals will not be exposed to the short term temperature effects of the postulated pipe break.

QM: As documented above, these motors have been qualified by a combination of test and analysis.

P: These motors are located in areas of the Auxillary Building which by design do not allow any appreciable pressure increases to occur during a postulated pipe break event. Additionally, these motors are not subject to direct implngement resulting from a break. Therefore, pressure is not a factor in the qualification of these motors.

HEGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

EQUIPHENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION HURBER	HELB ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB EMVIRONNERT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD .
Current/Voltage Alarm	RIS	ET1215	Temp: 132.4 F (worst case)	Temp: 140 F	Continuous	Cont Ir Jours	±2.5% of span	t 0.5% of span	Hanufacturer's specifica- tion data Std. Stk. V-A-4

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxillary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.
- QT: For Operability Required stated as "Continuous", the component is to be functional continuously for the duration of the pipe break environment (See Note 2). For Operability Demonstrated stated as "Continuous", the component has been determined to be capable of performing its function for the duration of the pipe break environment.
- QI: This deficiency is not applicable for this component with regard to a postulated pipe break environment.

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HEGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

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EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OA IDENTIFICATION NUMBER	HELB ENVIRONMENT (1)	ENVIRONMENT TO MHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Fuse	Bussmann	FNA	Temp: 212 F (worst case)	Temp: 212 F	Continuous	Cont Inuous	N/A	N/A	Derates per manufac- turer's curve Std. Stk. Mill-A-4

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.
- QT: For Operability Required stated as "Continuous", the component is to be functional continuously for the duration of the pipe break environment (See Note 2). For Operability Demonstrated stated as "Continuous", the component has been determined to be capable of performing its function for the duration of the pipe break environment.
- QI: This deficiency is not applicable for this component with regard to a postulated pipe break environment.

MCGUIRE NUCLEAR STATION - UNIT 1 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELF ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	HELS ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONHENT (2)	OPE2ABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Fuse	Bus smann	KTK	Temp: 212 F (worst case)	Temp: 212 F	Continuous	Continuous	N/A	N/A	Derate per manufac- turer's curve Std. Stk. #III-A-4 Method: Analysia

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection of forded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

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HCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELD ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	HELB ENVIRONHENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELD ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Fuse block	Bussmann	3792	Temp: 212 F (worst case)	Temp: 250 F	Continuous	Continuous	N/A	N/A	Bussmann Hanufacturing report dated 3/13/79 Method: Analysis

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

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HCGUIRE NUCLEAR STATION - UNIT I SUMWARY OF ENVIRONMENTAL QUALIFICATION OF C ASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION MANBER	HELB ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
e block	8us smann	3839	Temp: 212 F (worst case)	Temp: 250 F	Cont Invous	Centinuous	N/A	N/A	Bussmann Manufacturing report dated 3/13/79 Hethod: Analysis

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design opplication, may be located in various areas of the Auxiliary Building. This table addresses the qualification of the component with respect to the worst-case pipe break environment applicable to the component's location.

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

HCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	HELO ENVIRONMENT (1)	ENVIRONMENT TO MHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Fusa block	ชินรรตอกก	4439	Temp: 212 F (worst case)	Тевр: 250 F	Continuous	Cont Inuous	N/A	N/A	Bussmann Nanufacturing report dated 3/13/79 Method.: Ancipsis

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

Page 12 Revision 0 HEGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELD ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	HELB ENVIRCIMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY	QUALIFICATION REPORT AND METHOD
Fuse block	Bussmann	4575	Temp: 212 F (worst case)	Temp: 250 F	Continuous	Continuous	N/A	N/A	Bussmann Hanufacturing report dated 7/24/80 Hethod: Analysis

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

Page 13 Revision () MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELD ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HELB ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELD ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Indicating Light	Cutier-Hammer	629	Temp: 240 F (worst case)	Temp: 255 F	Continuous	Cont Inuous	N/A	R/A	Duke Steam Production Qualification & Test Facility Report TR-010 Method: Test

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the gualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

Page 14 Revision C HEGUIRE NUCLEAR STATION - UNIT I SUNMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HEID ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	HELD ENVIROMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IM HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEHONSTRATED	QUALIFICATION REPORT AND METHOD
Optical isolator	E-Hax	1750123	Temp: 132.4 F (worst case)	Temp: 140 F	Cont Invous	Continuous	± .5% at .9%	of span	Specified in Annuals CNM-1338.00-002 CNM-1338.00-003 Method: Analysis

The component listed above is a general application device. This component is instal'_d in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

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NCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

EQUIPMENT IDENTIFICATION	HANUFACTURER	HODEL OR IDENTIFICATION NUMBER	HELB ENVIRO NM ENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
fower Supply	Lambda	· 105	Temp: 132.4 F (worst case)	Temp: 160 F	Continuous	Cont Inuous	±10% regulation of output voltage	t 1% regulation of output voltage	Manufacturer's specifica- tion data Std. Stk, #V117-C-1

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pive break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.
- QT: For Operability Required stated as "Continuous", the component is to be functional continuously for the duration of the pipe break environment (See Note 2). For Operability Demonstrated stated as "Continuous", the component has been determined to be capable of performing its function for the duration of the pipe break environment.
- 01. This deficiency is not applicable for this component with regard to a postulated pipe break environment.

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MCCUIRE HUCLEAR STATION - UNIT I SUMMARY OF ENVIROBMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIROBMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	HELB ENVERONMENT (1)	ÉNVIRONMENT TO MHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Belay	Cutler-Hanmer	023	Temp: 240 F (worst case)	Temp: 255 F	Continuous	Continuous	N/A	N/A	Duke Steam Production Qualification & Test Facility Report TR-010 Rethod Test

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

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HEGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LUCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	HELB ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELD ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Re1ay	Cutler-Hammer	D26	Temp: 240 F (worst case)	Temp: 255 F	Continuous	Cont Inuous	N/A	N/A	Duke Steam Production Qualification & Test Facility Report TR-040 Hethod: Test

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

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MCGUIAE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENT^L QUALIFICATION OF CLASS TE EQUIPMENT LUCATED OUTSIDE CONTAINMENT AND EXPOSED TO NELB ENVIRONMENT

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EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION MUNBER	HELB ENVIRONALENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEHONSTRATED	QUAL IFICATION REPORT AND METHOD
Relay	Struthers-Dunn	219	Temp: 212 F (worst case)	Temp: 222 F	Continuous	Cont I nuou s	N/A	N/A	McGuire Nuclear Station Pipe Rupture Temperature Component Test File: 65-640,00 Method: Test

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.
- T: The temperature qualification for this component is as shown in the table above.

MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO NELL ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION HUMBER	HELS ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERAGILITY REQUIRED IN HELD ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURAC* DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Relay	Agəstat	7000 Series	Temp: 130 F (worst case)	Temp: 165 F	Cont Invous	Continuous	N/A	11/A	Agastat specification data Std. Stk. VII-C-5

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effe of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure. that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.
- T: The temperature qualification for this component is as shown in the table above.
- QT: For Operability Required stated as "Continuous", the component is to be functional continuously for the duration of the pipe break environment (See Note 2). For Operability Demonstrated stated as "Continuous", the component has been determined to be capable of performing its function for the duration of the pipe break environment.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED DUISIDE CONTAINMENT AND EXPOSED TO HELD ENVIRONMENT

	TURER IDENTIFICATIO NUMBER	R ENVIRGNMENT (1)	TO WHICH QUALIFIED	REQUIRED IN HELD ENVIRONMENT (2)	DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Resistor Obmit	e Brown Devil	Temp: 132.4 F (worst case)	Temp: 140 F	Cont Inuous	Continuous	± 3% of resistor value	tl% of resistor v lue (Based on the temperature coefficient and a	Derated per manufacturer's curve std. Stk, 1x-8-2 Method- Analysis

the component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.
- T: The temperature qualification for this component is as shown in the table above.
- QT: For Operability Required stated as "Continuous", the component is to be functional continuously for the duration of the pipe break environment (See Note 2). For Operability Demonstrated stated as "Continuous", the component has been determined to be capable of performing its function for the duration of the pipe

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

EQUIPHENT	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HELD ENVIRONALENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEHONSTRATED	QUALIFICATION REPORT AND METHOD
Surge Suppressor	General Semi- conductor	Transzorb	Temp: 212 F (worst case)	Temp: 302 F	Cont Invous	Continuous	N/A	N/A	Duke Esterial/Component Documentation Form Std. Stk III-C-1 Method: Analysis

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has leen provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

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HCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

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EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HELB SMVI ROMMENT (1)	ENVIRONMENT TO MHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ERVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUINED	ACCURACY DEHONSTRATED	QUALIFICATION REPORT AND METHOD
Switch and indicat- ing Light	Cutler-Hammer	. E30	Temp: 212 F (worst case)	Temp: ,255 F	Cont Inuous	Continuous	N/A	N/A	Duke Stean Production Qualification & Test Facility Report TR-010 Nethod: Test

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

- It: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the anclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

ACCUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELD ENVIRONMENT

EQUIPHENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION MUMBER	HELB ENVIRONHENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY CEQUIRED IN HELD ENVIRONMENT (2)	OPEN JILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Switch	Cutler-Hanner	102501	Temp: 240 F (worst case)	Temp: 255 F	Continuous	Cont Inuous	N/A	N/A	Duke Steam Production Qualification & Test Facility Report TR-010 Method: Test

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.

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NCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION MUMBER	HELB ENVIRONNENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN NELB ENVIROMMENT (2)	OPERABILITY DEHONSTRATED	ACCURACY	ACCURACY DEHONSTRATED	QUALIFICATION REPORT A"O NETHOD
Terminal Block	States	Zum	Temp: 240 F (worst case)	Temp: 346 F	Contlaupus	Continuous	N/A	N/A	Duke Steam Production Qualification 5 Test Facility Report 18-026 Method: Test

The component listed above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxiliary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

SER ITEM

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis c* the components specific design capabilities.

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MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED DUTSIDE CONTA: MHENT AND EXPOSED TO HELD ENVIRONMENT

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EQUIPMENT IDENTIFICATIOC	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	HELB ENVIRONMENT (1)	ENVIRONMENT TO MILCH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OFERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Terminal Block	Buchanan	Solid Link 55 æ T5	Temp: 132.4 F (worst case)	Yemp: 302 F	Cont Inuous	Continuous	N/A	N/A	Buchanon Specification data Std. Stk. 1V-B-2 & IV-B-3 Method Analysis

The component list 1 above is a general application device. This component is installed in metal enclosures and depending on its specific design application, may be located in various areas of the Auxillary Building. This table addresses the qualification of this component with respect to the worst-case pipe break environment applicable to the component's location.

- H: This component is installed in a totally enclosed, metal enclosure and is protected from the direct effects of a postulated pipe break. Therefore, the short-term duration of a high humidity condition outside the enclosure that may result from a pipe break would not effect the performance of this component installed inside the enclosure.
- P: This component is installed in a metal enclosure which may be located in various areas of the Auxiliary Building. These areas of the Auxiliary Building by design do not allow any appreciable pressure increase to occur during a postulated pipe break event. Therefore pressure is not a factor in the qualification of this component.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: This component is installed in a metal enclosure. Margin has been provided in the evaluation of this component in that the evaluation considered the full effects of the applicable pipe break temperature with no credit taken for the protection afforded by the enclosure.
- QM: This component has been qualified for its application by test or by analysis of the components specific design capabilities.
- QT: For Operability Required stated as "Continuous", the component is to be functional continuously for the duration of the pipe break environment (See Note 2). For Operability Demonstrated stated as "Continuous", the component has been determined to be capable of performing its function for the duration of the pipe break "onment.
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N-CUIRE NUCLEAN STATION - UNIT 1 SUPPLARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPHENT LOCATED OUTSIDE CONTAINNERT AND EXPOSED TO HELB ENVIRONMENT

EQUIPERITY ON	MANUF AC TURE R	NOBEL ON IDENTIFICATION MUNDEN	HELB ENVIAUNHENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OFENABILITY REQUIRED IN HELB ENVIRONMENT (2)	DEMONSTRATED	AC CURACY REQUINED	ACCURACY DRIMONS TRATED	QUALIFICATIO REPORT AND METHOD
Valve Solenold Operators	Asco	3963366 AN	7:=:p: 330 F	Temp: 346 F	Continuous	Cont I nuous	ž	N	Test Report: AgS21678/TR Method: Test

SER ITEM

- For Operability Demonstrated stated as "Continuous", For Operability Required stated as "Continucus", the valve solenoid operator is to be functional continuously for to be capable of performing its function for the short-term duration short-term duration of the pipe break environment (See Note 2). determined has been of the pipe break environment. valve operator E hu: the QT:
- These valve solenoid operators have been qualified by test for operation in a 100% relative humidity environment. ÷
- rt These valves are located in various areas of the Auxiliary Building. These areas by design do not allow any appreciable pressure increases to occur during the postulated pipe break event. Therefore, pressure is not factor in the qualification of these valve motor operators. å
- Refer to the generic discussion of SER Text Paragraph 3.7, Aging. A:
- The margin with respect to temperature is as noted in the table above. ž
- This equipment was qualified by test as noted in the table above. SM:

MCGUIRE NUCLEAR STATION - UNIT I SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT 0

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EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION NUMBER	HELB ENVIRONMENT (1)	ENVIRONMENT YO MHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND NETHOD
Valve Motor Operators	Limitorque	SMB Order Numbers: 375826-A, 375834-A 175829-A, 375835-A 175831-A, 379664-B 375832-A, 379857-A 375833-A	Yemp: 212 F	Temp: 250 F	Cont Inuous	Cont Inuous	N4	NA	Limitorque Test Report: 800,8, 1/11/80 Method: Test
		SMB Order Numbers: 383584-A and 391179-A	Temp: 212 F	Temp: 340 F	Cont Inuous	Cont Inuous	NA .	**	Limitorque Test Report : B0058, 1/11/80 Mcraol

SER ITEM

These valve motor operators have been qualified by test for operation in a 100% relative humidity environment. H:

- These valves are located in various areas of the Auxiliary Building. These areas by design do not allow any P: appreciable pressure increases to occur during the postulated pipe break event. Therefore, pressure is not a factor in the qualification of these valve motor operators.
- Refer to the generic discussion of SER Text Paragraph 3.7, Aging. A.
- The margin with respect to temperature is as noted in the table above. M:
- This equipment was qualified by test as noted in the table above. QM:

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MCGUIRE NUCLEAR STATION - UNIT 1 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS TE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT 29

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EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION MUGBER	HELB ENVIROMMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUINED	ACCURACY DEHONSTRATED	QUALIFICATION REPORT AND METHOD
Valve Motor Operators	Rotork	7NA2 30NA2 11NA2 40NA2 14NA2 70NA2 16NA2 90NA2	Temp: 212 F	Temp: 163 F (Note 4)	Cont Inuous	Cont Inuous	NA	NA	Rotork Test Reports: N11/4, December 1970 TE116, October 1973 TR222, June 1975 TR3025, April 1980 Method: Test
		7NA 1 30NA 1 11NA 1 40NA 1 14NA 1 70NA 1 16NA 1 90NA 1	Temp: 212 F	'Temp: 340 F	Cont Inuous	Cont Inuous	NA	NA	Rotork Test Reports: N117 ⁶ , December 1970 Tk116, October 1973 TR222, June 1975 Method: Test

SER ITEM

- H: These value motor operators have been qualified by test for operation in a 100% relative humidity environment.
- P: These values are located in various areas of the Auxiliary Building. These areas by design do not allow any appreciable pressure increases to occur during the postulated pipe break event. Therefore, pressure is not a factor in the gualification of these value motor operators.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: The margin with respect to temperature is as noted in the table above.
- QM: This equipment v s qualified by test as noted in the table above.

MCGUIRE NUCLEAR STATION - WHIT I SURWARY OF ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	HODEL OR IDENTIFICATION HUMBER	HELB ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRES	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Stem Hounted Limit Switches	NAMCO	EA-170-302	Temp: 212 F	Temp: 248 F	er Alnuous	Cont Inuous	NA	NĂ	NAMEO Test Report for EA-170-302 dated 3/28/80

SER ITEM

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- T: The temper ture qualification for this limit switch has been upgraded from 212°F to 248°F based on additional testing by NAMCO.
- H: This limit switch is qualified for operation in a 100% relative humidity environment.
- P: This limit switch is located in various areas of the Auxiliary Building. These areas by design do not allow any appreciable pressure increases to occur during the postulated pipe break event. Therefore, pressure is not a factor in the qualification of this limit switch.
- A: Refer to the generic discussion of SER Text Paragraph 3.7, Aging.
- M: The margin with respect to temperature is as noted in the table above.
- QM: This equipment was qualified by test as noted in the table above.

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McGUIRE NUCLEAR STATION - UNIT 1 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT LOCATED DUTSIDE CONTAINMENT AND EXPOSED TO HELD ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURES	HODEL OR IDENTIFICATION NUMBER	HELB ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Limit Switch	NAME	EA180 EA740	Temp: 212 F	Temp: 340 F	Continuous	Continues	NA	NA	NAMCO Test Reports dates 3/3/78 6 2/20/78 Method: Test

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NOTE: These limit switches are identical to those installed inside the containment. Refer to the SER response for incontainment equipment.

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MCGUIRE NUCLEAR STATION UNIT 1

ENVIRONMENTAL QUALIFICATION OF CLASS IE EQUIPMENT LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

Note 1

The methods employed to evaluate pipebreaks and to deta, ine the resulting environmental parameters are discussed in Duke Power Company Report MDS/PDG-77-1. The Evaluation of the Effects of Postulated Pipe Failures Outside Containment for McGuire Nuclear Station.

Note 2

The HELB environment is assumed to exist for $2\frac{1}{2}$ hours based on 30 minutes at the peak temperature after which action by the operator isolates the break and allows Auxiliary Building temperature to decrease to normal ambient in 2 hours.

Note 3

The motors installed on Unit 1 pumps will be selected from the shop order numbers listed. All motors listed have been qualified in the same manner.

Note 4

Rotork Test Report TR-3025 shows that when the qualified temperature for these valves is exceeded, the torque switches may fail on the next operation of the valve. Since at least one additional operation is available after the valve's temperature qualification has been exceeded, the valve can be relied upon to move to its safety position.