

# DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.  
VICE PRESIDENT  
SILAH PRODUCTION

TELEPHONE: AREA 704  
373-4083

August 17, 1981

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

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

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

Dear Mr. Deaton:

The attached information is Duke Power Company's response to the "deficiencies" noted in the NRC Staff "Safety Evaluation - Environmental Qualification of Safety-Related Electrical Equipment" as transmitted in SSER No. 5, Appendix 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 1E Equipment Located inside Containment.
- 2) Summary of Environmental Qualification of Class 1E Equipment Located outside Containment 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 submittal on environmental qualification of Class 1E equipment, we would be happy to meet with you.

Very truly yours,

*William O. Parker, Jr.*  
William O. Parker, Jr. *By [Signature]*

GAC/php  
Attachment

8108240109 810817  
PDR ADOCK 05000369  
E PEY



*A048  
5/11*

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

cc: Ms. M. J. Graham  
Resident Inspector  
McGuire Nuclear Station

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

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

NRC letters dated October 15, 1979 and February 15, 1980 concerning the environmental qualification of Class 1E equipment defined the NRC Staff's 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:

- 1) Provide a table listing by generic type all Class 1E equipment including the appropriate qualification data for the equipment. The format for this table was provided in the Staff's October 15, 1979 letter.
- 2) Review the adequacy of the environmental qualification for the equipment identified in Item 1 above with respect to the Staff's position described in NUREG 0588, 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 1E 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 1E 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, 1980.

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 accompanying tables.

SER Text - Paragraph 3.1

This paragraph of the SER addresses the completeness of the Class 1E 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 1E 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 15, 1981.

SER Text - Paragraph 3.2

This paragraph of the SER addresses the basis of the service conditions identified in the NUREG 0588 submittal. In this paragraph the Staff 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 humidity 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  $10^5$  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  $10^5$  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 skimmer fans take suction from the lower containment and discharge in the upper containment following either a LOCA or MSLB. 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 1E equipment also located in the upper containment for the following reasons:

1. 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 located at elevation 820 which is approximately 50 feet above the operating check. There is no Class 1E equipment located in the direct discharge 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 maximum 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 1E equipment located inside the containment and have provided the requested information as appropriate on the attached table.

SER Text - Paragraph 3.7

This paragraph 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 safety-related valve 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 not a requirement in qualification programs committed to IEEE 323-1971 (i.e., Category III 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, IEEE 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 mentioned 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.

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT



MCUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

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)
Transmitter - Pressurizer Pressure (Lower containment)	Barton	763 (Lot 2)	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $2.5 \times 10^6$ R Chem Spray: N/A	Temp: 380 F Press: 75 psig RH: 100% Rad: $5 \times 10^7$ R Chem Spray: Boric acid and sodium hydroxide soln.	SI Initiation (65 min.)	5 minutes post DBE	+ 10%	Max. Error 7.7% (5 min)	WCAP 5885 Method. Test

SER ITEM

CS: These transmitters are not exposed to any degradation from the effects of chemical spray prior to performing their safety function.

A: 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. 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.

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

Page 2  
Revision 1

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)
Transmitter - Pressurizer Level (Lower containment)	Barton	764 (lot 2)	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $1.4 \times 10^7$ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 380 F Press: 75 psig RH: 100% Rad: $5 \times 10^7$ R Chem Spray: Boric acid and sodium hydroxide soln.	2 weeks post DBE	4 months post DBE	± 25%	Max. Error 15%	WCAP 9885 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: 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 79-01B) 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: This deficiency was deleted per discussions with M. Slosson, NRC-EQB, 7-8-81.

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

Page 3  
Revision 1

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)
Transmitter - S/G Level (NR) (Lower containment)	Barton	764 (Lot 2)	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $2.3 \times 10^7$ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 380 F Press: 75 psig RH: 100% Rad: $5 \times 10^7$ R Chem Spray: Boric acid and sodium hydroxide soln.	Reactor trip (<5 min.) Plus 4 months post DBE	4 months post DBE	Trip Function: $\pm 5\%$ (5 min) PAM Function: $\pm 25\%$ (4 mo)	$\leq 5\%$ (5 min) Max Error 15% (4 mo) (Note 5)	WCAP 9885 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: 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 79-01B) 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 environment based on conservative aging procedures referenced in WCAP-9885. This conservative basis (0.5 ev in the Arrhenius equation) ensures that adequate margin exists.

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

Page 4  
Revision 1

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)
RTD - RCS Temperature (NR) (Lower containment)	Rosemount	176 KF	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $1 \times 10^8$ R Chem Spray: N/A	Temp: 332 F Press: 66 psig RH: 100% Rad: $1 \times 10^8$ R Chem Spray: Boric acid and sodium hydroxide soln.	Reactor Trip (< 5 min)	5 MIN POST SLB	$\pm 0.2\%$	$\pm 0.2\%$	WCAP 9157 and Duke letter Parier to Denton dated December 19, 1979  Method Test/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. 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. In addition, radiation aging has been adequately addressed by the Westinghouse test program. A marginal application of one material (ethylene propylene 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  $1 \times 10^8$  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.

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

Page 5  
Revision 1

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)
RTD - Temperature (WR Power containment)	Rosemount	176 KS	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $1 \times 10^8$ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 332 F Press: 66 psig RH: 100% Rad: $1 \times 10^8$ R Chem Spray: Boric acid and sodium hydroxide soln.	2 weeks post DBE	2 weeks Post DBE	$\pm 0.2\%$	$\pm 0.2\%$	WCAP 9157 and DuRe letter Parker to Denton dated December 19, 1979  Method: Comparison to Model 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 H<sub>2</sub>O 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 comparison, 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  $1 \times 10^8$  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.

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

Page 6  
Revision 1

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)
Electric Hydrogen Recombiner (Upper containment)	W Sturtevant	A	Temp: 180 F Press: 14.8 psig RH: 100% Rad: $8.1 \times 10^7 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 309 F Press: 62 psig RH: 100% Rad: $2 \times 10^8 R$ Chem Spray: Boric acid and sodium hydroxide soln.	3 months post LOCA	1 year post LOCA	N/A	N/A	WCAP 7820 and Supplements 1-4 WCAP 7709-L and Supplements 1-4 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: WCAP 7709-L, Supplement 2 describes chemical spray testing conducted on the H<sub>2</sub> 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 H<sub>2</sub> Recombiner are not known to be susceptible to significant degradation due to aging.

All electrical components furnished with the W electric recombinder 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  $2 \times 10^8$  rads gamma followed by another LOCA test as described in WCAP 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-L and Supplements 1-4, it is felt that the H<sub>2</sub> recombinder 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.

McGUIRE NUCLEAR STATION - UNIT 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

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)
Containment Air Return Fan Motors (Upper containment)	Joy/Reliance	2XF-330081	Temp: 180 F Press: 14.8 psig RH: 100% Rad: $7.6 \times 10^7 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 330 F Press: 85 psig RH: 100% Rad: $1 \times 10^9 R$ Chem Spray: Boric acid and sodium hydroxide soln.	2 months post DBE	1 year post DBE	N/A	N/A	Test Report FF-14282 and Supplemental Technical Paper TA-408 Test Report X-604 Test Report NUC-9 and Supplement 4/14/80 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: 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.

McGUIRE NUCLEAR STATION - UNIT 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

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)
Hydrogen Skimmer Fan Motors (Upper Containment)	Joy/Reliance	1 YF-882315	Temp: 180 F Press: 14.8 psig RH: 100% Rad: $7.6 \times 10^7 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 330 F Press: 85 psig RH: 100% Rad: $1.0 \times 10^9 R$ Chem Spray: Boric acid and sodium hydroxide soln.	2 months post DBE	1 year post DBE	N/A	N/A	Test Report 79-14282 and Supplement #1 Technical paper: TA-4051 Test Report X-604 Test Report NUC-9 and Supplement 4/14/80 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: 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.



McGUIRE NUCLEAR STATION - UNIT 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

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 Motor Operators (lower containment)	Rotork	7 NAI, 11 NAI, 14 NAI, 16 NAI, 30 NAI, 40 NAI, 70 NAI, 90 NAI	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $6.7 \times 10^7 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 340 F Press: 75 psig RH: 100% Rad: $2 \times 10^8 R$ Chem Spray: Boric acid and sodium hydroxide soln.	5 min (Notes 8 and 9)	30 days post DBE	N/A	N/A	Test Reports N11/4, December 1970 TR 116, October 1973 TR 222, June 1975 See also: Test

SER ITEM

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

A: 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 3P '972. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

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

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

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 # - or Operator's (Upper containment)	Limitorque	SHB	Temp: 180 F Press: 14.8 psig RH: 100% Rad: $1.2 \times 10^{-8}$ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 340 F Press: 105 psig RH: 100% Rad: $2 \times 10^4$ Chem Spray: Boric acid and sodium hydroxide soln.	5 min (Notes 8 and 9)	30 days post DBE	N/A	N/A	Limitorque Test Report: 80058 January 11, 1980 Method: Test

SER ITEM

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

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

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: 3,000 ppm Boron, 10.5 pH

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

Page 11  
Revision 1

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)	Valcor	V526 V573	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $7.5 \times 10^7 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 346 F Press: 113 psig RH: 100% Rad: $2 \times 10^8 R$ Chem Spray: Boric acid and sodium hydroxide soln.	Operate upon receipt of a safety signal	31 days post OBE	N/A	N/A	Test Reports QR-52600-515 and QR-57300-5220-1-1 October 31, 1977 May 15, 1979 Method: Test

SER ITEM

QT, M: The actual qualification test duration is 31 days post-DBE which adequately exceeds the required operating time.

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

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

McGUIRE NUCLEAR STATION - UNIT 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

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)
Containment Air Return Isolation Upper Motor (Upper containment)	Rotork	T1NA21	Temp: 140 F Press: 14.8 psig RH: 100% Rad: $8.1 \times 10^{-5} R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 340 F Press: 75 psig RH: 100% Rad: $2 \times 10^{-8} R$ Chem Spray: Boric acid and sodium hydroxide soln.	5 min (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 Boron  
 4.0 - 4.7 pH  
 Recirculated Spray: 1800-2200 ppm Boron  
 6.0 - 10.0 pH

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

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

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

McGUIRE NUCLEAR STATION - UNIT 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

Page 13  
 Revision 1

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)	Asco	NPB316E34E NPB316E36E	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $7.5 \times 10^{-7}$ R Chem Spray: N/A	Temp: 346 F Press: 110 psig RH: 100% Rad: $1.1 \times 10^{-6}$ R Chem Spray: Boric acid and sodium hydroxide soln.	Operate upon receipt of safety signal	30 days post DBE	N/A	N/A	Test Report AQ52167B/TR 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: 3000 ppm Boron, 9.5 - 10.5 pH

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

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

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

Page 14  
Revision 1

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 psig RH: 100% Rad: $5.7 \times 10^7 R$ Chem Spray: Boric acid $\gamma$ -1 sodium tetrab. ate soln.	Temp: 385 F Press: 66 psig RH: 100% Rad: $1.3 \times 10^8 R$ Chem Spray: Boric acid and hydrozine	(Note 10)	14 days post DBE	N/A	N/A	Test Report 2375, 9/26/79 Method: Test

SER (LEM)

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 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 generic discussion of SER Text Paragraph 3.7, Aging.
- M: The Target Rock solenoid valves 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 valves are only required to operate within the first few days of the accident. The need for venting non-condensable gases is not anticipated beyond the 14 day qualification of the valves.

MCUIRE NUCLEAR STATION - UNIT 2  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

Page 15  
 Revision 1

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)
Differential Pressure Switch for Damper Control (upper containment)	Solon	7PSIADW	Temp: 140 F Press: 14.8 psig RH: 100% Rad: $8.1 \times 10^5 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 150 F Press: 15 psig RH: 100% Rad: $2.1 \times 10^6 R$ Chem Spray: Boric acid and sodium tetraborate soln.	1 min post DBE	5 min post DBE	$\pm 0.5$ psig	$\pm 0.3$ psig	Test Report A293-80 Test Report A296-80 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 year normal life plus the accident environment. Additionally, refer to the generic discussion of SER Text Paragraph 3.7, Aging.

M : Within 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.

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

Page 16  
Revision 1

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 Spec)	ACCURACY DEMONSTRATED (% of Spec)	QUALIFICATION REPORT AND METHOD (4)
Electrical Penetrations (Lower containment)	D. G. O'Brien	Types A, B, C, D, E, F, G, H, J, K, L, M, and cathodic protection penetration (Note 11)	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $8.5 \times 10^{-7}$ R Chem Spray: Boric acid and sodium tetraborate soln. (Note 12)	Temp: 340 F Press: 15 psig RH: 100% Rad: $2 \times 10^{-8}$ R Chem Spray: Boric acid and sodium hydroxide soln.	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 grommets which relate to the failure mechanism. Second, an environmental 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.



McGUIRE NUCLEAR STATION - UNIT 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

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)
Cable - Control, Instrumentation, and 2 KV power (Lower containment)	Okonite	EP Insulation	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $6.7 \times 10^7 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 345 F Press: 104 psig RH: 100% Rad: $2 \times 10^8 R$ Chem Spray: Boric acid and sodium hydroxide soln.	30 days post DBE	130 days post DBE	N/A	N/A	Test Reports FN-1, M-1, G-3, 110E, and 14I 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: 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.

McGUIRE NUCLEAR STATION - UNIT 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

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)
Cable - Instrumentation (lower containment)	Okonite	Tefzel 280 Insulation	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $8.5 \times 10^{-7}$ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 341 F Press: 112 psig. RH: 100% Rad: $2 \times 10^{-8}$ R Chem Spray: Boric acid and sodium hydroxide soln.	4 months post DUE	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 paragraph 3.7, Aging.

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

Test Spray: 3,000 ppm Boron, 10.5 pH

McGUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED INSIDE CONTAINMENT

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)
Cable - Control and 2KV power (Lower containment)	Anacoda	FP Insulation and FP/Hypalon Insulation	Temp: 327 F Press: 14.8 psig RH: 100% Rad: 9x10 <sup>7</sup> R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 346 F Press: 113 psig RH: 100% Rad: 2x10 <sup>8</sup> R Chem Spray: Boric acid and sodium hydroxide soln.	3 months post DBE	4 months post DBE	N/A	N/A	Test Reports I-C-4350-2 and I-C-4350-3, 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

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. Stosson, NRC-EQB, 7-8-81.





McGUIRE NUCLEAR STATION - UNIT 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

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)
Cable Termination/Splice Material (Lower Containment)	Raychem	WCSE-N Sleeves and Breakouts	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $8.5 \times 10^7 R$ Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 357 F Press: 70 psig RH: 100% Rad: $2 \times 10^8 R$ Chem Spray: Boric acid 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

SEI 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 : Initial Spray: 2000-2100 ppm Boron 4.0 - 4.7 pH      Recirculated Spray: 1800-2200 ppm Boron 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 SEI Text Paragraph 3.7, Aging.







McGUIRE NUCLEAR STATION - UNIT 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

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)
Containment Radiation Monitors-High Range (Lower Containment)	General Atomic	RD-23 Ionization Chamber	Temp: 240 F Press: 14.8 psig RH: 100% Rad: $8 \times 10^7$ R Chem Spray: Boric acid and sodium tetraborate soln.	Temp: 315 F Press: 70 psig RH: 100% Rad: Note 17 Chem Spray: Boric acid, sodium thio-sulfate and sodium hydroxide	2 weeks post LOCA	18 days post LOCA	NOTE 20	NOTE 20	Test Report: E-254-960 dated May 1, 1981 Method: Test/Analysis
Cable for Containment Radiation Monitors-High Range (Lower Containment)	Rockbestos	RSS-6-104	Temp: 240 F Press: 14.8 psig RH: 100% Rad: $8 \times 10^7$ R Chem Spray: Note 16	Temp: 315 F Press: 70 psig RH: 100% Rad: $2 \times 10^8$ R Chem Spray: Boric acid, sodium thio-sulfate and sodium hydroxide	2 weeks post LOCA	395 days post LOCA	N/A	N/A	Test Report: E-254-960 dated May 1, 1981 (Note 18) Method: Test

SER Item

NOTE: This equipment is being installed per NRC requirements stated in NUREG 0737.

Q : 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 Boron  
 4.0 - 4.7 pH  
 Recirculated Spray: 1800-2200 ppm Boron  
 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.

McGUIRE NUCLEAR STATION - UNIT 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED INSIDE CONTAINMENT

Page 26  
 Revision 0

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)
Safety Valve Position Indication-Acoustic Monitors (Lower Containment)	TEC	914	Temp: 327 F Press: 14.8 psig RH: 100% Rad: $8 \times 10^2$ R Chem Spray: boric acid and sodium tetraborate soln.	Note 19	2 weeks post DBE	Note 19	N/A	N/A	Note 19

SER Item

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

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 hydrogen recombiner, containment air return fan motors; hydrogen skimmer fan motors, containment air return isolation damper motors, differential pressure switches for damper control and cables associated with these devices which are located in the upper compartment.

Note 2

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

Temperature (Upper Compartment): 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 Air Return Fan Motors (by Duke)
- Hydrogen Skimmer Fan Motors (by Duke)
- Solenoid Operaters-Valcor (by Duke)
- Electric Penetrations (by Duke)
- Cable Termination/Splice Material (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 original Lot 2 report noted an error of +7.3 %<sup>b,c,e</sup> early in the steam test transient. Additional tests were performed on the same unit using water as the process medium instead of nitrogen<sup>b,c,e</sup>; This caused the temperature of the strain gage to track the temperature of the circuit board<sup>b,c,e</sup> more closely during the first minute and limited the positive error to less than 4 %<sup>b,c,e</sup>. In other words, the temperature difference between the strain gage and the circuit board<sup>b,c,e</sup> has been reduced to a level compatible to McGuire Unit 1 functional requirements.

Note 6

Deleted

Note 7

Deleted

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.

Note 10

The Target Rock solenoid valves 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 valves are only required to operate within the first few days of the accident. The need for venting non-condensable gases is not anticipated beyond the 14 day qualification of the valves.

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 impingement 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 16

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 higher 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. Overall 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

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

Page 1  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (T10) (2)	RADIATION LEVEL TO WHICH QUALIFIED (T10)	QUALIFICATION REPORT AND METHOD
Current/Voltage Alarm	Rochester Instruments	ET1215	< 1x10 <sup>3</sup> R (worst case)	Note 1	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).



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

Page 2  
 Revision U

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Fuse	Busmann	FNA	1.6x10 <sup>6</sup> 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 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.

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

Page 3  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATED RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Fuse	Bussman	KTK	$< 1 \times 10^3$ R (worst case)	Note 1	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).

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

Page 4  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (T10) (2)	RADIATION LEVEL TO WHICH QUALIFIED (T10)	QUALIFICATION REPORT AND METHOD
Fuse block	Bussmann	3792	1.6x10 <sup>6</sup> R (worst case)	1x10 <sup>10</sup> R	Memo to File: MC-1362.G3 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.

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Fuse block	Bussmann	3839	$< 1 \times 10^3 R$ (worst case)	Note 1	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 Auxillary 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).

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Fuse block	Bussmann	4439	1.1x10 <sup>3</sup> R (worst case)	1x10 <sup>10</sup> R	Memo to File: MC-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.

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

Page 7  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (T.D)	QUALIFICATION REPORT AND METHOD
Fuse block	Bussmann	4575	$1 \times 10^6 R$ (worst case)	$1 \times 10^{10} R$	Memo to File: MC-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.

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Indicating Light	Cutler-Hammer	E29	5x10 <sup>6</sup> 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 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.

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

Page 9  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Optical Isolator	E-Max	1750123	<1x10 <sup>3</sup> R (worst case)	Note 1	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).



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

Page 10  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Power Supply	Lambda	LCS	$<1 \times 10^3 R$ (worst case)	Note 1	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).

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (T1D) (2)	RADIATION LEVEL TO WHICH QUALIFIED (T1D)	QUALIFICATION REPORT AND METHOD
Relay	Cutler-Hammer	D23	1x10 <sup>6</sup> 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, 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 significant 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.

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (110) (2)	RADIATION LEVEL TO WHICH QUALIFIED (110)	QUALIFICATION REPORT AND METHOD
ReLay	Cutler-Hammer	026	2.4x10 <sup>7</sup> 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 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 SEK Text Paragraph 3.7, Aging.

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

Page 13  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Relay	Struthers-Dunn	219	<1x10 <sup>3</sup> R (worst case)	Note 1	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).

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

Page 14  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Relay	Agostat	7000 Series	< 1x10 <sup>3</sup> R (worst case)	Note 1	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).

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

Page 15  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	QUALIFICATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Resistor	Ghalte	Brown Devil	<1x10 <sup>3</sup> R (worst case)	Note 1	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).

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

Page 16  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
surge suppressor	General Semiconductor	Transzorb	1.6x10 <sup>6</sup> R (worst case)	2x10 <sup>7</sup> R	Manufacturer's Specification data Std. Stk. #111-C-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 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.

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (T10) (2)	RADIATION LEVEL TO WHICH QUALIFIED (T10)	QUALIFICATION REPORT AND METHOD
Switch and Indicating Light	Cutler-Hammer	E30	1.7x10 <sup>-5</sup> (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 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.



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

Page 18  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Switch and Indicating Light	Cutler-Hammer	10250T	5x10 <sup>5</sup> 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 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.

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

Page 19  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Terminal Block	States	ZWH	$2.4 \times 10^7 R$ (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 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.

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

Page 20  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Terminal Block	Buchanan	SOLID LINK SS & TS	$< 1 \times 10^3 R$ (worst case)	Note 1	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).

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Three-Way Solenoid Valve	Powers	265-0002	$5 \times 10^5$ RAD	(Note 7)	(Note 7)

SER ITEM

- R, Q1: The radiation qualification test program is currently in progress. The expected completion date for the test program is January, 1982. 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.

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

Page 22  
 Revision 0

EQUIPMENT IDENTIFICATION (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:	Farr Co.		$3 \times 10^7$ RAD	(Note 6)	(Note 6)

SER ITEM

R, Q1: 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.

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

Page 23  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
ADFU Allison Control Panel-Limiting Component:	Allison	(Note 6)	$3 \times 10^7$ RAD	(Note 6)	(Note 6)

SER ITEM

R, Q1: 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.

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (T10) (2)	RADIATION LEVEL TO WHICH QUALIFIED (T10)	QUALIFICATION REPORT AND METHOD
Proportional Temperature Controller	Love Controls	54, 814, 838, 8134, 8160, 8165, 8173 and 8174	$2 \times 10^4$ RAD	(Note 7)	(Note 7)

SER ITEM

R, Q1: The radiation qualification test program is currently in progress. The expected completion date for the test program is January, 1982. 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.

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (T10) (2)	RADIATION LEVEL TO WHICH QUALIFIED (T10)	QUALIFICATION REPORT AND METHOD
High Temperature Detection Thermostat	United Electric	8006-6CS	$5 \times 10^5$ RAD	(Note 7)	(Note 7)

SER ITEM

R, Q1: The radiation qualification test program is currently in progress. The expected completion date for the test program is January, 1982. 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.



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

Page 26  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (T10) (2)	RADIATION LEVEL TO WHICH QUALIFIED (T10)	QUALIFICATION REPORT AND METHOD
Resistance Temperature Detector	Weed	101-1.2N-A-3-C-6-2-1	$2 \times 10^4$ RAD	(Note 7)	(Note 7)

SER ITEM

R, Q1: The radiation qualification test program is currently in progress. The expected completion date for the test program is January, 1982. 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.

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

Page 27  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (T10) (2)	RADIATION LEVEL TO WHICH QUALIFIED (T10)	QUALIFICATION REPORT AND METHOD
Differential Pressure Switch	Solon	7PS10M	5.2x10 <sup>5</sup> RAD	(Note 7)	(Note 7)

SER ITEM

R, Q1: The radiation qualification test program is currently in progress. The expected completion date for the test program is January, 1982. 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.

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

Page 28  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Differential Pressure Switch	Solon	7PSIADM	5x10 <sup>5</sup> RAD	(Note 7)	(Note 7)

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 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.

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

Page 29  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Diesel Batteries Worst Case: 1EDGB	Nife	HIP-4	$5 \times 10^3$ 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 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E 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 IB motors	Westinghouse, Buffalo	71F13494-1S72, 71F13494-2S72 71F13495-1S72, 71F13495-2S72 (Note 3)	$5.2 \times 10^5$ RAD	$2 \times 10^8$ RAD	WCAP 8754 Rev 1 WCAP 7829 Method: Test and Analysis

SER ITEM

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

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

Page 31  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
RRR and Containment Spray Rooms Sump Pumps 1A and 1B motors	Allis-Chalmers		$9.1 \times 10^4$ RAD	$1 \times 10^5$ RAD	Documentation requested Method: Test

SER ITEM

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

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

Page 32  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Annular Ventilation System Fans 1A and 1B motors	Joy/Relliance	ZYF-273608	$1 \times 10^6$ RAD	$1 \times 10^6$ RAD	Relliance Letter dated 8/3/80

SER ITEM

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

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Auxiliary Building Filtered Exhaust Fans 1A and 1B motor	Alliance	1YF-882612	$5 \times 10^4$ RAD	$2 \times 10^8$ RAD	Alliance Report: NUC-9, 7/1/78 Method: Test and Analysis

SER ITEM

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



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

Page 34  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (Y10) (2)	RADIATION LEVEL TO WHICH QUALIFIED (Y10)	QUALIFICATION REPORT AND METHOD
Diesel Generator Ventilation Fans 1A and 1B motors	Joy/Reliance	1YF-273608	$2 \times 10^4$ RAD	$1 \times 10^6$ RAD	Reliance Letter dated 8/3/80 Method: Test and Analysis

SER ITEM

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

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

Page 35  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
RHR Pump Air Handling Units 1A and 1B motors and CS Pump Air Handling Units 1A and 1B motors	Alliance	2YF-882311	$7 \times 10^5$ RAD	$2 \times 10^8$ RAD	Alliance Report NUC-9, 7/1/78 Method: Test and Analysis

SER ITEM

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

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
500 Volt Load Centers Worst case: IEECD	Gould	K-Line	$6 \times 10^4$ RAD	$1 \times 10^5$ RAD	Report GM-302-618 (Note 4)

SER ITEM

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

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Motor Control Centers Worst case: 1EMXB4 and 1EMXB5	Nelson Electric	Class 103SU	$6 \times 10^3$ RAD	$1 \times 10^5$ RAD	Nelson Electric letter 6/27/84 Method: Test and Analysis

SER ITEM

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

MCQUIRE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E 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
Potential Transformers, RCP Switchgear	Westinghouse	PTH 75	$4 \times 10^4$ RAD	$4 \times 10^6$ RAD	Westinghouse Transformer Div. Report 11/11/77, Life Statement 11/14/77 Method: Test and Analysis

SER ITEM

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

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

Page 39  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Motor Operated Dampers	Rotork	7A, 3MW	$3 \times 10^7$ RAD (worst case)	$3 \times 10^7$ RAD	Rotork Test Reports N11/4, dated 12/70 and TR-116, dated 10/73  Method: By similarity to Rotork NA2 Operator

SER ITEM

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

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

Page 40  
 Revision 0

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Limit Switch	Micro Switch	LSM4M	$1 \times 10^6$ RAD	$1.2 \times 10^8$ RAD	Micro Switch Report LTR # 15027-1

SER ITEM

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

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

EQUIPMENT IDENTIFICATION (1)	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	RECIRCULATION RADIATION ENVIRONMENT (TID) (2)	RADIATION LEVEL TO WHICH QUALIFIED (TID)	QUALIFICATION REPORT AND METHOD
Containment Sump Level Transmitters	Barton	386A	4.1x10 <sup>7</sup> RAD	2x10 <sup>8</sup> RAD	Test Report 43904-1 Method: Test

SER ITEM

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



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 1E equipment that is exposed to the post-LOCA recirculation radiation environment has been evaluated for proper radiation qualification and is included in this table if it is exposed to a total integrated dose equal to or greater than  $1 \times 10^3$  RAD. A total integrated dose (i.e., forty year normal plus one year accident radiation dose) of less than  $1 \times 10^3$  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  $1 \times 10^4$  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 1E EQUIPMENT  
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

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

Page 1  
Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Centrifugal Charging Pump 1A and 1B Motors	Westinghouse, Buffalo	72F44587-1573 72F44587-2573 72F44587-3573 72F44587-4573 (Note 3)	Temp: 212 F	Temp: 212 F	Continuous	Continuous	NA	NA	WCAP B754 and Duke analyses on Westinghouse 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 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 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Component Cooling Pump 1A1, 1A2, 1B1 and 1B2 Motors	Westinghouse, Buffalo	72F44689-1S74 72F44689-2S74 72F44689-3S74 72F44689-4S74 72F44690-1S74 72F44690-2S74 72F44690-3S74 72F44690-4S74 (Note 3)	Temp: 212 F	Temp: 212 F	Continuous	Continuous	NA	NA	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.
- Q: 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.

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

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Nuclear Service Water Pump 1A and 1B Motors	Westinghouse, Buffalo	72F36530-1575 72F36531-1575 72L10936-1575 72L10937-1575 (Note 3)	Temp: 212 F	Temp: 212 F	Continuous	Continuous	NA	NA	WCAP 8754 and Duke analyses on Westinghouse 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.

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

Page 4  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Safety Injection Pump 1A and 1B Motors	Westinghouse, Buffalo	73F69618-1S75 73F69618-2S75 73F69618-3S75 73F69618-4S75 (Note 3)	Temp: 212 F	Temp: 212 F	Continuous	Continuous	NA	NA	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 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 1  
 SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Spent Fuel Cooling Pump IA and IB Motors	Westinghouse, Buffalo	72F44649-1S74 72F44649-2S74 72F44650-1S76 72F44650-2S76 (Note 3)	Temp: 132.4 F	Temp: 145 F	Continuous	Continuous	NA	NA	WEAP 8754, and Duke analysis on Westinghouse testing: MCC 781.05-00-0101 Method: Test and Analysis

SER ITEM

- 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 impingement resulting from a break. Therefore, pressure is not a factor in the qualification of these motors.

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

Page 6  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Fuel Pool Air Handling Unit	Reilance	3YF-882311	Temp: 132.4 F	Temp: 150 F	Continuous	Continuous	NA	NA	M L Ward Letter to file MCH 1320.00 dated 7/17/80 Method: Analysis

SER ITEM

- 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 impingement resulting from a break. Therefore, pressure is not a factor in the qualification of these motors.



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

Page 7  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Current/Voltage Alarm	RIS	ET1215	Temp: 132.4 F (worst case)	Temp: 140 F	Continuous	Continuous	±2.5% of span	± 0.5% of span	Manufacturer's specification data Std. Stk. V-A-4 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.
- 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 1E EQUIPMENT  
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

Page 8  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Fuse	Bussmann	FNA	Temp: 212 F (worst case)	Temp: 212 F	Continuous	Continuous	N/A	N/A	Derated per manufacturer's curve Std. 5tk. #1:1-A-4 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.
- 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 1E EQUIPMENT  
 LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

Page 9  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Fuse	Bussmann	KTK	Temp: 212 F (worst case)	Temp: 212 F	Continuous	Continuous	N/A	N/A	Derate per manufacturer's curve Std. Std. #III-A-4 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.

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

Page 10  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB 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 Manufacturing 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.

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

Page 11  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
o block	Bussmann	3839	Temp: 212 F (worst case)	Temp: 250 F	Continuous	Continuous	N/A	N/A	Bussmann Manufacturing 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.

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

Page 12  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Fusa block	Bussmann	4439	Temp: 212 F (worst case)	Temp: 250 F	Continuous	Continuous	N/A	N/A	Bussmann Manufacturing 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.

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

Page 13  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Fuse block	Bussmann	4575	Temp: 212 F (worst case)	Temp: 250 F	Continuous	Continuous	N/A	N/A	Bussmann Manufacturing report dated 7/24/80 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.

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

Page 14  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Indicating Light	Cutler-Hammer	E29	Temp: 240 F (worst case)	Temp: 255 F	Continuous	Continuous	N/A	N/A	Duke Steag: Production Qualification & Test Facility Report 1R-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.



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

Page 15  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Optical Isolator	E-Max	1750123	Temp: 132.4 F (worst case)	Temp: 140 F	Continuous	Continuous	± 0.5% of span	± 0.5% of span	Specified in Manuals CNM-1338.03-002 CNM-1338.00-003 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.

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

Page 16  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Power Supply	Lambda	LCS	Temp: 132.4 F (worst case)	Temp: 160 F	Continuous	Continuous	±10% regulation of output voltage	±1% regulation of output voltage	Manufacturer's specification data Std. SK, PV11-5-1 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 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 1E EQUIPMENT  
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

Page 17  
Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Relay	Cutler-Hammer	023	Temp: 240 F (worst case)	Temp: 255 F	Continuous	Continuous	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.

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

Page 18  
Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Relay	Cutler-Hammer	D26	Temp: 240 F (worst case)	Temp: 255 F	Continuous	Continuous	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.

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

Page 19  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Relay	Struthers-Dunn	219	Temp: 212 F (worst case)	Temp: 222 F	Continuous	Continuous	N/A	N/A	McGuire Nuclear Station Pipe Rupture Temperature Component Test File: GS-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.

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.

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

Page 20  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Relay	Agostat	7000 Series	Temp: 130 F (worst case)	Temp: 165 F	Continuous	Continuous	N/A	N/A	Agostat specification data Std. Std. VII-C-5 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 break environment.

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

Page 21  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Resistor	Ohmite	Brown Devil	Temp: 132.4 F (worst case)	Temp: 140 F	Continuous	Continuous	± 3% of resistor value	±1% of resistor value (Based on the temperature coefficient and a 70°F shift in the environmental temp.)	Derated per manufacturer's curves Std. 51k, 1X-B-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 break environment.

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

Page 22  
Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Surge Suppressor	General Semi-conductor	Transzorb	Temp: 212 F (worst case)	Temp: 302 F	Continuous	Continuous	N/A	N/A	Duke Material/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 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.



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

Page 23  
 Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Switch and indicating light	Cutler-Hammer	E30	Temp: 212 F (worst case)	Temp: 255 F	Continuous	Continuous	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

- 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 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.

DUKE NUCLEAR STATION - UNIT 1  
SUMMARY OF ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HFLB ENVIRONMENT

Page 24  
Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Switch	Cutler-Hammer	10250T	Temp: 240 F (worst case)	Temp: 255 F	Continuous	Continuous	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.

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

Page 25  
Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT A <sup>10</sup> METHOD
Terminal Block	States	ZWM	Temp: 240 F (worst case)	Temp: 346 F	Continuous	Continuous	N/A	N/A	Duke Steam Production Qualification 5 Test Facility Report 18-025 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<sup>®</sup> the components specific design capabilities.

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

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Terminal Block	Buchanan	Solid Link SS & TS	Temp: 132.4 F (worst case)	Temp: 302 F	Continuous	Continuous	N/A	N/A	Buchanan Specification data Std. Sk. IV-B-2 & IV-B-3 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.
- 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.

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

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Valve Solenoid Operators	Asco	NP 8316E36E	Temp: 330 F	Temp: 346 F	Continuous	Continuous	NA	NA	Test Report: AQS21678/TR Method: Test

SER ITEM

QT: For Operability Required stated as "Continuous", the valve solenoid operator is to be functional continuously for the short-term duration of the pipe break environment (See Note 2). For Operability Demonstrated stated as "Continuous", the valve operator has been determined to be capable of performing its function for the short-term duration of the pipe break environment.

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

P: 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 a factor in the qualification of these valve 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 was qualified by test as noted in the table above.

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

Page 28  
Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Valve Motor Operators	Limiterorque	SMB Order Numbers: 375826-A, 375834-A 375829-A, 375835-A 375831-A, 379664-B 375832-A, 379857-A 375833-A	Temp: 212 F	Temp: 250 F	Continuous	Continuous	NA	NA	Limiterorque Test Report: 80058, 1/11/80  Method: Test
		SMB Order Numbers: 383584-A and 391179-A	Temp: 212 F	Temp: 340 F	Continuous	Continuous	NA	NA	Limiterorque Test Report: 80058, 1/11/80  Method:

SER ITEM

- H: These valve motor operators have been qualified by test for operation in a 100% relative humidity environment.
- P: 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 a factor in the qualification of these valve 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 was qualified by test as noted in the table above.

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

Page 29  
Revision 0

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Valve Motor Operators	Rotork	7NA2 30NA2 11NA2 40NA2 14NA2 70NA2 16NA2 90NA2	Temp: 212 F	Temp: 163 F (Note 4)	Continuous	Continuous	NA	NA	Rotork Test Reports: N11/4, December 1970 TR116, October 1973 TR222, June 1975 TR3025, April 1980  Method: Test
		7NA1 30NA1 11NA1 40NA1 14NA1 70NA1 16NA1 90NA1	Temp: 212 F	Temp: 340 F	Continuous	Continuous	NA	NA	Rotork Test Reports: N11/4, December 1970 TR116, October 1973 TR222, June 1975  Method: Test

SER ITEM

- H: These valve motor operators have been qualified by test for operation in a 100% relative humidity environment.
- P: 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 a factor in the qualification of these valve 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 was qualified by test as noted in the table above.

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

EQUIPMENT IDENTIFICATION	MANUFACTURER	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 METHOD
Stem Mounted Limit Switches	NAMCO	EA-170-302	Temp: 212 F	Temp: 248 F	Continuous	Continuous	NA	NA	NAMCO Test Report for EA-170-302 dated 3/28/80 Method: Test

SER ITEM

- T: The temperature 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.
- Q: This equipment was qualified by test as noted in the table above.



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

EQUIPMENT IDENTIFICATION	MANUFACTURER	MODEL OR IDENTIFICATION NUMBER	HEL B ENVIRONMENT (1)	ENVIRONMENT TO WHICH QUALIFIED	OPERABILITY REQUIRED IN HELB ENVIRONMENT (2)	OPERABILITY DEMONSTRATED	ACCURACY REQUIRED	ACCURACY DEMONSTRATED	QUALIFICATION REPORT AND METHOD
Limit Switch	NAMCO	EA180 EA740	Temp. 212 F	Temp. 340 F	Continuous	Continuous	NA	NA	NAMCO Test Reports dates 3/3/78 & 2/20/78 Method: Test

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

McGUIRE NUCLEAR STATION UNIT 1

ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT  
LOCATED OUTSIDE CONTAINMENT AND EXPOSED TO HELB ENVIRONMENT

Note 1

The methods employed to evaluate pipebreaks and to determine 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.