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March 12, 1985
RBG- 20,386
File Nos. G9.5, G9.19.2,
G9.20.8

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

Dear Mr. Denton:

River Bend Station - Unit 1
Docket No. 50-458

In Gulf States Utilities Company's (GSU) February 15, 1985 submittal, the third attachment was inadvertently omitted from the docket. Please find enclosed the River Bend Station Justification's for Interim Operation (JIO's) on Class 1E electrical components located in a harsh environment for which qualification is not complete.

Sincerely,

Jon Enclos for

J. E. Booker
Manager-Engineering,
Nuclear Fuels & Licensing
River Bend Nuclear Group

JEB/RJK/je

Attachment

A048
1/40

SRN No. 221512-1
Rev. 0
Date 02/08/85

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Leakage control system air compressor motor manufactured by Reliance.

EQUIPMENT IDENTIFICATION NO.(S):

1LSV*C3A
1LSV*C3B

SAFETY FUNCTION:

To ensure containment pressure boundary integrity through pressurizing main steam piping to effect isolation of containment, supplying air to valve seats to prelude leakage from containment, and supplying air to safety relief valves and automatic depressurization system.

QUALIFICATION HISTORY:

Reliance motors were tested (NUC-9 motorettes and NUC-22 complete motor assembly) in accordance with IEEE 334-1974 and met all requirements for operation under normal and abnormal conditions for the River Bend Station (RBS).

TECHNICAL JUSTIFICATION:

Operation under accident conditions (135°F, 2.1 psig) is well within the capability of these motors. In accordance with a telephone conversation with Reliance, motor drains are installed on both ends of the motor to permit rapid equalization of pressure changes, and the specified change will not affect motor performance or integrity. Reliance will formally provide this information. The insulation system is rated Class H (180°C continuous operation) and with a measured internal temperature rise of 80°C. The motor insulation system is well within its temperature rating at RBS

accident conditions. To complete qualification, bearing temperature and motor acceleration time at 70-percent voltage will be provided. The compressor motor starts when air tank pressure drops below 100 psig (minimum). It remains unloaded due to unloading valve action until it accelerates sufficiently to produce a pressure greater than 100 psig. Additionally, as the motor begins to accelerate and starting currents decrease, the terminal voltage will continue to increase, enabling the motors to accelerate more rapidly.

A Reliance representative has committed to provide bearing temperature data and acceleration time for 70-percent voltage.

SCHEDULE COMPLETION DATE:

May 1985

CONCLUSION:

This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Fuel pool cooling pump motor

EQUIPMENT IDENTIFICATION NO.(S):

1SFC*P1A
1SFC*P1B

SAFETY FUNCTION:

Provide cooling for spent fuel stored in the spent fuel pool in the fuel building or in the containment fuel storage pool.

QUALIFICATION HISTORY:

Reliance motors were tested (NUC-9 motorettes and NUC-22 complete motor assembly) in accordance with IEEE 334-1974 and met the requirements for operation under normal conditions for the River Bend Station (RBS). Reliance will provide a certification (NUC-14) that these motors are constructed and covered by the above-mentioned reports and will provide additional documentation to complete qualification as described in the Technical Justification section below.

TECHNICAL JUSTIFICATION:

Operation under abnormal and accident temperature (54.4°C) is within the nameplate rating of the motors (65°C). The insulation system is Class H (180°C continuous operation) and with a measured internal heat rise of 120°C. The motor insulation temperature is below its rating at RBS conditions. To complete qualification, bearing temperatures, bearing life, and motor acceleration time of 70-percent voltage will be provided. Reliance has provided the

torque-versus-speed curves for 70-percent voltage, which demonstrates the ability of the motors to start during this condition. Additionally, these motors are controlled manually, and the operator can ensure that the condition is satisfactory for starting the motors should any problems arise.

A Reliance representative has committed to provide bearing temperature, bearing life, and acceleration time for 70-percent voltage.

SCHEDULE COMPLETION DATE:

May 1985

CONCLUSION:

This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Motor-operated valves with Limitorque Type SMC operators furnished with Paramount make ac Class B motors

EQUIPMENT IDENTIFICATION NO.(S):

1B21*MOV27A	1LSV*MOV15A	1LSV*MOV11A	1LSV*MOV13A
1B21*MOV27B	1LSV*MOV16A	1LSV*MOV11B	1SWP*MOV190
1B21*MOV27C		1LSV*MOV13B	
1B21*MOV27D		1LSV*MOV15B	
		1LSV*MOV16B	

SAFETY FUNCTION:

Valves are normally open; if accident occurs while they are in a closed position, they must cycle open.

Penetration valve - leakage control system. Valves are normally closed (isolation valves) but must open when LSV system is initiated following a LOCA.

QUALIFICATION HISTORY:

The SMC actuator with the Paramount motor is qualified by Report No. B0003 (of overall Report No. B0058). Limitorque contends that operator materials of the SMC are identical to the SMB, which was tested as indicated in Report No. B0003; and the Paramount motor was subjected to the aging parameters, radiation exposure levels, and steam temperature transients indicated in Report No. B0003. Although Limitorque certifies that the Paramount motor successfully completed the testing (testing was done in 1974), Limitorque has not submitted any test data to support its certification of qualification.

TECHNICAL JUSTIFICATION:

During an accident in the auxiliary building, maximum environmental conditions are developed during a high-energy line break (HELB). The valves listed in this JIO are not required to isolate this break and thus are not required to function during this event. Therefore, qualification to maximum temperature conditions is not concurrent with required valve operation. Extreme temperatures/pressures or radiation will not accidently cause the valve to cycle or cause another Class 1E component to fail. This is evident because, other than the actual motor, all operator switch components have been previously qualified by test (motor control centers are also qualified by test). Valves must function during a design basis LOCA, but maximum accident conditions are only 135°F, 100 percent RH, and 2.1 psig, well below the design limits of the Class B insulation system.

The SMC operator component materials have been identified by Limitorque and have been found to be identical to the SMB operator components. These components are qualified directly by Report No. B0003 and include switch material, terminal block material, seals, O-rings, gaskets, wire insulation, and gear box lubricants.

The Class B motor insulation system of the Paramount motor has been identified as the "weak link" component of the motor. A Class B insulation motor must meet minimum thermal endurance standards in accordance with IEEE Standard 1, General Principles for Temperature Limits in the Rating of Electric Equipment. The Class B insulation has a maximum thermal endurance of 130°C (266°F), well above the RB-1 normal service temperatures (50°C ambient plus 50°C motor heat rise plus 10°C hot spot) that will be experienced by the motors in their current locations. The maximum accident temperature in which any of the motors will be energized is 135°F (57°C) with 100 percent humidity, well within thermal endurance limits of the insulation system (57°C + 50°C + 10°C = 117°C). It should also be noted that moderate radiation exposure will have little or no effect on the motor. Radiation testing was performed on a Paramount motor (see Certificate of Compliance from Isomedix, Appendix II of Report No. B0003) to the extent of 204 Mrads gamma. Projected worst-case normal exposure for 7 years is 5.6×10^6, and 180-day accident is 4×10^6, well within radiation endurance levels of the motor. Therefore, it is concluded that the Paramount alternating-current motor with a Class B insulation system is designed and constructed to meet or exceed the environmental service conditions outside of containment in the zones in which they are located.

SCHEDULE COMPLETION DATE:

First fuel outage - approximate date June 1987

CONCLUSION:

Based on the above partial test data and engineering analysis, the actuator will function satisfactorily during normal, accident, and post-accident conditions and is qualified for interim operation until first fuel outage, by which time the motor will be qualified or the operator will be replaced.

This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Standby distribution panelboards 120-V ac

EQUIPMENT IDENTIFICATION NO.(S):

1SCV*PNL: 2A1, 2A2, 2B1, 2B2, 2C1, 2D1, 2E1, 2F1, 2G1, 2H1, 2J1, 2K1, 2L1
1HCS*PNL: 01A2, 01B2

SAFETY FUNCTION:

Provide 120-V ac power to all Class 1E loads as required.

QUALIFICATION HISTORY:

Initial qualification was provided by three reports, 6242.421-264-004A, 6242.421-264-005A, and 6242.421-264-006A, which covered testing and analysis of panelboards, breaker, switches, and wiring. Anomalies in testing were noted, the most serious of which involved opening of certain breakers at ambient temperatures exceeding 140°F. Square D Company has also submitted a report (6242.421-264-005B) giving breaker derating versus increase in ambient temperature.

TECHNICAL JUSTIFICATION:

The maximum River Bend temperature is 140°F during accident conditions. The maximum continuous current in breakers subjected to 140°F temperature is 8 amps continuous (25 amp inrush). Square D Report No. 6242.421-264-005B shows that this type of breaker opened under load at 142.5°F and only when subjected to a current of 64 amps (80 percent rating). Furthermore, this report shows that the breaker did hold continuously at 140°F under a load of 64 amps. In addition,

Report No. 6242.421-264-005A states that this type of breaker can carry 53 amps at 140°F continuously. This data supports the qualification of these breakers under an environmental temperature of 140°F.

A slight pressure transient of 2.1 psig is developed during accident conditions at the River Bend Station. This pressure rises in about 1 minute and returns to atmospheric within 1 day. In light of the construction and operation of the equipment, there is no reason to expect any malfunction due to this low-pressure transient.

During testing, a record was made of 28 anomalies, the most serious of which is described and analyzed above. Many of the remaining anomalies were adjustments to environment, improvements in measurement techniques, handling damage, and occasional lapses in test procedure, such as delayed servicing of chart paper and late actuation of breaker. Further explanations are required for nine anomalies involving confirmation of excess moisture and explanations for miscellaneous breaker problems. From the description provided, it appears that these anomalies are not common mode in nature.

SCHEDULE COMPLETION DATE:

November 1985

CONCLUSION:

The analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Standby 480-V load center

EQUIPMENT IDENTIFICATION NO.(S):

1EJS*LDC2A
1EJS*LDC2B

SAFETY FUNCTION:

To provide low-voltage power to all Class 1E loads, as required.

QUALIFICATION HISTORY:

1500-kVA standby transformers were qualified by Southern Transformer Co. This will be complete upon receipt of Drawing No. 100371 (Appendix 4.09) and accuracy/calibration information on nine pieces of test equipment (Appendix 4.13). Most switchgear items have been qualified by Powell Electrical Manufacturing Co. Seismic and environmental tests and analyses are missing for ITE, Westinghouse, and Agastat relays, which will be furnished by Powell.

TECHNICAL JUSTIFICATION:

Qualification Report SDDF No. 6242.533-265-012A provides qualification for General Electric Co. relays and meters designed for the same conditions as the relays noted above. Report No. RC-5008B, BBC Brown Boveri SDDF No. 6242.533-262-013A has been submitted by Powell, providing Class 1E electrical equipment certification for the ITE 59G ground overvoltage relay which is employed in these load centers.

This certification qualifies the relays for 40-year normal and 100-day post-accident conditions, with the exception of a brief period at the onset of the DBE. In the case of the 59G ground relay, both normal maximum and accident temperatures are below the certified values. The pressure rises to 2.1 psig for approximately 1 minute, whereas the certified value is atmospheric. However, in view of the construction and operation of the relay, there is no reason to expect any malfunction because of this low-pressure increase. Accident humidity in the area rises to 100 percent (no steam), whereas the relay is certified to 95 percent. However, the internal temperature rise within the switchgear of approximately 15°C will lower the humidity within the switchgear to below 95 percent. The total integrated radiation is within the certified value. Although these values are for the 59G ground relay, all other relays in question are designed for the same type of environment. Based on the General Electric Co. report and the low level of environmental stress and brief nature of the accident, it is evident that the relays will perform as required.

SCHEDULE COMPLETION DATE:

November 1985

CONCLUSION:

This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

480-V ac motor control centers (MCCs) manufactured by Gould Inc., Series 5600, and located in the auxiliary building.

EQUIPMENT IDENTIFICATION NO.(S):

1ENS*MCC2A	1ENS*MCC2F
1ENS*MCC2B	1ENS*MCC2G
1ENS*MCC2C	1ENS*MCC2H
1ENS*MCC2D	1ENS*MCC2J
1ENS*MCC2E	1ENS*MCC2K
	1ENS*MCC2L

SAFETY FUNCTION:

Serving Class 1E equipment, such as MOVs, HVAC, control air compressors, and 480/120-V power distribution transformers.

QUALIFICATION HISTORY:

The qualified environmental parameters for the MCCs are: atmospheric pressure, short-term 100-percent humidity, 40°C average ambient, 8.42-yr life for major components, 1×10^6 rads (Gould Type Test Report No. CC-74-67, Revision 3, dated July 20, 1984). These parameters envelop the normal and abnormal operating environmental conditions.

TECHNICAL JUSTIFICATION:

During postulated DBE (high energy line break or moderate energy line crack), the MCCs could be exposed to an accident environmental profile which shows a peak temperature of 145°F at 1500 sec (dropping to 132°F after 6000 sec), accompanied by a peak pressure of 2.1 psig and 100-percent humidity.

To satisfy the qualification requirements, the MCC is to be retested for the above-listed accident conditions. A supplemental test is in progress. A test plan that envelopes the above conditions has been prepared with SWEC concurrence. Previous testing of an MCC by Franklin Research Center to steam conditions was successful. Based on this result, the River Bend MCCs are expected to pass the 145°F, 100-percent relative humidity test.

SCHEDULE COMPLETION DATE:

July 1985

CONCLUSION:

The above analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Sample pump and motor assembly (Thomas and Metal Bellows)

EQUIPMENT IDENTIFICATION NO.(S):

1RMS*RE125
1RMS*REX125

SAFETY FUNCTION:

To draw the sample.

QUALIFICATION HISTORY:

General Atomic Co. (GA) has qualified the motors by considering bearing as a weakest link. From operating experience, a very conservative life of 10,000 hours is assumed for bearing. Motor has to be replaced after 10,000 hours. In addition, GA has gathered operating data for Thomas pump and motor for more than 20,000 hours by running motor continuously at ambient temperature from 17°C to 27°C as documented in GA Drawing No. 281-9050. Test is in progress to extend qualified life of motor at maximum specified temperature of 55°C.

TECHNICAL JUSTIFICATION:

The Thomas sampling pump motor has Class B insulation which consists of 14-mil mylar, polyester with nylon overcoat, and crossed-linked polyethylene. The maximum operating temperature during accident is 55°C, and heat rise is 57°C. Therefore, to al winding temperature becomes 112°C, which is well below maximum operating temperature of 130°C of Class B motors. Therefore, Thomas pump motor will work at specified service conditions.

According to Arrhenius data given in qualification reports specified below, the qualified life of insulating system materials to Thomas pump motor is:

1. 6 years at 112°C for mylar from Wyle Report No. 57657.
2. 5 years at 112°C for polyethylene from Wyle Report No. 57657.
3. For polyester with nylon overcoat, nylon has a lower activation energy, and it has 4 years at 112°C from Franklin Report No. F-C4590.

Based on above analysis, GSU has high confidence that Thomas pump motor will work for 10,000 hours. The sampling pump motor of Metal Bellows has Class A insulation, which consists of zytel, nylon over polyurethene, and polyvinyl chloride. The maximum operating temperature during accident is 55°C, and heat rise is 50°C. Therefore, total winding temperature becomes 105°C, which is below maximum operating temperature of 110°C of Class A motors. Therefore, Metal Bellows pump motor will work at specified service conditions.

According to Arrhenius data given in qualification reports specified below, the qualified life of insulation system materials of Metal Bellows pump motor is:

1. 1.2 years at 105°C for zytel from Franklin Report No. F-C4590.
2. For nylon over polyurethene, nylon has a lower activation energy, and it has 4.5 years at 105°C from Franklin Report No. F-C4590.
3. 4 years at 105°C for polyvinyl chloride from Wyle Report No. 57657.

SCHEDULE COMPLETION DATE:

October 1985

CONCLUSION:

This analysis meets the criteria of 10CFR50 49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Sample pump motor assembly (Thomas and Metal Bellows)

EQUIPMENT IDENTIFICATION NO.(S):

1RMS*RE5A
1RMS*REX5A

SAFETY FUNCTION:

To draw the sample.

QUALIFICATION HISTORY:

General Atomic Co. (GA) has qualified the motors by considering bearing as a weakest link. From operating experience, a very conservative life of 10,000 hours is assumed for bearing. Motor has to be replaced after 10,000 hours. In addition, GA has gathered operating data for Thomas pump and motor for more than 20,000 hours by running it continuously at ambient temperature from 17°C to 27°C as documented in GA Drawing No. 281-9050. Test is in progress to extend qualified life of motor at maximum specified temperature of 55°C.

TECHNICAL JUSTIFICATION:

The Thomas sampling pump motor has Class B insulation which consists of 14-mil mylar, polyester with nylon overcoat and crossed-linked polyethylene. The maximum operating temperature during accident is 50°C, and heat rise is 55°C. Therefore, total winding temperature becomes 105°C, which is well below maximum operating temperature of 130°C of Class B motors. Therefore, motors will work at specified service conditions.

According to Arrhenius data given in qualification reports specified below, the qualified life of insulating system materials to Thomas pump motor is:

1. 6 years at 112°C for mylar from Wyle Report No. 57657.
2. 5 years at 112°C for polyethylene from Wyle Report No. 57657.
3. For polyester with nylon overcoat, nylon has a lower activation energy, and it has 4 years at 112°C from Franklin Report No. F-C4590.

Based on the above analysis, GSU has high confidence that Thomas pump motor will work for 10,000 hours. The Metal Bellows sampling pump motor has Class A insulation, which consists of zytel, nylon over polyurethene, and polyvinyl chloride. The maximum operating temperature during accident is 50°C, and heat rise is 50°C. Therefore, total winding temperature becomes 100°C, which is below maximum operating temperature at 110°C of Class A motors. Therefore, motor will work at specified service conditions.

According to Arrhenius data given in qualification reports specified below, the qualified life of insulating system materials of Metal Bellows pump motor is:

1. 1.2 years at 105°C for zytel from Franklin Report No. F-C4590.
2. For nylon over polyurethene, nylon has a lower activation energy, and it has 4.5 years at 105°C from Franklin Report No. F-C4590.
3. 4 years at 105°C for polyvinyl chloride from Wyle Report No. 57657.

SCHEDULE COMPLETION DATE:

October 1985

CONCLUSION:

This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

SRN No. 247250-3
Rev. 0
Date 02/08/85

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Sample pump and motor assembly (Thomas)

EQUIPMENT IDENTIFICATION NO.(S):

1RMS*RE11A
1RMS*RE11B

SAFETY FUNCTION:

To draw the sample.

QUALIFICATION HISTORY:

General Atomic Co. (GA) has qualified the motor by considering bearing as a weakest link. From operating experience, a very conservative life of 10,000 hours is assumed for bearing. Motor has to be replaced after 10,000 hours. In addition, GA has gathered operating data for more than 20,000 hours by running the motor continuously at ambient temperatures from 17°C to 27°C as documented in GA Drawing No. 281-9050. Test is in progress to extend qualified life of motor at maximum specified temperature of 55°C.

TECHNICAL JUSTIFICATION:

The sampling pump motor has Class B insulation which consists of 14-mil mylar, polyester with a nylon overcoat, and crossed-linked polyethylene. The maximum operating temperature during accident is 50°C, and heat rise is 57°C. Therefore, total winding temperature becomes 107°C, which is well below maximum operating temperature of 130°C of Class B motors. Therefore, motor will perform its function for specified condition.

According to Arrhenius data given in qualification reports specified below, the qualified life of insulating system materials is:

1. 6 years at 112°C for mylar from Wyle Report No. 57657
2. 5 years at 112°C for polyethylene from Wyle Report No. 57657
3. For polyester with a nylon overcoat, nylon has a lower activation energy, and it has 4 years at 112°C from Franklin Report No. F-C4590.

SCHEDULE COMPLETION DATE:

October 1985

CONCLUSION:

Based on the above analysis, GSU has high confidence that motor will work for 10,000 hours. This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Sample pump and motor assembly (Thomas)

EQUIPMENT IDENTIFICATION NO.(S):

1RMS*RE111
1RMS*RE112

SAFETY FUNCTION.

To draw the sample.

QUALIFICATION HISTORY:

General Atomic Co. (GA) has qualified the motor by considering bearing as a weakest link. From operating experience, a very conservative life of 10,000 hours is assumed for bearing. Motor has to be replaced after 10,000 hours. In addition, GA has gathered operating data for more than 20,000 hours by running the motor continuously at ambient temperatures from 17°C to 27°C as documented in GA Drawing No. 281-9050. Test is in progress to extend qualified life of motor at maximum specified temperature of 55°C.

TECHNICAL JUSTIFICATION:

The sampling pump motor has Class B insulation which consists of 14-mil mylar, polyester with a nylon overcoat, and crossed-linked polyethylene. The maximum operating temperature is 33°C, and heat rise is 57°C. Therefore, total winding temperature becomes 90°C, which is well below maximum operating temperature of 130°C of Class B motors. Therefore, the motor will perform its function for the specified condition.

According to Arrhenius data given in qualification reports specified below, the qualified life of insulating system materials is:

1. 6 years at 112°C for mylar from Wyle Report No. 57657
2. 5 years at 112°C for polyethylene from Wyle Report No. 57657
3. For polyester with a nylon overcoat, nylon has lower activation energy, and it has 4 years at 112°C from Franklin Report No. F-C4590.

SCHEDULE COMPLETION DATE:

October 1985

CONCLUSION:

Based on the above analysis, GSU has high confidence that the motor will work for 10,000 hours. This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Sample pump of motor assembly (crane)

EQUIPMENT IDENTIFICATION NO.(S):

1RMS*RE15A
1RMS*RE15B

SAFETY FUNCTION:

To draw the sample.

QUALIFICATION HISTORY:

General Atomic Co. (GA) has qualified the motor by considering bearing as the weakest link. From operating experience, a very conservative life of 10,000 hours is assumed for bearing. Motor has to be replaced after 10,000 hours. Test is in progress to determine qualified life of motor at a maximum specified temperature of 55°C.

TECHNICAL JUSTIFICATION:

The sampling pump motor has Class H insulation which consists of polyimide, HT nylon, braided heat-treated fiberglass, teflon, and silicon varnish. The maximum operating temperature is 50°C and heat rise is 55°C. Therefore, total winding temperature becomes 105°C, which is well below maximum operating temperature of 175°C of Class H motors. Therefore, motor will perform its function for a specified condition.

According to Arrhenius data given in qualification reports specified below, the qualified life of insulating system materials is:

1. 5 years at 105°C for polyimide from Franklin Report No. F-C4590
2. 4.5 years at 105°C for nylon from Franklin Report No. F-C4590
3. 4.5 years at 105°C for fiberglass from Wyle Report No. 57657
4. 2.3 years at 105°C for teflon from Franklin Report No. F-C4590
5. 20 years at 105°C for silicon varnish from Wyle Report No. 57657

SCHEDULE COMPLETION DATE:

October 1985

CONCLUSION:

Based on the above analysis, GSU has high confidence that motor will work for 10,000 hours. This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Sample pump and motor assembly

EQUIPMENT IDENTIFICATION NO.(S):

1RMS*RE5B

SAFETY FUNCTION:

To draw the sample

QUALIFICATION HISTORY:

General Atomic Co. (GA) has qualified the motor by considering bearing as a weakest link. From operating experience, a very conservative life of 10,000 hours is assumed for bearing. Motor has to be replaced after 10,000 hours. In addition, GA has gathered operating data for more than 20,000 hours by running the motor continuously at ambient temperature from 17°C to 27°C as documented in GA Drawing No. 281-9050. Test is in progress to extend qualified life of motor at maximum specified temperature of 55°C.

TECHNICAL JUSTIFICATION:

The sampling pump motor has Class B insulation, which consists of 14-mil mylar, polyester with a nylon overcoat, and crossed-linked polyethylene. The maximum operating temperature during accident is 50°C, and heat rise is 57°C. Therefore, total winding temperature becomes 107°C, which is well below maximum operating temperature of 130°C of Class B motors. Therefore, motor will perform its function for the specified condition.

According to Arrhenius data given in qualification reports specified below, the qualified life of insulating system materials is:

1. 6 years at 112°C for mylar from Wyle Report No. 57657
2. 5 years at 112°C for polyethylene from Wyle Report No. 57657
3. For polyester with nylon overcoat, nylon has a lower activation energy, and it has 4 years at 112°C from Franklin Report No. F-C4590.

SCHEDULE COMPLETION DATE:

October 1985

CONCLUSION:

Based on the above analysis, GSU has high confidence that the motor will work for 10,000 hours. This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Thermal flow-detecting elements and associated actuating switches

EQUIPMENT IDENTIFICATION NO.(S):

1GTS*FS24A	1GTS*FE24A
1GTS*FS24B	1GTS*FE24B
1HVF*FS109	1HVF*FE109
1HVF*FS32A	1HVF*FE32A
1HVF*FS32B	1HVF*FE32B
1HVR*FS163	1HVR*FE163
1HVR*FS28A	1HVR*FE28A
1HVR*FS28B	1HVR*FE28B
1HVR*FS28C	1HVR*FE28C
1HVR*FS29A	1HVR*FE29A
1HVR*FS29B	1HVR*FE29B
1HVR*FS56A	1HVR*FE56A
1HVR*FS56B	1HVR*FE56B
1HVR*FS111	1HVR*FE111
1HVR*FS113	1HVR*FE113
1LSV*FS20A	1LSV*FE20A
1LSV*FS20B	1LSV*FE20B

SAFETY FUNCTION:

Detect loss of air flow in safety-related ventilation systems designed to mitigate accident consequences and minimize potential offsite radiation exposure. Upon loss of flow, HVF, HVR, and GTS system switches actuate to start backup fans in order to reestablish air flow.

LSV system flow switches actuate on detection of high leak rates to permit system isolation by motor-operated valves.

QUALIFICATION HISTORY:

Testing has been completed and report submitted, which envelops the River Bend environmental conditions. Repeatability and drift acceptance criteria were exceeded by the test results; additional explanation is required to interpret the test data.

TECHNICAL JUSTIFICATION:

During the qualification testing, an initial limit on drift due to temperature was established. After a meeting with Fluid Components Inc. (FCI) representatives, it was established that this initial drift was the cause of the unacceptable test results. However, since the function of most of these switches (and detecting elements) is the switching on of backup fans upon a loss of air flow, repeatability within a limited range is not essential to proper system operation. Loss of flow will cause the switches to actuate. As air flow decreases, the signal output increases hyperbolically (first quadrant rectangular hyperbola), virtually guaranteeing switch operation. Therefore, an extremely limited range of repeatability and drift is not required.

Operation of the LSV flow switches is analogous. With normal flows at the low end of the scale, a small increase in flow will cause an extremely large change in output. With setpoint drifts as identified in the qualification report, the measured flow will still be in the range of high sensitivity (large output) to flow change ratio, and switch actuation will occur.

The setpoint calculations, which will ensure that the switches are set to effectively utilize this design and maintain system requirements, will be completed by fuel load.

FCI has committed to provide the necessary data to enable us to interpret the test results in accordance with our discussion during our meeting with FCI on February 8, 1985.

SCHEDULE COMPLETION DATE:

May 1985

CONCLUSION:

This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

TYPE/DESCRIPTION:

Electrohydraulic actuators

EQUIPMENT IDENTIFICATION NO.(S):

1E33*PVF002
1E33*PVF022
1LSV*PV10A
1LSV*PV10B

SAFETY FUNCTION:

To control seal air pressure which minimizes the possibility of release of fission products that could leak through the associated penetrations of process lines that penetrate the primary containment and terminate outside the secondary containment.

QUALIFICATION HISTORY:

The electrohydraulic actuators have been tested in accordance with Generic Test Report No. 58801. The unit passed all the tests except LOCA when temperature was 360°F. Pressure was 20 psig with 100-percent steam environment. The cause of the failure was the pressure switch and signal strength associated with it.

TECHNICAL JUSTIFICATION:

As a result of this testing, the pressure switch was analyzed by Borg Warner Inc. and redesigned to allow operation under the expected accident conditions. First, the switch has been sealed to prevent the intrusion of moisture and to

minimize the effects of high temperature and pressure. The electrical circuit was modified to increase its current draw from 10 ma to 30 ma. The added force provided by the increased current will allow the switch to maintain position (or change position) during extreme pressure variations and steam excursions. Additionally, the switch has been tested on the component level to conditions similar to the previous actuator test and has passed the testing. Retesting is in progress to qualify the entire actuator assembly.

SCHEDULE COMPLETION DATE:

November 1985

CONCLUSION:

This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

SRN No. C01
Rev. 0
Date: 02/14/85
Page 1 of 2

TYPE/DESCRIPTION:

MODEL 1152PXK22T0280PB TRANSMITTERS
MANUFACTURED BY ROSEMOUNT, INC.

MPL NUMBER:

See Attachment 1.

SAFETY FUNCTION:

Safeguards actuation.

QUALIFICATION HISTORY:

The qualification test program is being conducted in accordance with the guidelines and test methods described in NEDE-24326-1-P. Acceptance criteria are defined in PPQS 24A1326, 24A1327 and 24A1330. Representative test samples have been subjected to radiation, thermal and operational aging; temperature extremes, dynamic loading, DBE and 50 days of post DBE testing. An additional 60 days of post DBE exposure and testing remain for completion of the test program.

TECHNICAL JUSTIFICATION:

Rosemount 1152-T0280 transmitters have completed the most severe portion of the test program through 50 days of post DBE. The 50 days of DBE/post DBE which envelope the most severe River Bend requirement, exceed the River Bend 100-day profile by a factor of 8 from a thermal degradation aspect using Arrhenius methodology.

SCHEDULE COMPLETION DATE:

May 1985

CONCLUSION:

This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

ATTACHMENT 1

Nuclear Boiler System

B21-N062A B21-N081A
B21-N062B B21-N081B
B21-N068A B21-N081C
B21-N068B B21-N081D
B21-N068E B21-N091A
B21-N068F B21-N091B
B21-N073C B21-N091E
B21-N073G B21-N091F
B21-N073L B21-N094A
B21-N073R B21-N094B
B21-N075A B21-N094E
B21-N075B B21-N094F
B21-N075C B21-N095A
B21-N075D B21-N095B
B21-N076A B33-N014A
B21-N076B B33-N014B
B21-N076C B33-N014C
B21-N076D B33-N014D
B21-N078A B33-N024A
B21-N078B B33-N024B
B21-N078C B33-N024C
B21-N078D B33-N024D
B21-N080A
B21-N080B
B21-N080C
B21-N080D

Reactor Protection System (RPS)

C71-N050A
C71-N050B
C71-N050C
C71-N050D
C71-N052A
C71-N052B
C71-N052C
C71-N052D

Residual Heat Removal **(RHR)** System

E12-N007A
E12-N007B
E12-N015A
E12-N015B
E12-N015C
E12-N052A
E12-N052B
E12-N052C
E12-N055A
E12-N055B
E12-N055C
E12-N056A
E12-N056B
E12-N056C

Low Pressure Core Spray (LPCS) System

E21-N003
E21-N051
E21-N052
E21-N053

High Pressure Core Spray (HPCS) System

E22-N005
E22-N051
E22-N056

Control**Rod Drive Hydraulic** System

C11-N054A
C11-N054A
C11-N054A
C11-N054A

Leak Detection System

E31-N075A
E31-N075B
E31-N076A
E31-N076B
E31-N077A
E31-N077B
E31-N083A
E31-N083B
E31-N084A
E31-N084B
E31-N085A
E31-N085B
E31-N086A
E31-N086B
E31-N086C
E31-N086D
E31-N087A
E31-N087B
E31-N087C
E31-N087D
E31-N088A
E31-N088B
E31-N088C
E31-N088D
E31-N089A
E31-N089B
E31-N089C
E31-N089D

Main Steam Positive Leakage Control System

E33-N001
E33-N002
E33-N003
E33-N004
E33-N005
E33-N007
E33-N021
E33-N022
E33-N023
E33-N024
E33-N025
E33-N027

Reactor Core Isolation Cooling (RCIC) System

E51-N003
E51-N050
E51-N051
E51-N052
E51-N053
E51-N055A
E51-N055B
E51-N055E
E51-N055F
E51-N056A
E51-N056E

RBS - ENVIRONMENTAL QUALIFICATION PROGRAM

JUSTIFICATION FOR INTERIM OPERATION

SRN No. S19
Rev. 0
Date: 02/14/85
Page 1 of 2

TYPE/DESCRIPTION

Crosby Safety Relief Valve (SRV) Solenoid Pilot Valve (SPV)

MPL NUMBER:

B21-F041, F047 and F051 (Main Steam Safety Relief Valves)

SAFETY FUNCTION:

Reactor Pressure Vessel overpressure protection - mitigation of a small break accident (break area less than 0.5 square feet).

QUALIFICATION HISTORY:

Crosby IMF-3 SPV is an upgrade over the IMF-2 presently installed in several operating reactor plants. The IMF-3 environmental qualification test program includes testing in accordance with NEDE-24326-1-P (i.e., radiation, thermal, mechanical/cyclic aging, hydrodynamic/seismic and design basis event testing). This program for the IMF-3 has completed 64 of the 110 days requirement as of 2/8/85 with no failures nor significant anomalies experienced to date. The remaining portion of the test consists of 227°F and 11.2 psig steam continuously.

TECHNICAL JUSTIFICATION:

Successful IMF-3 test completion is expected by 3/26/85. The most severe DBE test portion has been successfully completed. River Bend Station is being furnished with IMF-3A Solenoid Pilot Valves which have an anti-rotational pin installed to improve dynamic capability by eliminating the tendency to flex the electrical wires. Therefore, the IMF-3A Solenoid Pilot Valves used on the main steam safety relief valves are justified for use at River Bend Station.

SCHEDULE COMPLETION DATE:

May 1985

CONCLUSION:

This analysis meets the criteria of 10CFR50.49, paragraph (i)(2). Therefore, interim operation is justified.

IMF-3 SOLENOID PILOT VALVE NUREG-0588 ENVIRONMENTAL QUALIFICATION TEST STATUS

SRN No. S19
Rev. 0
Date: 02/14/85
Page 2 of 2

Event	Test Condition	Status	Results
Receipt Inspection		Complete	Acceptable
Baseline Functional	Room Temperature (R.T.)	Complete	Acceptable
Radiation	6.2×10^7 rads	Complete	Acceptable
Functional Test	Room Temperature (R.T.)	Complete	Acceptable
Thermal Aging	270-275F (500 hrs.)	Complete	Acceptable
Anomaly #1 during thermal aging was excessive leakage past solenoid main seat at high pneumatic (160 psig) pressures (at lower 95 psig pressures, the seats seal properly). The seats are lower in hardness than design causing this characteristic leakage.		Complete (Continue test and leak check at 88-95 psig on main seat.)	Acceptable
Functional Test	Room Temperature (R.T.)	Complete	Acceptable
Mechanical Cycle Aging	Room Temperature to 270°F	Complete	Acceptable
Functional Test	Room Temperature (R.T.)	Complete	Acceptable
Dynamic and Seismic Qual.	Room Temperature on Steam Line	Complete	Acceptable
Functional Test	Room Temperature (R.T.)	Complete	Acceptable
DBE Accident Simulation	355°F to 227°F 35 psig to 11.2 psig	64 days of 110 days	Acceptable and continuing