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April 28, 1983

1CANØ48315

Director of Nuclear Reactor Regulation
ATTN: Mr. J. F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
Environmental Qualification -
Response to Safety Evaluation Report

Gentlemen:

By your letter dated January 26, 1983 (1CNAØ183Ø4), you submitted the ANO-1 Environmental Qualification Safety Evaluation Report (SER) and associated Technical Evaluation Report (TER) prepared by Franklin Research Center (FRC). Our response to your request for justifications for continued operation (JCO) for "category II.B" items was submitted by our letter dated February 28, 1983 (1CANØ28314). We received (on March 29, 1983) your letter dated March 22, 1983 (1CNAØ3831Ø), which provided clarification of the submittal requirements regarding environmental qualification for ANO-1.

In accordance with the clarification letter, the following is AP&L's 30-day response. AP&L has addressed all items listed by Franklin as category I.B, II.A and IV, and have provided JCO's for each item for which a JCO was not previously submitted. In addition, all previously supplied JCO's were reviewed against the Franklin TER, and those which required changes due to Franklin's comments have been revised and are also included with this submittal.

You will notice that many of the JCO's are actually reconfirmation of AP&L's position that the particular device is fully qualified as previously indicated. In each case, we have examined the TER open items and in some instances concluded the FRC concerns are not applicable for the reasons stated in the JCO. In many other cases, we have acknowledged the deficiencies and provided appropriate justifications.

A048
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We feel it is appropriate to inform you of a recent development which may impact our qualification efforts. While in the process of completing the JCO's required by your March 22 letter, AP&L was informed by our subcontractor that a radiation source term was inadvertently omitted from their radiation models, and therefore not considered in the detailed environmental qualification evaluations previously provided. Specifically, the doses due to buildup of Iodines in the Hydrogen Purge System filters and Penetration Room Ventilation System filters had been omitted. We have now evaluated the impact on the devices located in these areas and have reflected the new doses to all affected devices in the appropriate JCO's. Please note that the modeling of the doses is conservative, and AP&L is investigating means by which the doses may be reduced. Should AP&L determine that replacement of any of these devices is expedient, we will make every effort to secure a replacement and install the new device by the next refueling outage; however, should any problems arise, we will inform you immediately and request an extension to the qualification deadline for the affected items.

The SER dated January 26, 1983, identified additional areas requiring attention by AP&L. The SER items and our response are provided below:

1. Item: "Submission of information within thirty (30) days for items in NRC categories 1B, 2A, and 2B...."

   Response: The required information was submitted by our letter dated February 28, 1983 (1CANØ28314) or is attached hereto.

2. Item: "Resolution of deficiencies associated with Equipment Items...Category II.B."

   Response: Our response was submitted on February 28, 1983 (1CANØ28314).

3. Item: "Resolution of the concerns identified in section 4.3.1 of the FRC TER regarding the completeness of the safety-related equipment list."

   Response: FRC did not indicate a specific concern in this matter but only provided the general observation that, "The Licensee has not provided a satisfactory response to the NRC concern." In our previous response, we indicated that qualification of equipment such as display instrumentation would best be addressed through resolution of activities concerning emergency operating procedures, human factors engineering, control room design review, and post-accident monitoring. Since these activities are now integrated under generic letter 82-33, the final results of that effort will determine the appropriate action regarding the need for additional equipment qualification.

4. Item: "Resolution of the concerns identified in section 4.3.2 of the FRC TER regarding the Containment Spray System."

   Response: The Franklin concern stated that the licensee did not verify that, "the Containment Spray System is not subjected to a disabling single-component failure and therefore satisfies section 4.2.1 of the

DOR guidelines." Therefore, we provide the following statement: The Containment Spray System is not subjected to a disabling single-component failure and therefore satisfies section 4.2.1 of the DOR guidelines (Ref: ANO-1 FSAR section 6.2.2.5).

5. Item: "Resolution of the concern identified in section 4.3.3.1 of the FRC TER regarding environmental service conditions. The staff has reviewed this concern and concludes that the containment temperature/pressure profiles...of the FSAR, are acceptable for use in equipment qualification."

   Response: This concern is considered closed since the FSAR profiles accepted by the staff are the basis for the inside containment service conditions established by AP&L for EQ purposes.

6. Item: "Resolution of the staff concern (section 4.3.3.3 of the FRC TER) regarding the treatment of beta radiation doses."

   Response: We have previously provided a separate response to this concern by our letter dated November 12, 1982 (1CAN118204) and references therein. We would point out that your guidance provided in 79-01B (section 4.1.2) was followed concerning beta dose reduction.

A final item relates to a verbal request for information from Mr. Guy Vissing of your staff. Concerning our previous JCO submittal on the category II.B pressure transmitters, AP&L was requested to confirm that procedures would be implemented to ensure that operators would not be misled by errant behavior of the transmitters following the conclusion of their qualified operating time (two hours into the accident). In response to this request, AP&L has reviewed the Emergency Operating Procedures to determine operator actions related to indication received from these transmitters. There are no operator actions keyed by input from these devices; therefore, the potential to mislead or confuse the operators is minimized. The essential functions associated with the devices are automatic engineered safeguards actuation signal and containment spray initiation which are not required after the two-hour time period.

In addition, Mr. Vissing requested that AP&L confirm that Justifications for Interim Operation (JIO's) previously submitted (see AP&L letter ØCANØ28211 dated February 27, 1982) are sufficient to serve as Justifications for Continued Operation (JCO's) until the qualification deadline imposed by the EQ rule. We therefore affirm that previously submitted JIO's are applicable as JCO's until the qualification deadline imposed by the rule. Please note that the terminology has always been used interchangeably by AP&L and no differences were intended between the two.

Very truly yours,

John R. Marshall

John R. Marshall
Manager, Licensing

JRM:CT:sl

ATTACHMENT I

ARKANSAS NUCLEAR ONE

UNIT 1

JUSTIFICATIONS FOR CONTINUED OPERATION FOR ENVIRONMENTAL QUALIFICATION DEFICIENCIES

April 28, 1983

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EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1000

SER RESPONSE PAGE NO(S).: A013

FRC EQUIPMENT ITEM: 14

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-230 Reactor Coolant System

LOCATION: Reactor Building

- SAFETY FUNCTION:

  This valve is the Pressurizer Block Valve which may be required to close upon failure of the electromatic relief valve.

- QUALIFICATION DISCREPANCY:

  According to the Franklin "Technical Evaluation Report" (TER), qualification of this device is deficient in the following areas: Similarity to test specimen not established and aging (qualified life) not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This device has been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device; however, we have obtained information by walkdown (motor manufacturer and insulation class) needed to assure qualification. We are awaiting formal documentation from Limitorque which will confirm the qualification of the motor and officially close this item. The applicable test report is 600198. Once similarity is established, the device satisfies all aging requirements per Limitorque report B0058.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1053

SER RESPONSE PAGE NO(S).: A044

FRC EQUIPMENT ITEM: 1

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-230, Reactor Coolant System

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Reactor Coolant Quench Tank Transfer Line Isolation

- QUALIFICATION DISCREPANCY:

  According to the Franklin "Technical Evaluation Report" (TER), qualification of these devices is deficient in the following areas: Similarity to test specimen not established and aging (qualified life) not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This device has been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device; however, we have obtained information by walkdown (motor manufacturer and insulation class) needed to assure qualification. We are awaiting formal documentation from Limitorque which will confirm the qualification of the motor and officially close this item. The applicable test report is 600198.

  Once similarity is established, the devices satisfy all aging requirement per Limitorque report B0058.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1054

SER RESPONSE PAGE NO(S).: A045

FRC EQUIPMENT ITEM: 5

MANUFACTURER AND MODEL NO.: Limitorque SMB-000-2

SYSTEM - P&ID NO.: Reactor Coolant, M-230

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Isolate Quench Tank Vent Sample Line Upon Receipt of a Safeguards Actuation Signal (Reactor Building Isolation)

- QUALIFICATION DISCREPANCY:

  All Items

- JUSTIFICATION FOR CONTINUED OPERATION:

  This valve is used for sampling in support of coolant chemistry control and is normally closed during plant operation. If the valve should be open when a LOCA occurs, it would complete its safety function within less than one minute by closing automatically from an engineered safeguards actuation signal. During this time, the actuator would not be exposed to the effects of chemical spray, since 35 seconds are required to open the reactor building spray valves and deliver design flow from the spray pumps, and 54 seconds are required at design flow to fill the spray line from the isolation valves to the nozzles. The actuator would not be submerged until after it had performed its safety function, and would not be significantly degraded by the brief initial exposure to the accident environment.

  Once closed, the motor leads are de-energized and the "open" portion of the control circuit is not affected by any postulated failure of the actuator limit switches. Therefore, no failure mode can be postulated at the actuator that would spuriously open the valve.

  In addition, a redundant isolation valve, CV-1845, located outside the reactor building provides a redundant isolation function. CV-1054 is qualified for 250°F, 25 psia and 2×10^7 rads, however, since it was not explicitly designed for use inside containment, AP&L is replacing the existing actuator for CV-1054 with an actuator demonstrated to be fully qualified for use inside containment.

  Based on the above analysis, it is concluded that justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-1206

SER RESPONSE PAGE NO(S).: B066

FRC EQUIPMENT ITEM: 22

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-231 Makeup & Purification

LOCATION: Room 53

- SAFETY FUNCTION:

  Seal Injection Isolation Valve - This valve is required to isolate the seal injection line.

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, and aging not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-1216, -1214

SER RESPONSE PAGE NO(S).: A047, A046

FRC EQUIPMENT ITEM: 4

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-231 Makeup & Purification

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Reactor Coolant Letdown Line Isolation

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of these devices is deficient in the following areas: Similarity between tested and installed device not established and aging not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report 600456).

  Since similarity has been established, all aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1219

SER RESPONSE PAGE NO(S).: B069

FRC EQUIPMENT ITEM: 25

MANUFACTURER AND MODEL NO.: Limitorque SMB-00

SYSTEM - P&ID NO.: Makeup & Purification System M-231

LOCATION: Room 79

- SAFETY FUNCTION:

  High Pressure Injection Valves - This valve is required to open to deliver high pressure injection to the reactor, if needed. (Loop A)

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device. (Limitorque test report B0003.)

  The qualified radiation level for this component is $2x10^7$ rads per test B0003. The maximum required dose due to recirculation of LOCA fluids for equipment located in Room 79 is $3.6x10^7$ rads; however, location specific calculations were performed which reduced this dose to $7.6x10^6$ rads. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of $6.5x10^6$ rads to this component must be considered. This corresponds to a total dose of $1.4x10^7$ rads which is less than the qualified level of $2x10^7$ rads. Therefore, radiation is not considered an outstanding item.

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1220

SER RESPONSE PAGE NO(S).: B070

FRC EQUIPMENT ITEM: 25

MANUFACTURER AND MODEL NO.: Limitorque SMB-00

SYSTEM - P&ID NO.: Makeup & Purification M-231

LOCATION: Room 79

- SAFETY FUNCTION:

  High Pressure Injection Valve - This valve is required to open to deliver High Pressure injection to the reactor vessel if needed. (Loop A)

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device. (Limitorque test report B0003.)

  The qualified radiation level for this component is $2x10^7$ rads per test B0003. The maximum required dose due to recirculation of LOCA fluids for the equipment located in Room 79 is $3.6x10^7$ rads; however, location specific calculations were performed which reduced this dose to $1.1x10^7$ rads. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of $3.8x10^6$ rads to this component must be considered. This corresponds to a total dose of $1.5x10^7$ rads which is less than the qualified level of $2x10^7$ rads. Therefore, radiation is no longer an outstanding item.

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-1227, -1228

SER RESPONSE PAGE NO(S).: B072, B073

FRC EQUIPMENT ITEM: 22

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-231 Makeup & Purification

LOCATION: Room 53

- SAFETY FUNCTION:

  High Pressure Injection Valves - These valves are required to open to deliver high pressure injection to the reactor if needed (Loop B).

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, and aging not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1234

SER RESPONSE PAGE NO(S).: B076

FRC EQUIPMENT ITEM: 25

MANUFACTURER AND MODEL NO.: Limitorque SMB-00

SYSTEM - P&ID NO.: Makeup and Purification M-231

LOCATION: Room 79

- SAFETY FUNCTION:

  Makeup Block Valve - This valve is required to isolate makeup line A.

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  The qualified radiation level for this component is $2x10^7$ rads per test B0003. The maximum required dose for equipment located in Room 79 is $3.6x10^7$ rads; however, location specific calculations were performed which reduced the dose for this device to $8x10^4$ rads. Therefore, radiation is no longer an outstanding item.

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1270, -1271, -1272, -1273

SER RESPONSE PAGE NO(S).: A048, A049, A050, A051

FRC EQUIPMENT ITEM: 1

MANUFACTURER AND MODEL NO.: Limitorque SMB-00 and SMB-000

SYSTEM - P&ID NO.: M-231, Makeup & Purification

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Reactor Coolant Pump Seal Bleedoff Isolation

- QUALIFICATION DISCREPANCY:

  According to the Franklin "Technical Evaluation Report" (TER), qualification of these devices is deficient in the following areas: Similarity to test specimen not established and aging (qualified life) not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  These devices have been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device; however, we have obtained information by walkdown (motor manufacturer and insulation class) needed to assure qualification. We are awaiting formal documentation from Limitorque which will confirm the qualification of the motor and officially close this item. The applicable test report is 600198.

  Once similarity is established, the devices satisfy all aging requirement per Limitorque report B0058.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-1274

SER RESPONSE PAGE NO(S).: B077

FRC EQUIPMENT ITEM: 7

MANUFACTURER AND MODEL NO.: Limitorque SMB-00

SYSTEM - P&ID NO.: M-231 Makeup and Purification

LOCATION: Room 79

- SAFETY FUNCTION:

  Reactor Coolant Pump Seal Bleedoff Return Line Isolation

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between installed and tested device not established, aging not adequately demonstrated, and criteria regarding radiation not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between tested device and installed device without documentation from Limitorque. AP&L has the documentation necessary to establish the similarity and has confirmed similarity between the installed and tested device. The applicable test report is B0003.

  The applicable radiation exposure of the tested device is 2 E7 rads which is lower than the "required" dose of 3.6 E7 listed on the SCEW sheet; however, this represents a 30 day dose whereas this device's operating time is one minute. Taking this into account, the required dose can be reduced to 8×10^4 rads.

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1404

SER RESPONSE PAGE NO(S).: B086

FRC EQUIPMENT ITEM: 25

MANUFACTURER AND MODEL NO.: Limitorque SMB-0

SYSTEM - P&ID NO.: Decay Heat Removal M-232

LOCATION: Room 79

- SAFETY FUNCTION:

  Decay Heat Removal Line Isolation

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report, similarity was not properly established, aging was not adequately evaluated, and radiation criteria was not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  A systems review has confirmed that this device is required for two main functions: (1) To open for Decay Heat Removal operations, and (2) for containment isolation of the Decay Heat Removal line. Since cold shutdown is not required to be considered, the containment isolation function remains. However, this valve is normally closed and can only be opened by manual (operator) action which occurs only for Decay Heat Removal. Therefore, the isolation function is assured.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-1405

SER RESPONSE PAGE NO(S).: B087

FRC EQUIPMENT ITEM: 17

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-232 Decay Heat Removal

LOCATION: Room 13

- SAFETY FUNCTION:

  Containment Sump Line Isolation Valve - This valve is required to open to initiate reactor building sump recirculation or to close to terminate recirculation (Train A).

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, and aging not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-1406

SER RESPONSE PAGE NO(S).: B088

FRC EQUIPMENT ITEM: 18

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-232 Decay Heat Removal

LOCATION: Room 10/11

- SAFETY FUNCTION:

  Containment Sump Line Isolation Valve - This valve is required to open to initiate recirculation of sump water.

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  The qualified radiation level for this component is $2x10^7$ rads per test B0003. The maximum required dose for equipment located in Room 10/11 is $3x10^7$ rads; however, location specific calculations were performed which reduced the dose to $2.8x10^6$ rads. Therefore, radiation is no longer an outstanding item.

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1814

SER RESPONSE PAGE NO(S).: A065

FRC EQUIPMENT ITEM: 27

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-000

SYSTEM - P&ID NO.: M-237 Sampling System

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Pressurizer (steam space) Sampling Line Isolation

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report (TER), qualification of this device is deficient in the following areas: similarity to test specimen not established and aging (qualified life) not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This device has been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device; however, we have obtained information by walkdown (motor manufacturer and insulation class) needed to assure qualification. We are awaiting formal documentation from Limitorque which will confirm the qualification of the motor and officially close this item.

  Once similarity is established, the device satisfies all aging requirements per Limitorque report B0058.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1816

SER RESPONSE PAGE NO(S).: A066

FRC EQUIPMENT ITEM: 27

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-000

SYSTEM - P&ID NO.: M-237, Sampling System

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Pressurizer (water space) Sampling Line Isolation

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report (TER), qualification of this device is deficient in the following areas: similarity to test specimen not established and aging (qualified life) not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This device has been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device; however, we have obtained information by walkdown (motor manufacturer and insulation class) needed to assure qualification. We are awaiting formal documentation from Limitorque which will confirm the qualification of the motor and officially close this item.

  Once similarity is established, the device satisfies all aging requirements per Limitorque report B0058.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1820

SER RESPONSE PAGE NO(S).: A067

FRC EQUIPMENT ITEM: 27

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-000

SYSTEM - P&ID NO.: M-237, Sampling System

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Steam Generator "A" Sampling Line Isolation

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report (TER), qualification of this device is deficient in the following areas: similarity to test specimen not established and aging (qualified life) not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This device has been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device; however, we have obtained information by walkdown (motor manufacturer and insulation class) needed to assure qualification. We are awaiting formal documentation from Limitorque which will confirm the qualification of the motor and officially close this item.

  Once similarity is established, the device satisfies all aging requirements per Limitorque report B0058.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-1826

SER RESPONSE PAGE NO(S).: A068

FRC EQUIPMENT ITEM: 27

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-000

SYSTEM - P&ID NO.: M-237, Sampling System

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Steam Generator "B" Sampling Line Isolation

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report (TER), qualification of this device is deficient in the following areas: similarity to test specimen not established and aging (qualified life) not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This device has been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device; however, we have obtained information by walkdown (motor manufacturer and insulation class) needed to assure qualification. We are awaiting formal documentation from Limitorque which will confirm the qualification of the motor and officially close this item.

  Once similarity is established, the device satisfies all aging requirements per Limitorque report B0058.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-2215

SER RESPONSE PAGE NO(S).: A056

FRC EQUIPMENT ITEM: 1

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-234, Intermediate Cooling System

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Letdown Coolers Isolation

- QUALIFICATION DISCREPANCY:

  According to the Franklin "Technical Evaluation Report" (TER), qualification of these devices is deficient in the following areas: Similarity to test specimen not established and aging (qualified life) not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This device has been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device; however, we have obtained information by walkdown (motor manufacturer and insulation class) needed to assure qualification. We are awaiting formal documentation from Limitorque which will confirm the qualification of the motor and officially close this item. The applicable test report is 600198.

  Once similarity is established, the devices satisfy all aging requirement per Limitorque report B0058.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-2221

SER RESPONSE PAGE NO(S).: A057

FRC EQUIPMENT ITEM: 1

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-234, Intermediate Cooling System

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Control Rod Drive/Reactor Coolant Pump Coolant Isolation

- QUALIFICATION DISCREPANCY:

  According to the Franklin "Technical Evaluation Report" (TER), qualification of these devices is deficient in the following areas: Similarity to test specimen not established and aging (qualified life) not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This device has been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device; however, we have obtained information by walkdown (motor manufacturer and insulation class) needed to assure qualification. We are awaiting formal documentation from Limitorque which will confirm the qualification of the motor and officially close this item. The applicable test report is 600198.

  Once similarity is established, the devices satisfy all aging requirement per Limitorque report B0058.

  Based on the above, justification for continued operation is demonstrated.

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-2400

SER RESPONSE PAGE NO(S).: B111

FRC EQUIPMENT ITEM: 25

MANUFACTURER AND MODEL NO.: Limitorque SMB-0

SYSTEM - P&ID NO.: R.B. Spray and Core Flood M-236

LOCATION: Room 79

- SAFETY FUNCTION:

  Reactor Building Spray Line Isolation - This valve must open to admit containment spray if needed (Train A).

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  The qualified radiation level for this component is $2x10^7$ rads per test B0003. The maximum required dose from recirculation of LOCA fluids for equipment located in Room 79 is $3.6x10^7$ rads; however, location specific calculations were performed which reduced this dose to $1.2x10^7$ rads. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of $1.6x10^6$ rads to this component must be considered. This corresponds to a total dose of approximately $1.4x10^7$ rads which is less than the qualified level of $2x10^7$ rads. Therefore, radiation is no longer an outstanding item.

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-2401

SER RESPONSE PAGE NO(S).: B113

FRC EQUIPMENT ITEM: 25

MANUFACTURER AND MODEL NO.: Limitorque SMB-0

SYSTEM - P&ID NO.: R.B. Spray and Core Flood M-236

LOCATION: Room 79

- SAFETY FUNCTION:

  Reactor Building Spray Line Isolation - This valve must open to admit containment spray if needed (Train B).

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  The qualified radiation level for this component is $2x10^7$ rads per test B0003. The maximum required dose from recirculation of LOCA fluids for equipment located in Room 79 is $3.6x10^7$ rads; however, location specific calculations were performed which reduced this dose to $7.0x10^6$ rads. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of $1.6x10^6$ rads to this component must be considered. This corresponds to a total dose of $8.6x10^6$ rads which is less than the qualified level of $2x10^7$ rads. Therefore, radiation is no longer an outstanding item.

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-2617

SER RESPONSE PAGE NO(S).: B009

FRC EQUIPMENT ITEM: 13

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-000

SYSTEM - P&ID NO.: M-206 Steam Generator Secondary

LOCATION: Room 170

- SAFETY FUNCTION:

  Normally closed valve CV-2617 is required to open in order to supply main steam to the Emergency Feedwater Pump Turbine on receipt of a Steam Line Break Isolation Channel (SLBIC) "B" signal. CV-2617 must be manually reclosed if the break is upstream of the "B" Once Through Steam Generator (OTSG) main steam isolation valve.

- QUALIFICATION DISCREPANCY:

  The specified peak temperature is 390°F, and the valve is qualified to 250°F. Franklin indicates that similarity and aging are also not adequately addressed.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The high temperature environment leading to failure of CV-2617 is the result of a postulated main steam line break immediately downstream from a Reactor Building penetration. CV-2617 is further downstream in the same line. The normal safety function for CV-2617 is to open, which would not be required following the break upstream of CV-2617. CV-2617 is also required to be manually closed following an upstream break in order to isolate the break. CV-2617 is qualified for duty at 250°F, and its environment will peak at 390°F. If the operator is able to identify the break location and close the valve within a few seconds after the break, thermal lag of the valve and actuator housings should allow the valve to complete its function, based on engineering judgement. Additionally, the turbine driven EFW pump is backed up by a motor driven pump, and the reactor decay heat can be successfully removed using primary bleed and feed.

  AP&L is in the process of modifying the valve to demonstrate full capability to withstand the peak temperature by adding thermal shielding.

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report.

This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified upon completion of the thermal shielding modification.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-2670

SER RESPONSE PAGE NO(S).: B006

FRC EQUIPMENT ITEM: 12

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-204 Condensate & Feedwater

LOCATION: Room 53

- SAFETY FUNCTION:

  Emergency Feedwater (EFW) Feed Valve - This valve is required to open to deliver EFW to the "A" Steam Generator.

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established and aging not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-3813

SER RESPONSE PAGE NO(S).: B006

FRC EQUIPMENT ITEM: 25

MANUFACTURER AND MODEL NO.: Limitorque SMB-00

SYSTEM - P&ID NO.: Service Water M-210

LOCATION: Room 79

- SAFETY FUNCTION:

  Service Water Line (to Reactor Building Cooling Coils) Isolation

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satisifed.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device. (Limitorque test report B0003.)

  The qualified radiation level for this component is $2x10^7$ rads per test B0003. The maximum required dose due to recirculation of LOCA fluids for equipment located in Room 79 is $3.6x10^7$ rads; however, location specific calculations were performed which reduced this dose to $2.0x10^6$ rads. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of $1.6x10^6$ rads to this component must be considered. This corresponds to a total dose of $3.6x10^6$ rads which is less than the qualified level of $2x10^7$ rads. Therefore, radiation is no longer an outstanding item.

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-4803

SER RESPONSE PAGE NO(S).: A010

FRC EQUIPMENT ITEM: 3

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-000

SYSTEM - P&ID NO.: M-215 Gaseous Radioactive Waste

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Reactor Building Vent Header Isolation

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established and aging not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report 600456).

  Since similarity has been established, all aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-5611

SER RESPONSE PAGE NO(S).: B052

FRC EQUIPMENT ITEM: 149

MANUFACTURER AND MODEL NO.: Electrodyne TN-2000-3

SYSTEM - P&ID NO.: Fire Water M-219

LOCATION: Room 77

- SAFETY FUNCTION:

  To isolate the Fire Water supply line to the reactor building.

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report, similarity between the installed and tested device has not been demonstrated, and aging has not been adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The environment specified on the worksheet (except for radiation) represents High Energy Line Break conditions; however, this device is required for containment isolation only in the case of a LOCA. The environmental parameters are not harsh in Room 77 following a LOCA. The radiation dosage due to recirculation of LOCA fluids is only 490 rads which is non-harsh. Therefore, this device will be removed from the master list since it is located in a "mild" environment.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-6205

SER RESPONSE PAGE NO(S).: A012

FRC EQUIPMENT ITEM: 2

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-000

SYSTEM - P&ID NO.: M-222 Chilled Water System

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Reactor Building Chilled Water Isolation

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established and aging not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report 600456).

  Since similarity has been established, all aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-7446, -7444

SER RESPONSE PAGE NO(S).: A094, A093

FRC EQUIPMENT ITEM: 26

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-000

SYSTEM - P&ID NO.: M-261 HVAC Reactor Building

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Reactor Building Air Return Line Isolation

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of these devices is deficient in the following areas: similarity between tested and installed device, and aging not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device. (Limitorque test report 600456).

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the devices fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-7445

SER RESPONSE PAGE NO(S).: B135

FRC EQUIPMENT ITEM: 25

MANUFACTURER AND MODEL NO.: Limitorque SMB-000

SYSTEM - P&ID NO.: HVAC Reactor Bldg. M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  Reactor Building Air Inlet Line Isolation (from Hydrogen Purge System). This valve must open for hydrogen purge system operation (Train B).

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  The qualified radiation level for this component is $2x10^7$ rads per test B0003. The maximum required dose from recirculation of LOCA fluids for equipment located in Room 79 is $3.6x10^7$ rads; however, location specific calculations were performed which reduced this dose to $2.3x10^6$ rads. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of $1.8x10^7$ rads to this component must be considered. However, this device is required to open at the beginning of hydrogen purge before filter contamination. If isolation of the line were required after purging, check valves HPA-2, HPA-5 and HPA-9 would provide this function. In any case, the total radiation dose would be approximately $2x10^7$ rads which corresponds to the qualified radiation level; therefore, radiation is not considered an outstanding item.

Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-7450, -7448

SER RESPONSE PAGE NO(S).: A096, A095

FRC EQUIPMENT ITEM: 26

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-000

SYSTEM - P&ID NO.: M-261 HVAC Reactor Building

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Reactor Building Air Outlet Line Isolation

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of these devices is deficient in the following areas: similarity between tested and installed device, and Aging not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report 600456).

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider these devices fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-7449

SER RESPONSE PAGE NO(S).: B137

FRC EQUIPMENT ITEM: 25

MANUFACTURER AND MODEL NO.: Limitorque SMB-000

SYSTEM - P&ID NO.: HVAC Reactor Bldg. M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  Reactor Building Air Outlet Line Isolation. This valve is required to open for hydrogen purge system operation.

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  The qualified radiation level for this component is $2x10^7$ rads per test B0003. The maximum required dose from recirculation of LOCA fluids for equipment located in Room 79 is $3.6x10^7$ rads; however, location specific calculations were performed which reduced this dose to $2.3x10^6$ rads. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of $1.8x10^7$ rads to this component must be considered. This corresponds to a total dose of approximately $2x10^7$ rads which is the level to which the valve has been qualified; therefore, radiation is no longer an outstanding item.

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-7452

SER RESPONSE PAGE NO(S).: B140

FRC EQUIPMENT ITEM: 25

MANUFACTURER AND MODEL NO.: Limitorque SMB-000

SYSTEM - P&ID NO.: HVAC - Reactor Bldg. - M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  Reactor Building Hydrogen Purge Line Isolation

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  The dose to this item due to recirculation of LOCA fluids is 2.4 E6 rads; however, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of 7.2 E7 rads to this component must be considered for a total dose of approximately 7.5 E7 rads.

  This device is only required to close if the hydrogen purge exhaust indicates high radiation levels. In this case, the compressor would be turned off and containment isolation valves CV-7449 and CV-7450 would assure minimal air flow through this line.

AP&L is now pursuing possible reduction of the dose through additional analysis. If the dose cannot be sufficiently lowered, AP&L will replace the actuator with a fully qualified substitute by the next refueling outage.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-7453

SER RESPONSE PAGE NO(S).: A097

FRC EQUIPMENT ITEM: 2

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-000

SYSTEM - P&ID NO.: M-261 HVAC Reactor Bldg.

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Air Particulate Monitor Line Isolation

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established and aging not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report 600456).

  Since similarity has been established, all aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve - Actuator

TAG NO(S).: CV-7454

SER RESPONSE PAGE NO(S).: B142

FRC EQUIPMENT ITEM: 7

MANUFACTURER AND MODEL NO.: Limitorque SMB-000

SYSTEM - P&ID NO.: M-261 HVAC Reactor Building

LOCATION: Room 79

- SAFETY FUNCTION:

  Air Particulate Monitor Line Isolation

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between installed and tested device not established, aging not adequately demonstrated, and criteria regarding radiation not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between tested device and installed device without documentation from Limitorque. AP&L has the documentation necessary to establish the similarity and has confirmed similarity between the installed and tested device. The applicable test report is B0003.

  The applicable radiation exposure of the tested device is 2 E7 rads which is lower than the "required" dose of 3.6 E7 listed on the SCEW sheet; however, this represents a 30 day dose whereas this device's operating time is one minute. Taking this into account, the required dose can be reduced to 8×10^4 rads.

  Since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

  Based on the above, justification for continued operation is demonstrated.

COMPONENT: Electrical Penetrations

TAG NO(S).: GEN-1003, -1004, -1005, -1006

SER RESPONSE PAGE NO(S).: A100, A101, A102, A103

FRC EQUIPMENT ITEM: 142, 143, 144, 145

MANUFACTURER AND MODEL NO.: Conax model WR1 through WR9

SYSTEM - P&ID NO.: Various

LOCATION: Reactor Building

- SAFETY FUNCTION:

  To provide electrical penetration connection for safety related cabling through the Reactor Building boundary.

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity between the tested components, and models installed has not been demonstrated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  AP&L has compared the model numbers for Conax penetrations tested for AP&L to those listed on the worksheets and agree that the discrepancies create problems in establishing similarity.

  After investigating the problem, it was determined that errorneous model numbers were originally entered on the worksheets. AP&L has determined the proper model numbers and confirmed they are the same as those listed in the test report. Therefore, similarity has now been established and the penetrations are considered fully qualified.

  Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hardline Coaxial Cable

TAG NO(S).: GEN-1007

SER RESPONSE PAGE NO(S).: C015

FRC EQUIPMENT ITEM: 148

MANUFACTURER AND MODEL NO.: Endevco 3075M6

SYSTEM - P&ID NO.: Various

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Cables interconnecting acoustic monitoring system for pressurizer relief valve position indication. The system is used to determine safety or power operated relief valve position, for the purpose of determining possible loss of coolant or steam relief pathways.

- QUALIFICATION DISCREPANCY:

  None, pending results of test.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This component is a part of the acoustic monitoring system for pressurizer relief valve position, installed as a post-TMI retrofit in response to NUREG 0737. It performs no protective action. When purchased, it was believed to be among the best available for nuclear service.

  If this monitor failed to function during a LOCA caused by pressurizer steam-side relief, additional methods might be utilized for determining the source of the event:

  1. Pressurizer level increase withiout primary pressure and temperature increase.

  2. Safety and power relief valve tailpipe temperature increase.

  3. Quench tank level, pressure, and temperature increase.

  Should none of these indications be available, the emergency core cooling system will nevertheless protect the core without requiring identification of the leak pathway or valve position.

  This cable is presently under test to demonstrate environmental qualification.

  Based on the above, justification for continued operation has been demonstrated.

COMPONENT: Part of Acoustic Monitor (Coax Cable)

TAG NO(S).: Not stated by Franklin

SER RESPONSE PAGE NO(S).: Not stated by Franklin

FRC EQUIPMENT ITEM: 141

MANUFACTURER AND MODEL NO.: Endevco

SYSTEM - P&ID NO.: Various

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Cabling for the acoustic monitors whose function is to determine safety or power operated relief valve position for the purpose of determining possible loss of coolant or steam relief pathway.

- QUALIFICATION DISCREPANCY:

  Franklin indicates inadequate documentation to establish qualification was submitted.

- JUSTIFICATION FOR CONTINUED OPERATION:

  Since Franklin did not reference a tag number or applicable worksheet number, the item referred to by this Franklin equipment item is unclear.

  The electrical cable for the acoustic monitors is documented by AP&L item GEN-1007 (Franklin equipment item 148).

  It is apparent that Franklin item 141 is an accidental duplication of item 148. Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Cable Connectors for Pressurizer Relief Valve Monitoring

TAG NO(S).: GEN-1008

SER RESPONSE PAGE NO(S).: C016

FRC EQUIPMENT ITEM: 138

MANUFACTURER AND MODEL NO.: Endevco EJ34

SYSTEM - P&ID NO.: Various

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Connectors used for pressurizer relief valve acoustic position monitoring system. The system is used to determine safety or power operated relief valve position, for the purpose of determining possible loss of coolant or steam relief pathways.

- QUALIFICATION DISCREPANCY:

  All

- JUSTIFICATION FOR CONTINUED OPERATION:

  This component is a part of the acoustic monitoring system for pressurizer relief valve position, installed as a post-TMI retrofit in response to NUREG 0737. It performs no protective action. When purchased, it was believed to be among the best available for nuclear service.

  If this monitor failed to function during a LOCA caused by pressurizer steam-side relief, additional methods might be utilized for determining the source of the event:

  1. Pressurizer level increase withiout primary pressure and temperature increase.

  2. Safety and power relief valve tailpipe temperature increase.

  3. Quench tank level, pressure, and temperature increase.

  Should none of these indications be available, the emergency core cooling system will nevertheless protect the core without requiring identification of the leak pathway or valve position.

  The cable is presently under test to demonstrate environmental qualification.

  Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Part of Acoustic Monitor (electrical connector)

TAG NO(S).: Not stated by Franklin

SER RESPONSE PAGE NO(S).: Not stated by Franklin

FRC EQUIPMENT ITEM: 139

MANUFACTURER AND MODEL NO.: Endevco

SYSTEM - P&ID NO.: Various

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Cable connection for acoustic monitors whose function is to determine safety or power operated relief valve position for the purpose of determining possible loss of coolant or steam relief pathway.

- QUALIFICATION DISCREPANCY:

  Franklin indicates inadequate documentation to establish qualification was submitted.

- JUSTIFICATION FOR CONTINUED OPERATION:

  Since Franklin did not reference a tag number or applicable worksheet number, the item referred to by this Franklin equipment item is unclear.

  The electrical connector for the acoustic monitors is documented by AP&L item GEN-1008 (Franklin equipment item 138). It is apparent that Franklin item 139 is an accidental duplication of item 138.

  Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Box and Pressure Seal Assembly

TAG NO(S).: GEN-1009

SER RESPONSE PAGE NO(S).: A104

FRC EQUIPMENT ITEM: 155

MANUFACTURER AND MODEL NO.: Foxboro (Conax 3-XJB-I-25)

SYSTEM - P&ID NO.: Various

LOCATION: Reactor Building

- SAFETY FUNCTION:

  To provide proper seal connection for Foxboro transmitters.

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity has not been established.

- JUSTIFICATION FOR CONTINUED OPERATION:

  These devices are Conax connectors supplied by Foxboro for selected transmitters. Proper functioning of the connectors is necessary to ensure proper functioning of the transmitters.

  Franklin apparently grouped this item with items 142-145 since they referenced their writeup of item 144; however, we have referenced a separate test report which identifies the same connector model number. Therefore, similarity has been established.

  Note that only three Foxboro transmitters are on the qualification list and JCO's for these devices are also provided.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Level Sensor

TAG NO(S).: LE-5645, LE-5646

SER RESPONSE PAGE NO(S).: C013, C014

FRC EQUIPMENT ITEM: 58

MANUFACTURER AND MODEL NO.: GEMS Model XM-54852-72

SYSTEM - P&ID NO.: Decay Heat Removal M-232

LOCATION: Reactor Building

- SAFETY FUNCTION:

  To provide additional accident monitoring information to the operator, specifically, a continuous indication of containment water level.

- QUALIFICATION DISCREPANCY:

  No specific concerns were listed by Franklin pending the results of current testing programs to qualify the device.

- JUSTIFICATION FOR CONTINUED OPERATION:

  Test documentation has been obtained which qualifies these devices for a 300°F/59 psig/100% relative humidity/boric acid environment for 4 hours. In addition, another test report qualifies these instruments for a 150°F/boric acid environment for 14 days and 2×10^8 rads. Testing currently underway is expected to demonstrate qualification for the specified time period of 30 days.

  These items were added as part of the TMI Action Plan requirements of NUREG 0737 and perform a monitoring function only.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: HPI Loop Flow Measurement Differential Pressure Transmitter

TAG NO(S).: PDT-1209, PDT-1210, PDT-1228, PDT-1230

SER RESPONSE PAGE NO(S).: B067, B068, B074, B075

FRC EQUIPMENT ITEM: 101

MANUFACTURER AND MODEL NO.: Bailey BY-3240X-A

SYSTEM - P&ID NO.: Makeup and Purification M-231

LOCATION: Room 53

- SAFETY FUNCTION:

  Measures HPI flow to each reactor coolant loop, provides flow indication and high/low flow alarms in Control Room. During the injection phase following a LOCA, flow indication and throttling of the respective injection MOVs are used to prevent pump cavitation.

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity, aging, accuracy, and operating time were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The harsh temperature and pressure environment is caused by a letdown line break. HPI could be required to mitigate the subsequent loss of coolant; however, the break would be automatically isolated on low primary system pressure or would be manually isolated. Since the break size is 4" diameter or less, the HPI pumps would not be expected to runout during the period of time when the break is not isolated. Therefore, the flow measurement is not critical to preventing pump cavitation.

  The harsh radiation environment specified is due to post-accident recirculation lines in Room 53; however, the instrument performs its major safety function during the injection phase of the LOCA or steam line break when no recirculation source exists and the dose is limited to 3.5 E4 rads (40 year normal plus post-accident airborne). This is a non-harsh radiation environment. During the recirculation phase, the monitoring function is not considered critical.

  The Bailey "BY" transmitter has been demonstrated qualified to 60 psig, 275°, and $2x10^4$ rads.

  Based on the above, justification for continued operation has been demonstrated.

COMPONENT: Decay Heat Cooler Flow Measurement Differential Pressure Transmitter

TAG NO(S).: PDT-1401

SER RESPONSE PAGE NO(S).: B084

FRC EQUIPMENT ITEM: 100

MANUFACTURER AND MODEL NO.: Bailey BY-3240X-A

SYSTEM - P&ID NO.: Decay Heat Removal M-232

LOCATION: Room 14

- SAFETY FUNCTION:

  Measure Decay Heat Removal Pump P34A discharge flow during LPI and decay heat removal operation, and provide low flow alarm and indication to the Control Room. Flow is monitored as during the injection phase following a LOCA, and the respective LPI injection MOVs are throttled to prevent pump cavitation.

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity, aging, accuracy, and operating time were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  Except for radiation, the specified harsh environment is due to a letdown line break outside the reactor building. Although this component is required to mitigate the effects of a letdown line break outside the reactor building (for subsequent decay heat removal), the pressure and temperature conditions caused by the line break are not severe (111°F maximum temperature, 15.7 psia maximum pressure) and will return to normal ambient conditions before decay heat removal system operation is required. Low pressure injection would not be required for mitigating a letdown line break outside the reactor building.

  The harsh radiation environment specified is due to post-accident recirculation lines in Room 14; however, the instrument performs its major safety function during the injection phase of the LOCA when no recirculating source exists and the dose is limited to 5.4 E3 rad (40 year dose plus post-accident airborne). This is a non-harsh radiation environment. During the recirculation phase, the monitoring function is not considered critical.

  Based on the above, justification for continued operation has been demonstrated.

COMPONENT: Decay Heat Cooler Flow Measurement PDT

TAG NO(S).: PDT-1402

SER RESPONSE PAGE NO(S).: B085

FRC EQUIPMENT ITEM: 101

MANUFACTURER AND MODEL NO.: Bailey BY-3240X-A

SYSTEM - P&ID NO.: Decay Heat Removal M-232

LOCATION: Room 10

- SAFETY FUNCTION:

  Measure Decay Heat Removal Pump P34B discharge flow during LPI and decay heat removal operation and provide low flow alarm and indication to the Control Room. Flow is monitored during the injection phase following a LOCA, and the respective LPI injection MOVs are throttled to prevent pump cavitation.

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity, aging, accuracy, and operating time were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  Except for radiation, the specified harsh environment is due to a letdown line break outside the reactor building. Although this component is required to mitigate the effects of a letdown line break outside the reactor building (for subsequent decay heat removal), the pressure and temperature conditions caused by the line break are not severe (111°F maximum temperature, 15.7 psia maximum pressure) and will return to normal ambient conditions before decay heat removal system operation is required. Low pressure injection would not be required for mitigating a letdown line break outside the reactor building.

  The harsh radiation environment specified is due to post-accident recirculation lines in Room 10; however, the instrument performs its major safety functions during the injection phase of the LOCA, when no recirculating source exists and the dose is limited to 5.4 E3 rad (40 year dose plus post-accident airborne). This is a non-harsh radiation environment. During the recirculation phase, the monitoring function is not considered critical.

  Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Flow Transmitters

TAG NO(S).: PDT-2120

SER RESPONSE PAGE NO(S).: B167

FRC EQUIPMENT ITEM: 96

MANUFACTURER AND MODEL NO.: Fischer & Porter 10B2494AB

SYSTEM - P&ID NO.: Penetration Room HVAC, M-264

LOCATION: Room 47

- SAFETY FUNCTION:

  To measure penetration room exhaust fan air flow rates (used as input for system controls).

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report, similarity, aging, accuracy, and operating time were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The specified harsh environmental conditions (except for radiation) result from a high energy line break; however, this device would not be required in this case. The LOCA does not create harsh conditions in Room 47.

  However, the device could receive a radiation exposure due to the presence of the penetration room HVAC filters in Room 47. Based on worst-case penetration seal leakage, the transmitter could receive a dose of 7.5 E5 rad. AP&L has test documentation indicating that similar Fischer Porter transmitters have been qualified to levels in excess of 1 E7 rads; however, AP&L has not been able to confirm (or deny) that the installed transmitters are identical in all respects to the tested device.

  The worst effect of failure of these components would be:

  1. Loss of low flow interlock to redundant HVAC train; loss of automatic start of redundant equipment train. The redundant equipment train could be manually started, if necessary.

  2. Loss of correct flow indication; system performance can be inferred from measuring fan load amperes with portable instrumentation, knowing the design parameters of the system.

  AP&L recognizes that qualification must eventually be fully demonstrated for this component; therefore, a fully qualified replacement (if available) will be installed during the next refueling outage.

  Based on the above analysis, it is concluded that justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Flow Transmitters

TAG NO(S).: PDT-2121, -2131

SER RESPONSE PAGE NO(S).: B168, B174

FRC EQUIPMENT ITEM: 97

MANUFACTURER AND MODEL NO.: Fischer & Porter 10B2494BB

SYSTEM - P&ID NO.: Penetration Room HVAC, M-264

LOCATION: Room 47

- SAFETY FUNCTION:

  To measure air flow across a carbon filter when it has been taken out of service. Air flow must be maintained across an iodine exposed filter to prevent it reaching its combustion temperature and igniting.

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evalutaion Report, similarity, aging, accuracy, and operating time were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This device is required for a LOCA only. The specified harsh environmental conditions (except for radiation) result from a high energy line break; therefore, these devices would not be required in this case. The LOCA does not create harsh conditions in Room 47; however, the devices could be exposed to a radiation dose due to the presence of the penetration room HVAC filters in Room 47. Based on worst case penetration seal leakage, PDT-2121 will receive a radiation dose of 9.7 E5 rad (40 year plus 30 days post accident) and PDT-2131 will receive a radiation dose of 1.9 E6 rad (40 year plus 30 days post accident). AP&L has test documentation indicating that similar Fischer Porter transmitters have been qualified to levels in excess of 1 E7 rads; however, AP&L has not been able to confirm (or deny) that the installed transmitters are identical in all respects to the tested device.

  The worst effect of failure of these components would be loss of flow indication; system performance can be inferred by verifying that the filter bypass valves CV-2126 and CV-2136 are open.

  AP&L recognizes that qualification must eventually be fully demonstrated for this component; therefore, a fully qualified replacement (if available) will be installed during the next refueling outage.

  Based on the above analysis, it is concluded that justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Flow Transmitter

TAG NO(S).: PDT-2130

SER RESPONSE PAGE NO(S).: B173

FRC EQUIPMENT ITEM: 97

MANUFACTURER AND MODEL NO.: Fischer & Porter 10B2494BB

SYSTEM - P&ID NO.: Penetration Room HVAC, M-264

LOCATION: Room 47

- SAFETY FUNCTION:

  To measure exhaust fan air flow rate (used as input for system controls)

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report, similarity, aging, accuracy, and operating time were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This device is required for a LOCA only. The specified harsh environmental conditions (except for radiation) result from a high energy line break; therefore, this device would not be required in this case. The LOCA does not create harsh conditions in Room 47; however, the device could receive a radiation exposure due to the presence of the penetration room HVAC filters in Room 47. Based on worst case penetration seal leakage, this device could receive a dose of 7.5 E5 rads. AP&L has test documentation indicating that similar Fischer Porter transmitters have been qualified to levels in excess of 1 E7 rads; however, AP&L has not been able to confirm (or deny) that the installed transmitters are identical in all respects to the tested device.

  The worst effect of failure of these components would be:

  1. Loss of low flow interlock to redundant HVAC train; loss of automatic start of redundant equipment train. The redundant equipment train could be manually started, if necessary.

  2. Loss of correct flow indication; system performance can be inferred from measuring fan load amperes with portable instrumentation, knowing the design parameters of the system.

  AP&L recognizes that qualification must eventually be fully demonstrated for this component; therefore, a fully qualified replacement (if available) will be installed during the next refueling outage.

  Based on the above analysis, it is concluded that justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Spray Pump P35B Flow Measurement Differential Pressure Transmitter

TAG NO(S).: PDT-2400

SER RESPONSE PAGE NO(S).: B112

FRC EQUIPMENT ITEM: 98

MANUFACTURER AND MODEL NO.: Bailey BY-8240X-A

SYSTEM - P&ID NO.: Reactor Building Spray and Core Flooding M-236

LOCATION: Room 53

- SAFETY FUNCTION:

  Measure RBS Pump P35B discharge flow and provide low flow alarm and indication to Control Room. During the injection phase following a LOCA, flow indication and throttling of the respective spray isolation MOVs is used to prevent pump cavitation.

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity, aging, accuracy, and operating time were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  This component is required for a LOCA only. Except for radiation, the specified harsh environment is due to a high energy line break outside the reactor building. Therefore, the component is not exposed to harsh conditions (except for radiation).

  The harsh radiation environment is due to post-accident recirculation lines in Room 53; however, the instrument performs its major safety function duirng the injection phase of the LOCA, when no recirculating source exists and the dose is limited to 3.5 E4 rad (40 year dose plus post-accident airborne dose), which is non-harsh. During the recirculation phase, the device's monitoring function is not critical.

  Based on the above, justification for continued operation is demonstrated.

COMPONENT: Flow Transmitters

TAG NO(S).: PDT-7441, -7451

SER RESPONSE PAGE NO(S).: B127, B139

FRC EQUIPMENT ITEM: 94

MANUFACTURER AND MODEL NO.: Fischer and Porter 10B2491JC

SYSTEM - P&ID NO.: Reactor Building HVAC, M-261

LOCATION: Room 46

- SAFETY FUNCTION:

  To measure Hydrogen Purge System flow rate during post-LOCA Hydrogen Purge System operation.

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report, similarity, aging, accuracy, and operating time were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The specified harsh environmental conditions (except for radiation) result from a high energy line break; however, these devices would not be required in this case. The LOCA does not create harsh conditions in Room 46. However, these devices could receive a radiation dose due to the close proximity of the hydrogen purge filters which become contaminated during the purge process. The transmitters could receive a dose of 3.3 E6 rads. AP&L has test documentation which indicates that similar Fischer Porter transmitters were tested to levels in excess of 1 E7 rads; however, AP&L has been unable to confirm (or deny) that the installed transmitters are identical in all respects to the tested device.

  The worst effect of failure of these components would be:

  1. Loss of low interlock to the respective purge system heater; heater temperature switches TS-7441A and B could provide backup protection for a high temperature condition should the low flow interlock be unavailable.

  2. Spurious trip (false low flow signal) of the purge system heater with normal flow; this event would be detected by the remote indicating lights and if necessary, the spurious trip could be manually overridden. The nature of the purge and filtering process is such that time would be available to perform this action.

  3. Loss of correct flow indication; system performance can be inferred from measuring fan load amperes with portable instrumentation, knowing the design parameters of the system.

The hydrogen purge system is manually controlled and is not required to operate until approximately eleven days after a LOCA. If the purge unit failed, the backup train in Room 79 could be utilized which would not have been exposed to the high dose from the filters.

AP&L is investigating further dose reductions by additional analysis. In addition, ANO-1 has the capability to hook up to external hydrogen recombiners if necessary.

AP&L recognizes that qualification must be fully demonstrated for this component; therefore, a fully qualified replacement (if available) will be installed during the next refueling outage.

Based on the above analysis, it is concluded that justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge System Flow Transmitters

TAG NO(S).: PDT-7442, PDT-7452

SER RESPONSE PAGE NO(S).: 8130, B141

FRC EQUIPMENT ITEM: 95

MANUFACTURER AND MODEL NO.: Fischer & Porter 10B2491JC

SYSTEM - P&ID NO.: Reactor Building HVAC, M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  Measure Hydrogen Purge System flow rate during post-LOCA hydrogen purge system operation.

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity, aging, accuracy, and operating time were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  These devices are needed for a LOCA only. Except for radiation, the specified harsh environment for these components results from an HELB outside reactor building (reactor coolant letdown line break). The hydrogen purge system removes hydrogen from the reactor building after a LOCA.

  Radiation exposure for this device due to pipe lines carrying post-accident recirculation fluids routed through Room 79 was determined to be 1.6 E6 rads. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment an additional exposure of 3.3×10^6 rads for PDT-7442 and 1.6×10^8 rads for PDT-7452 must be considered. AP&L has test documentation indicating that similar transmitters have been qualified to levels in excess of 1 E7 rads; however, AP&L has been unable to confirm (or deny) that the installed transmitters are identical in all respects to the tested device.

  The worst effect of failure of these components would be:

  1. Loss of low flow interlock to the respective purge system heater; heater temperature switches TS-7442A and B would provide backup protection for a high temperature condition should the low flow interlock be unavailable.

2. Spurious trip (false low flow signal) of the purge system heater with normal flow; this event would be detected by the remote indicating lights, and if necessary, the spurious trip could be manually overridden. The nature of the purge and filtering process is such that time would be available to perform this action.

3. Loss of correct flow indication; system performance can be inferred from measuring fan load amperage with portable instrumentation, knowing the design parameters of the system.

The hydrogen purge system is manually controlled and is not required to operate until approximately eleven days after a LOCA. If the purge system failed, the backup train could be utilized.

AP&L is investigating further dose reductions by additional analysis. In addition, ANO-1 has the capability to hook up to external hydrogen recombiners if necessary.

AP&L recognizes that qualification must eventually be fully demonstrated for this component; therefore, a fully qualified replacement (if available) will be installed during the next refueling outage.

Based on the above analysis, it is concluded that justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: RCS Loop A & B Hot Leg Pressure Transmitters

TAG NO(S).: PT-1020, PT-1022, PT-1040

SER RESPONSE PAGE NO(S).: A023, A025, A037

FRC EQUIPMENT ITEM: 108 and 112

MANUFACTURER AND MODEL NO.: Foxboro E11GH

SYSTEM - P&ID NO.: Reactor Coolant, M-230

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Measure RCS hot leg pressure in Loops A and B and provide input to Engineered Safeguards Actuation System for automatic initiation of Emergency Core Cooling via High Pressure or Low Pressure Injection.

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity, aging, and accuracy were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  Similarity has been established between Model E11GH transmitter installed in ANO-1 and the tested Model E11AH transmitter. Effort is currently being undertaken to verify that radiation hardened amplifiers qualified to 3.7×10^7 rads are currently installed; this verification would completely qualify the component except for aging and accuracy.

  These pressure transmitters are used to initiate an engineered safeguards actuation signal on low reactor coolant system pressure. Once safeguards actuation logic has been initiated, their automatic protective action function is completed within seconds, prior to significant environmental degradation. Although changes in instrument accuracy have been noted in qualification tests, the instrument drift has been in the safe direction; i.e., lower than actual pressure reading. The instrument drift will not occur before these transmitters have completed their protective action. With radiation hardened amplifiers, any further degradation of accuracy would be within acceptable limits for post accident monitoring.

  To date, AP&L has been unable to confirm (or deny) that the installed device contains the hardened amplifiers. AP&L recognizes that the transmitters must be fully qualified; therefore, if the necessary documentation cannot be obtained, AP&L will replace the devices by the next refueling outage.

  Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Radiation Monitors

TAG NO(S).: RE-8060, RE-8061

SER RESPONSE PAGE NO(S).: C017, C018

FRC EQUIPMENT ITEM: 137

MANUFACTURER AND MODEL NO.: General Atomic Model RD-23

SYSTEM - P&ID NO.: HVAC Reactor Building M-261

LOCATION: Reactor Building

- SAFETY FUNCTION:

  To provide additional accident monitoring information for the operators, specifically, to monitor post accident containment radiation levels up to a dose rate of 10^8 rad/hr.

- QUALIFICATION DISCREPANCY:

  No specific qualification discrepancies are noted by Franklin, pending completion of qualification test program.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The test program described in prior submittals has been completed. The test report, General Atomics document #254960, qualified General Atomic model RD-23 high range radiation monitors to levels that envelope the ANO-1 environmental conditions.

  The units installed at ANO-1 are model RD-23, therefore, these devices are considered fully qualified.

  These items were required as a result of the TMI action plan, NUREG 0737 and perform a monitoring function only.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Pressurizer Sample Isolation Valve

TAG NO(S).: SV-1818

SER RESPONSE PAGE NO(S).: B114

FRC EQUIPMENT ITEM: 150

MANUFACTURER AND MODEL NO.: Target Rock 80E-001

SYSTEM - P&ID NO.: Sampling System M-237

LOCATION: Room 79

- SAFETY FUNCTION:

  This valve is required to isolate pressurizer sample line during a LOCA to provide Reactor Building isolation.

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity has not been demonstrated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  Except for radiation, the harsh environment specified for this component is due to a high energy line break outside the reactor building; however, this component is not required to function in this case.

  Radiation exposure is due to post accident recirculation lines in Room 79. However, since the device is required for isolation only (and is normally closed), it would complete its isolation function prior to post accident recirculation. Therefore, the radiation exposure would be considered "non-harsh" and the device can be removed from the master list.

  Based on the above, justification for continued operation has been demonstrated.

COMPONENT: Hydrogen Purge System Fans Seal Water Valves

TAG NO(S).: SV-7500, SV-7502

SER RESPONSE PAGE NO(S).: B146, B148

FRC EQUIPMENT ITEM: 151

MANUFACTURER AND MODEL NO.: Target Rock 74F-005

SYSTEM - P&ID NO.: HVAC - Reactor Building; M-261, Sheet 2

LOCATION: Room 46

- SAFETY FUNCTION:

  Supply Seal Water to Hydrogen Purge System Supply and Exhaust Fans Following a LOCA

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity and aging were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  Except for radiation, the specified harsh environment for these components would result from the rupture of a main feedwater line outside the reactor building. The hydrogen purge system removes hydrogen from the reactor building after a LOCA. This system does not perform a safety function after an HELB outside the reactor building; therefore, the environment is non-harsh except for radiation.

  A harsh radiation environment of 1.6 E8 rads and 1.8 E7 rads for SV-7500 and -7502 is due to close proximity to the hydrogen purge filter. The filter becomes contaminated during purging. This represents the worst case surface dose due to purging (i.e., after purging entire postulated containment airborne activity).

  AP&L has only recently verified that the Target Rock valves were assembled and supplied with parts qualified to a radiation dose of 3.3×10^7 Rads. AP&L is now investigating possible reduction of the calculated dose to demonstrate full qualification.

  The hydrogen purge system is manually controlled and not required to operate until approximately 11 days following a LOCA, and would not be exposed to significant doses until well after they had already opened. The valves would not be challenged as long as purging operations continued. If purging ceased, the valves are required to close to prevent service water from leaking past the compressor to the filters. Even if this occurred, purging could be switched to the backup train.

  Based on the above analysis, it is concluded that justification for continued operation has been demonstrated.

COMPONENT: Hydrogen Purge System Fans Seal Water Valves

TAG NO(S).: SV-7501, SV-7503

SER RESPONSE PAGE NO(S).: B144, B150

FRC EQUIPMENT ITEM: 151

MANUFACTURER AND MODEL NO.: Target Rock 74F-005

SYSTEM - P&ID NO.: HVAC - Reactor Building; M-261, Sheet 2

LOCATION: Room 79

- SAFETY FUNCTION:

  Supply Seal Water to Hydrogen Purge System Supply and Exhaust Fans Following a LOCA

- QUALIFICATION DISCREPANCY:

  Similarity, aging

- JUSTIFICATION FOR CONTINUED OPERATION:

  Except for radiation, the specified harsh environment for these components would result from either the rupture of a main feedwater line or a letdown line outside the reactor building. The hydrogen purge system removes hydrogen from the reactor building after a LOCA. This system does not perform a safety function after a HELB outside the reactor building; therefore, the environment is non-harsh except for radiation.

  A harsh radiation environment of 5.8×10^7 rads for SV-7501 and 8.6×10^6 rads for SV-7503 is due to the combination of post accident recirculating fluids and close proximity to the hydrogen purge filter. The latter becomes contaminated during purging. The dose represents the worst case surface dose due to purging (i.e., after purging the entire postulated containment airborne activity).

  AP&L has only recently verified that the Target Rock valves were assembled and supplied with parts qualified to a radiation dose of 3.3×10^7 Rads. AP&L is now investigating possible reduction of the calculated dose to demonstrate full qualification.

  The hydrogen purge system is manually controlled and not required to operate until approximately 11 days following a LOCA, and would not be exposed to significant doses until well after the valves had opened. The valves need not be closed unless purging ceases. In this case, closing the valves is needed to prevent service water from leaking past the compressor to the filters. Even if this occurred, purging could be switched to the redundant train.

Based on the above analysis, it is concluded that justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Pressurizer Liquid Temperature Elements

TAG NO(S).: TE 1000, TE 1001

SER RESPONSE PAGE NO(S).: A015, A017

FRC EQUIPMENT ITEM: 61

MANUFACTURER AND MODEL NO.: Rosemount 104AFP-2

SYSTEM - P&ID NO.: Reactor Coolant System - M230

LOCATION: Reactor Building

- SAFETY FUNCTION:

  This instrument is an RTD which measures pressurizer liquid temperature for providing compensation for pressurizer level measurement and for aid in establishing a bubble in the pressurizer.

- QUALIFICATION DISCREPANCY:

  Similarity, aging, accuracy, functional testing

- JUSTIFICATION FOR CONTINUED OPERATION:

  Neither of the safety functions are critical to safety; temperature compensation is not used for protective actions and safe shutdown can be accomplished without monitoring pressurizer liquid temperatures and establishing a steam bubble in the pressurizer.

  The component performs no function critical to safety, in particular during a LOCA or steam line break; therefore it should be removed from the Master List of equipment requiring qualification.

  Based on the above analysis, it is concluded that justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Coolant Hot Leg Temperature Element (RTD)

TAG NO(S).: TE 1012, TE 1013, TE 1040, TE 1041

SER RESPONSE PAGE NO(S).: A019, A020, A038, A040

FRC EQUIPMENT ITEM: 63 and 64

MANUFACTURER AND MODEL NO.: Rosemount 177GY

SYSTEM - P&ID NO.: Reactor Coolant System - M230

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Measures reactor coolant hot leg temperatures, providing inputs to the Reactor Protection System for reactor trip on high temperature; also used to determine adequate core cooling, subcooling margin, and conditions for natural circulation cooldown.

- QUALIFICATION DISCREPANCY:

  According to Franklin, similarity, aging, accuracy, functional testing were not adequately evaluated.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The high temperature reactor trip function is performed within seconds, prior to any significant degradation postulated to occur from the harsh environmental conditions following a LOCA. In addition, low RCS pressure or high reactor building pressure provide diverse reactor trip functions following a LOCA.

  Incore thermocouples may be used to determine adequate core cooling, subcooling margin and conditions for natural circulation. Based on experience from the TMI-2 accident, incore thermocouples would be expected to survive the accident environment for sufficient time to provide this information.

  The temperature element itself has been subjected to 600°F and 3215 psig. The connector head assembly has been exposed to 80 psig and submerged to demonstrate leak tightness. According to B&W, the materials were chosen to withstand at least 240°F and 1×10^8 rads.

  AP&L recognizes that qualification must be fully demonstrated for these sensors, or fully qualified replacements (if available) will be required. AP&L is pursuing qualified replacement for these devices, but to date a suitable substitute has not been located.

  Based on the above, it is concluded that justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Coolant Cold Leg Temperature Element (RTD)

TAG NO(S).: TE 1016, TE 1017, TE 1045, TE 1047

SER RESPONSE PAGE NO(S).: A021, A022, A041, A042

FRC EQUIPMENT ITEM: 62 and 64

MANUFACTURER AND MODEL NO.: Rosemount 177JD

SYSTEM - P&ID NO.: Reactor Coolant System, M-230

LOCATION: Reactor Building

- SAFETY FUNCTION:

  These sensors are not inputs to Reactor Protection, Engineered Safeguards Actuation or Steam Line Break Isolation logic, therefore, perform no automatic mitigation function. Indication is provided to the control room for determining adequate core cooling, subcooling margin, and conditions for natural circulation cooldown.

- QUALIFICATION DISCREPANCY:

  Similarity, aging, accuracy, functional testing

- JUSTIFICATION FOR CONTINUED OPERATION:

  These sensors are not used to perform any automatic protective action, therefore their unavailability will not inhibit automatic emergency core cooling or reactor trip.

  Incore thermocouples may be used to determine adequate core cooling, subcooling margin and conditions for natural circulation. Based on experience from the TMI-2 accident, incore thermocouples would be expected to survive the accident environment for sufficient time to provide this information.

  The temperature element itself has been subjected to 600°F and 3215 psig. The connector head assembly has been exposed to 80 psig and submerged to demonstrate leak tightness. According to B&W, the materials were chosen to withstand at least 240°F and $1x10^8$ rads.

  AP&L recognizes that qualification must eventually be fully demonstrated for these sensors or fully qualified replacements (if available) will be required. AP&L is pursuing qualified replacements for these devices, but to date a suitable substitute has not been located.

  Based on the above analysis, it is concluded that justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Steam Generator Shell Water Temperature (Temperature Elements)

TAG NO(S).: TE 2614, TE 2615, TE 2664, TE 2665

SER RESPONSE PAGE NO(S).: A003, A004, A007, A008

FRC EQUIPMENT ITEM: 60

MANUFACTURER AND MODEL NO.: Rosemount 104 AFP

SYSTEM - P&ID NO.: Steam Generator Secondary - M206

LOCATION: Reactor Building

- SAFETY FUNCTION:

  This instrument is an RTD which measures OTSG feedwater downcomer temperature and is used in providing temperature compensation to the integrated control system.

- QUALIFICATION DISCREPANCY:

  Similarity, aging, accuracy, functional testing

- JUSTIFICATION FOR CONTINUED OPERATION:

  The component performs no function critical to safety. It is not used for reactor protection, engineered safeguards actuation, steam line break isolation, nor is it a safety-critical variable to monitor for emergency cooldown; therefore, it will be removed from the Master List of equipment requiring qualification.

  Based on the above, it is concluded that justification for continued operation has been demonstrated.

COMPONENT: Temperature Switch

TAG NO(S).: TS-7441A, -7441B

SER RESPONSE PAGE NO(S).: B128, B129

FRC EQUIPMENT ITEM: 90, 91

MANUFACTURER AND MODEL NO.: Fenwal 18001-21

SYSTEM - P&ID NO.: Reactor Building HVAC, M-261

LOCATION: Room 46

- SAFETY FUNCTION:

  To control the Hydrogen Purge System heaters VEH-6A and 6B during post-LOCA hydrogen purge operations.

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report, inadequate evidence was provided to identify the temperature switch tested in the report referenced by AP&L.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The environmental conditions listed on the worksheet represent those due to a High Energy Line Break for Room 46 (except for radiation); however, the device is needed for LOCA conditions only. Room 46 is a "mild" environment during a LOCA. The recirculation of LOCA fluids results in an insignificant radiation dose in Room 46. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne iodines from the containment, an exposure of 4.1×10^7 rads to this component must be considered.

  This dose assumes continuous purging after reaching 3.5% H_2 concentration; however, the purge unit could be secured when the concentrations are lowered to 3%. This is estimated to require approximately 10½ days. The concentration would not reach 3.5% again until after the 30 day operating time limit is exceeded. Therefore, the dose could be lowered significantly.

  If the purge system failed, the redundant train could be switched on. In addition, ANO has the capability for hookup to external hydrogen recombiners should they become necessary.

  AP&L is investigating further dose reductions by additional analysis. In any case, qualification will be demonstrated by the next refueling outage by replacement if necessary.

A materials breakdown of the temperature switch model used in ANO-1 is as follows:

Material Function	Material
a. Lead wire	Teflon impregnated tape, asbestos tape and glass braid
b. Temperature adjusting	Brass
c. Expanding shell	Stainless steel
d. Wall insulation	Ceramic
e. Terminal insulation	Mica
f. Contacts	Brass and copper
g. Hermetic seals	Glass

The only material with potential for significant radiation deterioration is teflon. However, the function of the teflon tape is to provide abrasion resistance to the wires (it does not function as an electrical insulator); therefore, the postulated loss of integrity of the teflon would not affect the functioning of the temperature switch.

Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Accelerometers for Pressurizer Relief Valve Position Monitoring

TAG NO(S).: VBE-1000 A&B, VBE-1001 A&B, VBE-1002 A&B

SER RESPONSE PAGE NO(S).: C001, C002, C005, C006, C009, C010

FRC EQUIPMENT ITEM: 130

MANUFACTURER AND MODEL NO.: Endevco 2273AM20

SYSTEM - P&ID NO.: Reactor Coolant, M-230

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Monitor pressurizer relief valve position. The system is used to determine safety or power operated relief valve position, for the purpose of determining possible loss of coolant or steam relief pathways.

- QUALIFICATION DISCREPANCY:

  All

- JUSTIFICATION FOR CONTINUED OPERATION:

  This component is a part of the acoustic monitoring system for pressurizer relief valve position, installed as a post-TMI retrofit in response to NUREG 0737. It performs no protective action. When purchased, it was believed to be among the best available for nuclear service.

  If this monitor failed to function during a LOCA caused by pressurizer steam-side relief, additional methods might be utilized for determining the source of the event:

  1. Pressurizer level increase without primary pressure and temperature increase.

  2. Safety and power relief valve tailpipe temperature increase.

  3. Quench tank level, pressure, and temperature increase.

  Should none of these indications be available, the emergency core cooling system will nevertheless protect the core without requiring identification of the leak pathway or valve position.

  Components are presently under testing to demonstrate environmental qualification.

  Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Preamplifiers for Pressurizer Relief Valve Position Monitoring

TAG NO(S).: VBY-1000 A&B, VBY-1001 A&B, VBY-1002 A&B

SER RESPONSE PAGE NO(S).: C003, C004, C007, C008, C011, C012

FRC EQUIPMENT ITEM: 135

MANUFACTURER AND MODEL NO.: Unholtz-Dicke 22CA-2TR

SYSTEM - P&ID NO.: Reactor Coolant, M-230

LOCATION: Reactor Building

- SAFETY FUNCTION:

  Monitor pressurizer relief valve position. The system is used to determine safety or power operated relief valve position, for the purpose of determining possible loss of coolant or steam relief pathways.

- QUALIFICATION DISCREPANCY:

  All

- JUSTIFICATION FOR CONTINUED OPERATION:

  This component is a part of the acoustic monitoring system for pressurizer relief valve position, installed as a post-TMI retrofit in response to NUREG 0737. It performs no protective action. When purchased, it was believed to be among the best available for nuclear service.

  If this monitor failed to function during a LOCA caused by pressurizer steam-side relief, additional methods might be utilized for determining the source of the event:

  1. Pressurizer level increase withiout primary pressure and temperature increase.

  2. Safety and power relief valve tailpipe temperature increase.

  3. Quench tank level, pressure, and temperature increase.

  Should none of these indications be available, the emergency core cooling system will nevertheless protect the core without requiring identification of the leak pathway or valve position.

  Components are presently under testing to demonstrate environmental qualification.

  Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Cooling Unit Fan Motors

TAG NO(S).: VSFM1A, VSFM1B, VSFM1C, VSFM1D

SER RESPONSE PAGE NO(S).: A069, A070, A071, A072

FRC EQUIPMENT ITEM: 123

MANUFACTURER AND MODEL NO.: Reliance Electric 42-26-1770, 42.45-26.5-1770 (Motor #600276-14)

SYSTEM - P&ID NO.: HVAC - Reactor Building - M-261

LOCATION: Reactor Building

- SAFETY FUNCTION:

  1. Provide Reactor Building Cooling During Normal and Emergency Plant Operation

  2. Maintain Reactor Building Pressure Below Design Value After a LOCA

- QUALIFICATION DISCREPANCY:

  Documented evidence of qualification unavailable.

- JUSTIFICATION FOR CONTINUED OPERATION:

  Taken together, the four reactor building cooling units are 100% redundant to the Reactor Building Spray (RBS) System in performing this safety function. Alternatively, any two of the reactor building cooling units together with 50% of the RBS system can maintain reactor building pressure below the design value following a LOCA.

  Documentation and walkdowns at ANO-1 verified all four motors have type N insulation. Equipment similarity has been established to motors with the following qualification capability:

Temperature	-	300°F for 3-4 hours followed by a gradual reduction to 200°F	type test
Pressure	-	80 psig for 3-4 hours followed by a gradual reduction to 20 psig	type test
Relative Humidity	-	100%	type test
Radiation	-	1×10^9 rads	materials analysis

In addition, the design life of the equipment is 40 years normal operation plus one year LOCA and post-LOCA.

The motors are considered qualified, and justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Analyzer

TAG NO(S).: C-178

SER RESPONSE PAGE NO(S).: B125

FRC EQUIPMENT ITEM: 133

MANUFACTURER AND MODEL NO.: Delphi BIA-1A1B9D

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 46

- SAFETY FUNCTION:

  The safety function of the hydrogen analyzer is to determine the hydrogen concentration in the Reactor Building after a LOCA.

- QUALIFICATION DISCREPANCY:

  According to Franklin, the documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies for the hydrogen analyzer result from a HELB outside containment. Since this system needs to operate only after a LOCA, the required safety function of the hydrogen analyzer is not jeopardized.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 1.3×10^7 rads to this component must be considered.

  The dose mentioned would not be present at the beginning of purge operations; therefore, the ability to monitor H_2 concentration is not compromised until significant purging has taken place. Since the capability of the purge system to remove hydrogen is well documented, once purging has begun the rate of H_2 concentration decrease can be approximated. If the effectiveness of H_2 sampling (accuracy) later became suspect, the redundant sampler could be utilized. This backup sampler would not have been exposed to significant doses and would therefore be reliable. In addition, ANO has the capability to hook up to external recombiners if necessary.

  AP&L is investigating additional analysis which is expected to reduce the actual radiation exposure to this component. AP&L recognizes the need to demonstrate full qualificaiton for this device; therefore, if necessary, a fully qualified replacement will be installed (if available) by the next refueling outage.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Analyzer

TAG NO(S).: C-179

SER RESPONSE PAGE NO(S).: B126

FRC EQUIPMENT ITEM: 134

MANUFACTURER AND MODEL NO.: Delphi BIA-1A1B9D

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  The safety function of the hydrogen analyzer is to determine the hydrogen concentration in the Reactor Building after a LOCA.

- QUALIFICATION DISCREPANCY:

  According to FRC, the documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies except for radiation occur during a HELB outside Reactor Building. Since this system has no safety related operation during a HELB event, failure during this event does not jeopardize plant safety.

  The discrepancy due to radiation results from the one year integrated dose of $5x10^5$ rads that the hydrogen analyzer was determined to receive from recirculation of LOCA fluids.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 2.3×10^6 rads to this component must be considered.

  The dose mentioned would not be present at the beginning of purge operations; therefore, the ability to monitor H_2 concentration is not compromised until signficant purging has taken place. Since the capability of the purge system to remove hydrogen is well documented, once purging has begun the rate of H_2 concentration decrease can be approximated. If the effectiveness of H_2 sampling (accuracy) later became suspect, the redundant sampler could be utilized. This backup sampler would not have been exposed to significant doses and would therefore be reliable. In addition, ANO has the capability to hook up to external recombiners if necessary.

AP&L is investigating additional analysis which is expected to reduce the actual radiation exposure to this component. AP&L recognizes the need to demonstrate full qualification for this device; therefore, if necessary, a fully qualified replacement will be installed (if available) by the next refueling outage.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Analyzer Gas Sample Blower

TAG NO(S).: CM-19A

SER RESPONSE PAGE NO(S).: B119

FRC EQUIPMENT ITEM: 121

MANUFACTURER AND MODEL NO.: Reliance 708933-DY

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 46

- SAFETY FUNCTION:

  CM-19A is the lead hydrogen analyzer gas sample blower. This blower provides the suction required to obtain a sample of the Reactor Building atmosphere for the hydrogen analyzing system. CM-19A is manually controlled.

- QUALIFICATION DISCREPANCY:

  According to FRC, the documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies for CM-19A result from a HELB outside the Reactor Building. Since the hydrogen gas smapling system needs to operate only after a LOCA, the required safety function of CM-19A is not jeopardized.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 1.3×10^7 rads to this component must be considered.

  The dose mentioned would not be present at the beginning of purge operations; therefore, the ability to monitor H_2 concentration is not compromised until signficant purging has taken place. Since the capability of the purge system to remove hydrogen is well documetned, once purging has begun the rate of H_2 concentration decrease can be approximated. If the effectiveness of H_2 sampling (accuracy) later became suspect, the redundant sampler could be utilized. This backup sampler would not have been exposed to significant doses and would therefore be reliable. In addition, ANO has the capability to hook up to external recombiners if necessary.

  AP&L is investigating additional analysis which is expected to reduce the actual radiation exposure to this component. AP&L recognizes the need to demonstrate full qualification for this device; therefore, if necessary, a fully qualified replacement will be installed (if available) by the next refueling outage.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Analyzer Gas Sample Blower

TAG NO(S).: CM-19B

SER RESPONSE PAGE NO(S).: B120

FRC EQUIPMENT ITEM: 122

MANUFACTURER AND MODEL NO.: Reliance 708933-DY

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  CM-19B is the stand-by hydrogen analyzer gas sample blower. This blower provides the suction required to obtain a sample of the Reactor Building atmosphere for the hydrogen analyzing system. CM-19B is manually controlled.

- QUALIFICATION DISCREPANCY:

  According to FRC, the documented evidence of qualification is inadquate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  All the qualification discrepancies for CM-19B, except for the one resulting from radiation, result from a HELB outside of the Reactor Building. Since the hydrogen gas sampling system needs to operate only after a LOCA, the required safety operation of CM-19B is not jeopardized due to a HELB.

  The discrepancy due to radiation results from the 30-day integrated dose to CM-19B from recirculation of LOCA fluids of 5×10^5 rads

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 1.8×10^6 rads to this component must be considered.

  The dose mentioned would not be present at the beginning of purge operations; therefore, the ability to monitor H_2 concentration is not compromised until significant purging has taken place. Since the capability of the purge system to remove hydrogen is well documented, once purging has begun the rate of H_2 concentration decrease can be approximated. If the effectiveness of H_2 sampling (accuracy) later became suspect, the redundant sampler could be utilized. This backup sampler would not have been exposed to significant doses and would therefore be reliable. In addition, ANO has the capability to hook up to external recombiners if necessary.

AP&L is investigating additional analysis which is expected to reduce the actual radiation exposure to this component. AP&L recognizes the need to demonstrate full qualification for this device, therefore, if necessary, a fully qualified replacement will be installed (if available) by the next refueling outage.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Decay Heat Removal System Cooler E35B Isolation Motor Operated Valve and Internal Position Switch

TAG NO(S).: CV-1400

SER RESPONSE PAGE NO(S).: B082

FRC EQUIPMENT ITEM: 24

MANUFACTURER AND MODEL NO.: Limitorque SMB-3-100

SYSTEM - P&ID NO.: Decay Heat Removal System M-232

LOCATION: Room 79

- SAFETY FUNCTION:

  CV-1400 is required to open on an Engineered Safeguards Actuation System (ESAS) Low Pressure Injection signal thus permitting Low Pressure Injection Pump P34B to inject borated water into the reactor vessel. Per an emergency procedure for LOCA, CV-1400 is later throttled to keep P34B from operating at run out for long periods of time.

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between installed and tested device not established, aging not adequately demonstrated, and criteria regarding radiation not satisfied.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between tested device and installed device without documentation from Limitorque. AP&L has the documentation necessary to establish the similarity and has confirmed similarity between the installed and tested device. The applicable test report is B0003.

  Previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filer 100% of the airborne Iodines from the containment, an exposure of 4.1×10^7 rads to this component must be considered.

  The major portion of the radiation dose specified for the valve results from recirculating fluid from the Reactor Building sump back to the reactor vessel. This fluid is the Reactor Coolant postulated to be released as a result of a LOCA. CV-1400 is normally closed and opens after receiving an ESAS signal. The initial fluid going through the valve is uncontaminated borated water from the Borated Water Storage Tank (BWST). Fluid flow through the valve increases as reactor coolant pressure decreases until the operator is required to throttle CV-1400 to

avoid Low Pressure Injection pump suction to the contaminated fluid in the reactor building sump. Therefore all required valve operation is completed before the valve experiences a dose in excess of its qualified dose, and before the specified time of 30 days. In addition, this occurs before the Hydrogen purging operations and therefore the device would not be affected by the purge filter contamination.

The applicable radiation exposure of the tested device is 2 E7 rads which is lower than the "required" dose.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Decay Heat Removal System Cooler E35A Isolation Motor Operated Valve and Internal Position Switch

TAG NO(S).: CV-1401

SER RESPONSE PAGE NO(S).: B083

FRC EQUIPMENT ITEM: 24

MANUFACTURER AND MODEL NO.: Limitorque SMB-3-100

SYSTEM - P&ID NO.: Decay Heat Removal System M-232

LOCATION: Room 79

- SAFETY FUNCTION:

  CV-1401 is required to open on an Engineered Safeguards Actuation System Low Pressure Injection signal thus permitting P34A to inject borated water into the reactor vessel. Per emergency procedure for LOCA, CV-1401 is later throttled to keep P34A from operating at run out for long periods of time.

- QUALIFICATION DISCREPANCY:

  According to FRC, qualification of this device is deficient in the following areas: Similarity between tested and installed device not established, aging not adequately evaluated, and radiation criteria not satified.

- JUSTIFICATION FOR CONTINUED OPERATION:

  FRC could not have affirmed or denied similarity between installed and tested device without the necessary documentation from Limitorque which ties the installed device (identified by serial number and Limitorque order number) to the appropriate Limitorque qualification test report. This data was not previously provided to FRC; however, we have rechecked the documentation and confirmed the similarity of the installed device to the tested device (Limitorque test report B0003).

  The dose to this item due to recirculation of LOCA fluids is 1.9E7 rads; however, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge until in Room 79 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of 1.0 E6 rads to this component must be considered for a total dose of approximately 2.0 E7 rads which is the qualified level per Limitorque Test Report B0003.

  In any case, since similarity has been established, aging requirements are considered satisfied by Limitorque report B0058; therefore, we consider the device fully qualified.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Penetration Room Filter Suction Valve Actuator

TAG NO(S).: CV-2123, CV-2133

SER RESPONSE PAGE NO(S).: B169, B175

FRC EQUIPMENT ITEM: 154

MANUFACTURER AND MODEL NO.: ITT General 9210

SYSTEM - P&ID NO.: Reactor Building Penetration Room Ventilation M-264

LOCATION: Room 47

- SAFETY FUNCTION:

  On receipt of an Engineered Safeguards Actuation System (ESAS) Reactor Building isolation signal, the lead fan VEF-38A is energized and CV-2123 is opened. If after 20 seconds there is not proper flow through the lead system, VEF-38A is stopped and CV-2123 closed due to another ESAS Reactor Building isolation signal. This signal also energizes VEF-38B and opens CV-2133 to allow operation of the standby system.

- QUALIFICATION DISCREPANCY:

  According to Franklin, the documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancy for these valves results from a High Energy Line Break (HELB) outside the Reactor Building. Since the safety function of these valves requires operability for 30 days after a LOCA, which occurs inside the Reactor Building, the required safety operation of the valve is not jeopardized.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the penetration room filters. If the ventilation system is assumed to filter 50% of the containment airborne Iodines, an exposure of 6.5 E5 and 4.9 E5 rads for CV-2123 and CV-2133 must be considered.

  AP&L had previously determined that these items performed their functions in the mild environment; however, considering this recent development concerning radiation dose, AP&L is in the process of confirming qualification to the higher dose level. Preliminary indications are that these valves are qualified to 8×10^6 rads.

  AP&L will confirm the qualification or replace the devices with qualified substitutes (if available) by the next refueling outage.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Penetration Room Filter Minimum Flow Valve Actuator

TAG NO(S).: CV-2126

SER RESPONSE PAGE NO(S).: B171

FRC EQUIPMENT ITEM: 154

MANUFACTURER AND MODEL NO.: ITT General 9210

SYSTEM - P&ID NO.: Reactor Building Penetration Room Ventilation System Airflow M-264

LOCATION: Room 47

- SAFETY FUNCTION:

  Airflow must be circulated, at a minimum of 40 scfm, through an iodine-charcoal filter to prevent the filter from reaching a combustion temperature of 650°F and igniting. After the lead filtration system has operated for a long time, resulting in high radiation levels at the filter discharge, the stand-by system can be initiated. By opening CV-2126, minimum flow is maintained through the lead system filter by the operating stand-by system.

- QUALIFICATION DISCREPANCY:

  According to Franklin, the documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancy for CV-2126 results from a HELB outside the Reactor Building. Since the safety function of the valve requires operability within 30 days after a LOCA, which occurs inside of the Reactor building, the required safety operation of the valve is not operated.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the penetration room filters. If the ventilation system is assumed to filter 50% of the containment airborne Iodines, an exposure of 1.5×10^6 rads for CV-2126 must be considered.

  AP&L had previously determined that these items performed their functions in the mild environment; however, considering this recent development concerning radiation dose, AP&L is in the process of confirming qualification to the higher dose level. Preliminary indications are that these valves are qualified to 8×10^6 rads.

  AP&L will confirm the qualification or replace the devices with qualified substitutes (if available) by the next refueling outage.

Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Penetration Room Filter Minimum Flow Valve Actuator

TAG NO(S).: CV-2136

SER RESPONSE PAGE NO(S).: B177

FRC EQUIPMENT ITEM: 154

MANUFACTURER AND MODEL NO.: ITT General 9210

SYSTEM - P&ID NO.: Reactor Building Penetration Room Ventilation System Airflow M-264

LOCATION: Room 47

- SAFETY FUNCTION:

  Airflow must be circulated, at a minimum of 40 scfm, through an iodine-exposed charcoal filter to prevent the filter from reaching a combustion temperature of 650°F and igniting. If the standby filtration system has operated for a long time, resulting in high radiation levels at the filter discharge, the lead system can be initiated. By opening CV-2136, minimum flow is maintained through the stand-by system filter by the operating lead system.

- QUALIFICATION DISCREPANCY:

  According to Franklin, the documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancy for CV-2136 results from a HELB outside the Reactor Building. Since the safety fucntion of the valve requires operability within 30 days after a LOCA, which occurs inside of the Reactor Building, the required safety operation of the valve is not jeopardized.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the penetration room filters. If the ventilation system is assumed to filter 50% of containment airborne Iodines, an exposure of 1.5 E6 rads for CV-2136 must be considered.

  AP&L had previously determined that these items performed their functions in the mild environment; however, considering this recent development concerning radiation dose, AP&L is in the process of confirming qualification to the higher dose level. Preliminary indications are that these valves are considered qualified to 8×10^6 rads.

  AP&L will confirm the qualification or replace the devices with qualified substitutes (if available) by the next refueling outage.

Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge Air System Exhaust Fan Seal Water Pressure Switch

TAG NO(S).: PS-7500

SER RESPONSE PAGE NO(S).: B143

FRC EQUIPMENT ITEM: 84

MANUFACTURER AND MODEL NO.: Barksdale D2T-M150SS

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 46

- SAFETY FUNCTION:

  This switch allows operation of the Hydrogen Purge air system lead exhaust fan only if the seal water pressure for this fan is greater than the set point of 35 psig.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies (except for radiation) for PS-7500 result from a HELB outside the Reactor Building. Since the Hydrogen Purge Air system needs to operate only after a LOCA, the required safety function of PS-7500 is not jeopardized.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 9.5E6 rads to this component must be considered.

  If the purge system failed, the redundant train could be switches on. In addition, ANO has the capability for hookup to external hydrogen recombiners should they become necessary.

  AP&L is investigating further dose reductions by additional analysis. in any case, qualification will be demonstrated by the next refueling outage by replacement if necessary.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge Air System Exhaust Fan Seal Water Pressure Switch

TAG NO(S).: PS-7501

SER RESPONSE PAGE NO(S).: B145

FRC EQUIPMENT ITEM: 83

MANUFACTURER AND MODEL NO.: Barksdale D2T-M150SS

SYSTEM - P&ID NO.: HVAC - Reactor Buildling M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  This switch allows operation of the Hydrogen Purge Air system stand-by exhaust fan only if the seal water for the fan is greater than the set point of 35 psig.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  All of the qualification discrepancies for PS-7501 except for the one due to radiation, result from HELB outside of the Reactor Building. Since the Hydrogen Purge Air system needs to operate only after a LOCA, the required safety operation of PS-7501 is not jeopardized due to HELB.

  The discrepancy due to radiation results from the dose of 8×10^5 rads due to recirculation of LOCA fluids.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 7.2×10^7 rads to this component must be considered.

  This dose assumes continuous purging after reaching 3.5% H_2 concentration; however, the purge unit could be secured when the concentrations are lowered to 3%. This is estimated to required approximately 10½ days. The concentration would not reach 3.5% again until after the 30-day operating time limit is exceeded. Therefore, the dose could be lowered significantly.

  If the purge system failed, the redundant train could be switched on. In addition, ANO has the capability for hookup to external hydrogen recombiners should they become necessary.

AP&L is investigating further dose reductions by additional analysis. In any case, qualification will be demonstrated by the next refueling outage by replacement if necessary.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge Air System Supply Fan Seal Water Pressure Switch

TAG NO(S).: PS-7502

SER RESPONSE PAGE NO(S).: B147

FRC EQUIPMENT ITEM: 84

MANUFACTURER AND MODEL NO.: Barksdale D2T-M150SS

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 46

- SAFETY FUNCTION:

  The switch allows operation of the hydrogen purge air system lead supply fan only if the seal water pressure for this fan is greater than the set point of 35 psig.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies (except for radiation) for PS-7502 result from a HELB outside the Reactor Building. Since the Hydrogen Purge Air system needs to operate only after a LOCA, the required safety function of PS-7502 is not jeopardized.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 1.8×10^7 rads to this component must be considered.

  This dose assumes continuous purging after reaching 3.5% H_2 concentration; however, the purge unit could be secured when the concentrations are lowered to 3%. This is estimated to require approximately 10½ days. The concentration would not reach 3.5% again until after the 30-day operating time limit is exceeded. Therefore, the dose could be lowered significantly.

  If the purge system failed, the redundant train could be switched on. In addition, ANO has the capability for hookup to external hydrogen recombiners should they become necessary.

  AP&L is investigating further dose reductions by additional analysis. In any case, qualification will be demonstrated by the next refueling outage by replacement if necessary.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge Air System Supply Fan Seal Water Pressure Switch

TAG NO(S).: PS-7503

SER RESPONSE PAGE NO(S).: 6149

FRC EQUIPMENT ITEM: 83

MANUFACTURER AND MODEL NO.: Barksdale D2T-M150SS

SYSTEM - P&ID NO.: HVAC-Reactor Building M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  This switch allows operation of the Hydrogen Purge Air system stand-by supply fan only if the seal water pressure for the fan is greater than the set point of 35 psig.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  All of the qualification discrepancies for PS-7503 except for the one due to radiation, result from a HELB outside of the Reactor Building. Since the Hydrogen Purge Air system needs to operate only after a LOCA, the required safety operation of PS-7503 is not jeopardized due to HELB.

  The disrepancy due to radiation results from the dose of 8×10^5 rads due to recirculation of LOCA fluids.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 1.0×10^7 rads to this component must be considered.

  This dose assumes continuous purging after reaching 3.5% H_2 concentration; however, the purge unit could be secured when the concentrations are lowered to 3%. This is estimated to require approximately 10½ days. The concentration would not reach 3.5% again until after the 30-day operating time limit is exceeded. Therefore, the dose could be lowered significantly.

  If the purge system failed, the redundant train could be switched on. In addition, ANO has the capability for hookup to external hydrogen recombiners should they become necessary.

AP&L is investigating further dose reductions by additional analysis. In any case, qualification will be demonstrated by the next refueling outage by replacement if necessary.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge Air System Exhaust Radiation Monitor

TAG NO(S).: RE-7442

SER RESPONSE PAGE NO(S).: B131

FRC EQUIPMENT ITEM: 136

MANUFACTURER AND MODEL NO.: Eberline Sping 4

SYSTEM - P&ID NO.: Reactor Building M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  The safety function of RE-7442 is to monitor the radiation level of the air leaving the reactor building via the hydrogen purge exhaust line.

- QUALIFICATION DISCREPANCY:

  According to Franklin, the documented evidence of qualification in inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The only outstanding qualification discrepancy for RE-7442 is the specified one year integrated dose. Two main contributors, in room 79, were identified for this dose. The major contributor is the dose due to recirculation of LOCA fluids. The second is due to dose buildup in the hydrogen purge filters. The total dose is postulated to approach 1.9×10^6 rads. Recent systems review have determined that these device perform no essential safety functions and are available for monitoring only.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Primary Coolant Quench Tank Sampling Isolation Solenoid Valve

TAG NO(S).: SV-1845

SER RESPONSE PAGE NO(S).: B115

FRC EQUIPMENT ITEM: 42

MANUFACTURER AND MODEL NO.: ASCO LB 8320 A8

SYSTEM - P&ID NO.: Sampling System M-237

LOCATION: Room 79

- SAFETY FUNCTION:

  SV-1845 is the actuator solenoid for CV-1845, the primary coolant quench tank sampling isolation valve. Its safety function is to de-energize on receipt of Reactor Building isolation signal from the Engineered Safeguards Actuation System (ESAS), which closes CV-1845.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  SV-1845 is required to close CV-1845 on pressure inside the Reactor Building of > 4 psig. The harsh environment leading to its failure is the result of a reactor coolant letdown line break outside of the Reactor Building, for which CV-1845 has no safety function.

  This device is required to perform an isolation function only. The valve de-energizes to close upon ESAS signal and is not required to reopen. The radiation exposure to the valve over the required operating time is only 3.5×10^4 which is considered non-harsh. Therefore this device is considered to be in a mild environment.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Penetration Room Isolation Solenoid Valves

TAG NO(S).: SV-2100, SV-2101, SV-2102, SV-2103, SV-2104, SV-2105, SV-2106

SER RESPONSE PAGE NO(S).: B153, B157, B161, B165, B155, B159, B163

FRC EQUIPMENT ITEM: 41, 43 and 49

MANUFACTURER AND MODEL NO.: ASCO 8321A5

SYSTEM - P&ID NO.: Reactor Building Penetration Room Ventilation M-264

LOCATION: Room 79

- SAFETY FUNCTION:

  The safety function for these solenoid valves is to isolate the penetration rooms from their normal ventilation system

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies occur during a HELB outside the Reactor Building. Since these valves have no safety related operation during a HELB, failure during this event does not jeopardize plant safety.

  The required operating time for these devices is only one minute; therefore, the dose due to recirculation of LOCA fluids is not applicable. The valves de-energize to close and once closed, no failure has been identified which can cause the valves to open. The applicable radiation dose is 3.5 E4 rads which is non-harsh; therefore, these devices are in a mild environment.

  Base on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Service Water Cooling Coils Isolation Valve

TAG NO(S).: SV-3814

SER RESPONSE PAGE NO(S).: B037

FRC EQUIPMENT ITEM: 47

MANUFACTURER AND MODEL NO.: ASCO LB-80173

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 46

- SAFETY FUNCTION:

  SV-3814 is required to energize to open CV-3814 upon receipt of a reactor building isolation signal from Engineered Safeguards Actuation System (ESAS). CV-3814 is the reactor building service water cooling coils (VCC-2A and VCC-2B) discharge isolation valve.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  SV-3814 is required to energize for an initating event occurring inside of the Reactor Building. For this event, SV-3814 which is located outside of the Reactor Building, will not experience a harsh environment. SV-3814 will be subjected to a harsh environment only following a reactor coolant letdown line break or a HELB outside of the Reactor Building, for which SV-3814 has no safety function.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 8.4E5 rads to this component must be considered.

  The Hydrogen Purge System is not required to operate during the first 11.5 days following a LOCA (Re: FSAR Section 6.6). Therefore, the Hydrogen Purge Unit filters will not provide radiation exposure to SV-3814 during this period. At the time the Hydrogen Purge System is placed in service, the Reactor Building pressure and temperature will have returned to near normal conditions (Re: FSAR Figure 14-61) via operation of the Reactor Building Coolers and Spray System.

In addition, as noted in FSAR Section 6.3.3, the Reactor Building Spray System provides a redundant means of Reactor Building heat removal.

AP&L will demonstrate full qualification of this device or replace it with a fully qualified substitute by the next refueling outage.

Based on the above, justification for continued operation is demonstrated.

COMPONENT: Reactor Building Service Water Cooling Coils Isolation Valve

TAG NO(S).: SV-3815

SER RESPONSE PAGE NO(S).: B039

FRC EQUIPMENT ITEM: 48

MANUFACTURER AND MODEL NO.: ASCO LB80173

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 79

- SAFETY FUNCTION:

  SV-3815 is required to energize to open CV-3815 upon receipt of a reactor building isolation signal from Engineering Safeguards Actuation System (ESAS). CV-3815 is the reactor building service water cooling coils (VCC 2C and VCC 2D) discharge isolation valve.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  SV-3815 is required to provide its safety function for an initiating event occurring inside of the Reactor Building. For this event, SV-3815, which is located outside of the Reactor Building, will not experience a harsh environment. SV-3815 will be subjected to a harsh environment only following a Reactor Coolant letdown line break or a Main Feedwater line break, for which SV-3815 has no safety function. The other outstanding qualification discrepancy for SV-3815 is the specified one year integrated radiation dose. Two main contributors in Room 79 were identified for this dose. The major contributor is the dose due to recirculation of LOCA fluids of 4.2×10^6 rads.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 1.8×10^6 rads to this component must be considered.

  The Hydrogen Purge System is not required to operate during the first 11.5 days following a LOCA (Re: FSAR Section 6.6). Therefore, the Hydrogen Purge Unit filters will not provide radiation exposure to SV-3814 during this period. At the time the Hydrogen Purge System is placed in service,

the Reactor Building pressure and temperature will have returned to near normal conditions (Re: FSAR Figure 14-61) via operation of the Reactor Building Coolers and Spray System.

In addition, as noted in FSAR Section 6.3.3, the Reactor Building Spray System provides a redundant means of Reactor Building heat removal.

AP&L will demonstrate full qualification of this device or replace it with a fully qualified substitute by the next refueling outage.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Temperature Switch

TAG NO(S).: TS-7442A, -7442B

SER RESPONSE PAGE NO(S).: B132, B133

FRC EQUIPMENT ITEM: 89

MANUFACTURER AND MODEL NO.: Fenwal 18002-21

SYSTEM - P&ID NO.: Reactor Building HVAC, M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  To control the Hydrogen Purge System heaters VEH-6A and 6B during post-LOCA hydrogen purge operations.

- QUALIFICATION DISCREPANCY:

  According to the Franklin Technical Evaluation Report, inadequate evidence was provided to identify the temperature switch tested in the report referenced by AP&L

- JUSTIFICATION FOR CONTINUED OPERATION:

  The environmental conditions listed on the worksheet represent those due to a High Energy Line Break for Room 79 (except for radiation); however, the device is needed for LOCA conditions only. Room 46 is a "mild" environment during a LOCA. The recirculation of LOCA fluids results in a radiation dose of 2.7×10^6 in Room 79. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of 7.2×10^7 rads to this component must be considered.

  This dose assumes continuous purging after reaching 3.5% H_2 concentration; however, the purge unit could be secured when the concentrations are lowered to 3%. This is estimated to require approximately 10½ days. The concentration would not reach 3.5% again until after the 30 day operating time limit is exceeded. Therefore, the dose could be lowered significantly.

  If the purge system failed, the redundant train could be switched on. In addition, ANO has the capability for hookup to external hydrogen recombiners should they become necessary.

AP&L is investigating further dose reductions by additional analysis. In any case, qualification will be demonstrated by the next refueling outage by replacement if necessary.

A materials breakdown of the temperature switch model used in ANO-1 is as follows:

	Material Function	Material
a.	Lead wire	Teflon impregnated tape, asbestos tape and glass braid
b.	Temperature adjusting	Brass
c.	Expanding shell	Stainless steel
d.	Wall insulation	Ceramic
e.	Terminal insulation	Mica
f.	Contacts	Brass and copper
g.	Hermetic seals	Glass

The only material with potential for significant radiation deterioration is teflon. However, the function of the teflon tape is to provide abrasion resistance to the wires (it does not function as an electrical insulator); therefore, the postulated loss of integrity of the teflon would not affect the functioning of the temperature switch.

Based on the above, justification for continued operation has been demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge Air System Exhaust Blower

TAG NO(S).: VEFM-37A

SER RESPONSE PAGE NO(S).: B123

FRC EQUIPMENT ITEM: 120

MANUFACTURER AND MODEL NO.: General Electric 5K213AN1300

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 46

- SAFETY FUNCTION:

  VEFM-37A powers the lead Hydrogen Purge Air system exhaust fan, which may be required to operate after a LOCA.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies for VEFM-37A result from a HELB outside the Reactor Building. Since the Hydrogen Purge Air system needs to operate only after a LOCA, the required safety function of VEFM-37A is not jeoparidized.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 1.5×10^7 rads to this component must be considered.

  AP&L did not previously complete the documentation of qualification for this item since it was considered to be in a mild environment; however, since the recent development of additional radiation dose, AP&L is establishing full qualification. The motors can be demonstrated qualified to 2×10^8 rads per recent analysis.

  Based on the above, justifications for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge Air System Exhaust Blower Motor

TAG NO(S).: VEFM-37B

SER RESPONSE PAGE NO(S).: B124

FRC EQUIPMENT ITEM: 119

MANUFACTURER AND MODEL NO.: General Electric 5K213AN1300

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  VEFM-37B drives the stand-by Hydrogen Purge Air system exhaust fan, which may be required to operate after a LOCA.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  All the qualification discrepancies for VEFM-37B, except for the one due to radiation, result from a HELB outside of the Reactor Building. Since the Hydrogen Purge Air system needs to operate only after a LOCA, the required safety operation of VEFM-37B is not jeopardized due to a HELB.

  The discrepancy due to radiation results from the dose of 2.2×10^6 rads due to recirculation of LOCA fluids.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 7.2×10^7 rads to this component must be considered.

  Since the recent development of additional radiation dose, AP&L is establishing full qualification for this item. The motors can be demonstrated qualified to 2×10^8 rads per recent analysis.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Penetration Room Ventilation Fan Motor

TAG NO(S).: VEFM-38A, -38B

SER RESPONSE PAGE NO(S).: B151, B152

FRC EQUIPMENT ITEM: 124

MANUFACTURER AND MODEL NO.: Westinghouse 58DP

SYSTEM - P&ID NO.: Reactor Building Penetration Room Ventilation M-264

LOCATION: Room 47

- SAFETY FUNCTION:

  The safety function of these fan motors is to assure that air leakage from the Reactor Building through the penetrations passes through high efficiency filters. Removal of radioactive materials before the air is released to the environment, is thereby insured.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies for these fan motors result from a HELB outside the Reactor Building. Since the safety function of the fan motor is to control reactor building leakage after a LOCA, the required safety operation of the fan motor is not jeopardized.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Penetration Room Ventilation filters. If the unit in Room 47 is conservatively assumed to filter 50% of the airborne Iodines from the containment, an exposure of 2.7×10^6 rads to this components must be considered.

  AP&L did not previously complete the documentation of qualification for this item since it was considered to be in a mild environment; however, since the recent development of additional radiation dose, AP&L is establishing full qualification. The motors can be demonstrated qualified to 2×10^8 rads per recent analysis.

  Based on the above, justification for continued operation is demonstrated.

COMPONENT: Hydrogen Purge Exhaust Dehumidifier

TAG NO(S).: VEH-6A

SER RESPONSE PAGE NO(S).: B117

FRC EQUIPMENT ITEM: 131

MANUFACTURER AND MODEL NO.: CVI (Pennwalt) A90758D111

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 46

- SAFETY FUNCTION:

  The safety function of VEH-6A is to dehumidify the Reactor Building gases prior to their passage through the exhaust filter of the lead Hydrogen Purge Air System.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies (except for radiation) for VEH-6A result from a HELB outside the Reactor Building. Since this system needs to operate only after a LOCA, the required safety function of VEH-6A is not jeopardized by an HELB.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 2.8×10^7 rads to this component must be considered.

  This dose assumes continuous purging after reaching 3.5% H_2 concentration; however, the purge unit could be secured when the concentrations are lowered to 3%. This is estimated to require approximately 10½ days. The concentration could not reach 3.5% again until after the 30 day operating time limit is exceeded. Therefore, the dose could be lowered significantly.

  If the purge system failed, due to dose buildup from the filters, the redundant train could be switched on. In addition, ANO has the capability for hookup to external hydrogen recombiners should they become necessary.

AP&L is investigating further dose reductions by additional analysis. In any case, qualification will be demonstrated by the next refueling outage by replacement if necessary.

Based on the above, justification for continued operation is demonstrated.

COMPONENT: Hydrogen Purge Exhaust Dehumidifier

TAG NO(S).: VEH-6B

SER RESPONSE PAGE NO(S).: B118

FRC EQUIPMENT ITEM: 132

MANUFACTURER AND MODEL NO.: CVI (Pennwalt) A90758D111

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  The safety function of VEH-6B is to dehumidify the Reactor Building gases prior to their passage through the exhaust filter of the stand-by Hydrogen Purge Air system.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies occur during a HELB outside the Reactor Building. Since this system has no safety related operation during a HELB event, failure during this event does not jeopardize plant safety.

  The discrepancy due to radiation results from the recirculation of LOCA fluids which causes an exposure of 3.3×10^6 rads. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 7.2×10^7 rads to this component must be considered.

  This dose assumes continuous purging after reaching 3.5% H_2 concentration; however, the purge unit could be secured when the concentrations are lowered to 3%. This is estimated to require approximately 10½ days. The concentration could not reach 3.5% again until after the 30 day operating time limit is exceeded. Therefore, the dose could be lowered significantly.

  If the purge system failed, due to dose buildup from the filters, the redundant train could be switched on. In addition, ANO has the capability for hookup to external hydrogen recombiners should they become necessary.

AP&L is investigating further dose reductions by additional analysis. In any case, qualification will be demonstrated by the next refueling outage by replacement if necessary.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge Air System Supply Blower

TAG NO(S).: VSFM-30A

SER RESPONSE PAGE NO(S).: B121

FRC EQUIPMENT ITEM: 120

MANUFACTURER AND MODEL NO.: General Electric 5K213AN1300

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 46

- SAFETY FUNCTION:

  VSFM-30A drives the lead Hydrogen Purge Air system supply fan, which may be required to operate after a LOCA.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies for VSFM-30A result from a HELB outside the Reactor Building. Since the Hydrogen Purge Air system needs to operate only after a LOCA, the required safety function of VSFM-30A is not jeopardized. Furthermore, VSFM-30B is a redundant component for VSFM-30A.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 1.3×10^7 rads to this component must be considered.

  AP&L did not previously complete the documentation of qualification for this item since it was considered to be in a mild environment; however, since the recent development of additional radiation dose, AP&L is establishing full qualification. The motors can be demonstrated qualified to 2×10^8 rads per recent analysis.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge Air System Supply Blower Motor

TAG NO(S).: VSFM-30B

SER RESPONSE PAGE NO(S).: B122

FRC EQUIPMENT ITEM: 120

MANUFACTURER AND MODEL NO.: General Electric 5K213AN1300

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 79

- SAFETY FUNCTION:

  VSFM-30B drives the stand-by Hydrogen Purge Air system supply fan, which may be required to operate after a LOCA.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  All the qualification discrepancies for VSFM-30B, except for the one due to radiation, result from a HELB outside of the Reactor Building. Since the Hydrogen Purge Air system needs to operate only after a LOCA, the required safety operation of VSFM-30B is not jeoparized due to a HELB.

  The discrepancy due to radiation results from the dose due to recirculation of LOCA fluids of 1.1×10^6 rads.

  In addition, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 1.0×10^7 rads to this component must be considered.

  This device is located in a mild environment except for the postulated radiation environment. AP&L has established by detailed material analysis that these motors are qualified to levels in excess of 2×10^8 rads; therefore, the motors are considered fully qualified.

  Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Primary Coolant Quency Tank Sampling Isolation Valve Position Switch

TAG NO(S).: ZS-1845

SER RESPONSE PAGE NO(S).: B116

FRC EQUIPMENT ITEM: 75

MANUFACTURER AND MODEL NO.: Micro BZE62RN

SYSTEM - P&ID NO.: Sampling System M-237

LOCATION: Room 79

- SAFETY FUNCTION:

  ZS-1845 is the position indicator on valve CV-1845, the primary coolant quench tank sampling isolation value. Its safety function is to give the operator verification of CV-1845 closure.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  ZS-1845 is required to verify CV-1845 position after isolation closure, which occurs on pressure inside the Reactor Building > 4 psig. The harsh environment leading to its failure is the result of an HELB outside of the Reactor Building, for which CV-1845 has no safety function.

  Radiaiton exposure due to recirculation of LOCA fluids and 40 year normal exposure is estimated to be less than 5×10^4 rads which is considered a non-harsh environment for this device. The corresponding solenoid valve SV-1845 is required only for isolation, and 30 minutes is allowed for operator verification of valve position.

  Since this device is considered to perform its safety function in a mild environment, justification for continued operation is demonstrated.

COMPONENT: Penetration Room Isolation Valves Closure Verification Switches

TAG NO(S).: ZS-2100, ZS-2101, ZS-2102, ZS-2103, ZS-2014, ZS-2105, ZS-2106

SER RESPONSE PAGE NO(S).: B154, B156, B158, B160, B162, B164, B166

FRC EQUIPMENT ITEM: 70

MANUFACTURER AND MODEL NO.: NAMCO D2400X

SYSTEM - P&ID NO.: Reactor Building Penetration Room Ventilation M-264

LOCATION: Room 79

- SAFETY FUNCTION:

  The safety function of these limit switches is to permit the reactor operator to verify closure of the associated control valves, after the initiation of a Reactor Building Isolation Emergency Safeguards Actuation System signal.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies (except for radiation) occur during an HELB outside the Reactor Building. Since these switches have no safety function during an HELB, failure during this event does not jeopardize plant safety. These switches are required following a LOCA.

  The radiation exposure to these devices is due to recirculation of LOCA fluids; however, since the switches perform their safety function within 30 minutes (operator verification of valve closure) the accumulated dose is less than 5×10^4 rads, which is considered non-harsh.

  Since the devices perform their safety function in a mild environment, justification for continued operation is demonstrated.

COMPONENT: Reactor Building Penetration Room Ventilation Valve Position Switches

TAG NO(S).: ZS-2123, ZS-2126, ZS-2133, ZS-2136

SER RESPONSE PAGE NO(S).: B178, B176, B172, B170

FRC EQUIPMENT ITEM: 67, 68, 69

MANUFACTURER AND MODEL NO.: NAMCO D2400X

SYSTEM - P&ID NO.: Reactor Building Penetration Room Ventilation M-264

LOCATION: Room 47

- SAFETY FUNCTION:

  The safety function of these position switches is to permit the reactor operator to verify the associated valve position.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  The qualification discrepancies (except for radiation) for these position switches results from a High Energy Line Break (HELB) outside the reactor building. Since the safety function of the switches requires operability within 30 days after a LOCA, which occurs inside the reactor building, the required safety operation of the switches is not jeopardized.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Penetration Room Ventilation filters. If the unit in Room 47 is conservatively assumed to filter 50% of the airborne Iodines from the containment, an exposure of 1.5×10^6 rads for these components must be considered.

  AP&L had previously determined that these items performed their safety functions in a mild environment; however, considering the recently determined additional dose, AP&L is in the process of confirming qualification of the switches to the higher dose level.

  If the switches were to fail, the appropriate valve positions, could be inferred by the flow measurements available. In addition, two trains are available. Considering the design of these switches and applicable exposures, the devices are considered capable of withstanding the dose; however, AP&L will confirm the full qualification of the devices or replace them with qualified substitutes by the next refueling outage.

Based on the above, justification for continued operation is demonstrated.

COMPONENT: Reactor Building Service Water Cooling Coils Isolation Valve Position Switch

TAG NO(S).: ZS-3814

SER RESPONSE PAGE NO(S).: B038

FRC EQUIPMENT ITEM: 66

MANUFACTURER AND MODEL NO.: NAMCO D2400X

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 46

- SAFETY FUNCTION:

  ZS-3814 indicates the position of valve CV-3814 to the operator.

- QUALIFICATION DISCREPANCY:

  According to Franklin, documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  ZS-3814 is required to provide its safety function for an initiating event occurring inside of containment. For this event, ZS-3814, which is located outside of containment, will not experience a harsh environment. ZS-3814 will be subjected to a harsh environment only following a reactor coolant letdown line break or a Main Feedwater line break for which ZS-3814 has no safety function.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 8.4E5 rads to this component must be considered.

  The Hydrogen Purge System is not required to operate during the first 11.5 days following a LOCA (Re: FSAR Section 6.6). Therefore, the Hydrogen Purge Unit filters will not provide radiation exposure to SV-3814 during this period. At the time the Hydrogen Purge System is placed in service, the Reactor Building pressure and temperature will have returned to near normal conditions (Re: FSAR Figure 14-61) via operation of the Reactor Building Coolers and Spray System.

  In addition, as noted in FSAR Section 6.3.3, the Reactor Building Spray System provides a redundant means of Reactor Building heat removal.

AP&L will demonstrate full qualification of this device or replace it with a fully qualified substitute by the next refueling outage.

Based on the above, justification for continued operation is demonstrated.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Service Water Cooling Coils Isolation Valve Position Switch

TAG NO(S).: ZS-3815

SER RESPONSE PAGE NO(S).: B040

FRC EQUIPMENT ITEM: 70

MANUFACTURER AND MODEL NO.: NAMCO D2400X

SYSTEM - P&ID NO.: Service Water System M210

LOCATION: Room 79

- SAFETY FUNCTION:

  ZS-3815 indicates the position of valve CV-3815 to the operator.

- QUALIFICATION DISCREPANCY:

  According to Franklin, the documented evidence of qualification is inadequate.

- JUSTIFICATION FOR CONTINUED OPERATION:

  ZS-3815 is required to provide its safety function for an initiating event occurring inside of the Reactor Building. For this event, ZS-3815, which, which is located outside of the Reactor Building will not experience a harsh environment. ZS-3815 will be subjected to harsh environment only following a Reactor Coolant letdown line break or a Main Feedwater line break, for which ZS-3815 has no safety function.

  This device was considered not qualified due to the recirculation dose due to a LOCA of 4.2×10^6 rads.

  However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an additional exposure of 1.8×10^6 rads to this component must be considered.

  The Hydrogen Purge System is not required to operate during the first 11.5 days following a LOCA (Re: FSAR Section 6.6). Therefore, the Hydrogen Purge Unit filters will not provide radiation exposure to ZS-3815 during this period. At the time the Hydrogen Purge System is placed in service, the Reactor Building pressure and temperature will have returned to near normal conditions. (Re: FSAR Figure 14-61) via operation of the Reactor Building Coolers and Spray System.

In addition, as noted in FSAR Section 6.3.3, the Reactor Building Spray System provides a redundant means of reactor building heat removal.

AP&L will demonstrate full qualification of this device or replace it with a fully qualified substitute by the next refueling outage.

Based on the above, justification for continued operation is demonstrated.