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November 29, 1984

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Attn: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing
Washington, DC 20555

Reference: Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
Environmental Qualification of Safety-Related Electrical Equipment

Gentlemen:

On December 27, 1982, Duquesne Light Company (DLC) received the Safety Evaluation Report (SER) regarding the Environmental Qualification of Safety-Related Electrical Equipment at Beaver Valley Power Station Unit No. 1 (BV-1). The SER contained a Technical Evaluation Report (TER), written by Franklin Research Center (FRC) under contract to the NRC, which noted a number of environmental qualification documentation deficiencies for safety-related equipment at BV-1. Responses required by the SER were submitted by DLC in February and March of 1983.

On April 5, 1984, a meeting was held with members of the NRC Staff to discuss Duquesne Light Company's proposed method of resolution of each of those deficiencies. The proposed resolution, as discussed in detail with the Staff, for each of the environmental qualification documentation deficiencies listed in the TER is summarized in Enclosure 1 to this letter. Discussions also took place at the meeting regarding Duquesne Light's general methodology for compliance with 10CFR50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," which became effective February 22, 1983. The purpose of this letter is to provide documentation of the discussions held at the April 5 meeting.

Enclosure 1 to this letter contains an updated "Equipment Qualification Items Summary" which contains a summary description of the method of environmental qualification for each equipment item as discussed with the Staff at the April 5, 1984 meeting. Enclosure 2 contains a revised "Master List of Electrical Equipment Requiring Qualification" which lists all equipment at BV-1 within the scope of 10CFR50.49. The equipment list is similar to the list of equipment submitted in response to the 10CFR50.49 rulemaking by our letter dated May 20, 1983.



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For those equipment items for which the documentation of environmental qualification is not yet completed, justifications for continued operation (JCOs) have been provided by DLC in previous submittals to the NRC. JCOs submitted prior to the issuance of the TER were reviewed and found acceptable by FRC. As a result of the SER, however, additional JCOs were submitted by DLC on February 1, 1983. Duquesne Light Company considers that its previously submitted JCOs remain valid and that continued safe plant operation is not impaired. As requested, those JCOs still being relied upon have been included as Enclosure 3.

At the April 5, 1984 meeting, the Staff requested that all design-basis events at BV-1 which could result in a potentially harsh environment, including flooding outside containment, be identified. The methodology for the evaluation of equipment and the determination of the environmental conditions was included in Sections 2 and 3 of our EQ submittal dated October 15, 1981 for IEB 79-01B. For convenience, a summary of our methodology has been included as Enclosure 4 to this letter. As our methodology indicates, all design-basis events at BV-1 which could result in a potentially harsh environment, including flooding outside containment, were considered in the identification of electrical equipment within the scope of Paragraph (b) (1) of 10CFR50.49 (i.e., "Safety-related electric equipment . . . relied upon to remain functional during and following design basis events . . .").

The method of identification of electrical equipment within the scope of Paragraph (b) (2) of 10CFR50.49 (i.e., "Nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions . . .") is also described in Enclosure 4. No additional electrical equipment at BV-1 was identified during this review, which was not previously included in the "Master List of Equipment Requiring Qualification."

The method used to identify electrical equipment within the scope of Paragraph (b) (3) of 10CFR50.49 (i.e., "Certain post-accident monitoring equipment") involves a variable-by-variable comparison of the specific guidelines of Regulatory Guide 1.97, "Instrumentation to Access Plant and Environmental Conditions During and Following an Accident," to the design of BV-1. An evaluation of this comparison is being conducted to determine environmental qualfication needs for the subject instrumentation and sampling equipment at BV-1. The results of this Regulatory Guide 1.97 evaluation will be submitted by November 30, 1985 in accordance with our Confirmatory Order dated June 12, 1984 based on our 10CFR50.54(f) response to Generic Letter 82-33. Post-accident monitoring equipment which was installed in the plant during recent outages to satisfy Regulatory Guide 1.97 and NUREG-0737 criteria has been reviewed, as described in Enclosure 4, to identify environmental qualification needs. These items have been included in the "Master List of Equipment Requiring Qualification."

In summary, we believe that the enclosed "Master List of Equipment Requiring Qualification" complies with the scope requirements of Paragraph (b) of 10CFR50.49 as described above.

Additional questions at the April 5, 1984 meeting concerned the DLC resolution of the chemical spray deficiencies identified in the TER and the DLC program regarding ongoing EQ maintenance. These issues were discussed in the meeting, and further details are provided in Enclosures 5 and 6, respectively.

Other supporting EQ information and documentation are maintained in the BV-1 EQ File. We believe the environmental qualification documentation maintained in the BV-1 EQ File complies with the requirements of 10CFR50.49. This file is available for audit at any time.

As a result of our meeting, we understand that a supplemental SER will be issued to indicate that Duquesne Light Company's Equipment Qualification Program, as described in this letter, meets the requirements of 10CFR50.49 and that the deficiencies noted in the SER dated December 16, 1983 have been addressed.

Very truly yours,

J. J. Carey
Vice President, Nuclear

Enclosures

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## ENCLOSURES

1. Equipment Qualification Items Summary
2. Master List of Electrical Equipment Requiring Qualification
3. Justifications for Continued Operation
4. Methodology for Master List Development and Environmental Service Conditions
5. Chemical Spray Analysis
6. EQ Maintenance

ENCLOSURE 1

# EQUIPMENT QUALIFICATION ITEMS SUMMARY

## BEAVER VALLEY POWER STATION UNIT NO. 1

# BEAVER VALLEY POWER STATION

## UNIT NO. 1

## EQUIPMENT QUALIFICATION ITEMS SUMMARY

Duquesne Light Company

Nuclear Engineering Department

DESCRIPTION OF NRC QUALIFICATION EVALUATION CATEGORIES

| | |
|---|---|
| Ia | Qualified |
| Ib | Modification |
| IIa | Qualification Not Established |
| IIb | Not Qualified |
| IIc | Qualified Life Deficiency |
| IIIa | Exempt |
| IIIb | Not In Scope |
| IV | Documentation Not Available |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 1 | 70 (Ia) | Power Cable | Kerite | None | None | °Qualified by test | Qualified |
| 2 | 69 (IIa) | Power Cable | Cerro wire and cable company (Rockbestos) | °Inadequate qualification documentation °Similarity | None | °Letter from manufacturer has established the material similarity to what was successfully tested. °IE Notice 84-44 indicated that back-up documentation for Rockbestos test reports was unavailable. | Conditionally Qualified (Pending results of future vendor testing program) |
| 3 | 68 (Ia) | Power Cable | Okonite | None | None | °Qualified by test | Qualified |
| 4 | 71 (Ia) | Control Cable | Okonite | None | None | °Qualified by test | Qualified |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 5 | 72 (Ib) | Instrument Cable | Continental Wire Company | °Radiation levels<br>°Chemical spray<br>°Aging evaluation | None | °Satisfactorily tested for D.L.C. @ Wyle | Qualified |
| 6 | 75 (IIa) | Penetration | Viking | °Radiation levels<br>°Aging evaluation | None | °Satisfactorily tested for D.L.C. @ Wyle | Qualified |
| 7 | 79 (Ib) | Terminal Block | Buchanon | °Radiation levels<br>°Traceability<br>Aging Evaluation | None | °Satisfactorily tested for D.L.C. @ Wyle (for use in control & power circuits) | Qualified |
| 8 | 80 (IIa) | Terminal Block | Penn Union | °Similarity<br>°Steam exposure | None | °A review of actual installed terminal blocks and lugs compared to what was tested has resulted in the conclusion that the test was conducted on the exact type of terminal block and ring compression lug used in the plant. DLC had conducted its own qualification testing on the terminal blocks which was not addressed in the TER.<br>°This DLC test did in fact subject the terminal blocks to a more severe steam environment than that required by the plant conditions. | Qualified |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 9 | 76<br>(1a) | Control Cable | Rockbestos Firewall SIS | None | None | °Letter from manufacturer has established the material similarity to what was successfully tested.<br>°IE Notice 84-44 indicated that back-up documentation for Rockbestos test reports was unavailable. | Conditionally Qualified (Pending results of future vendor testing program) |
| 10 | 29<br>30<br>31<br>32<br>33<br>34<br>35<br>(1b) | Solenoid Valve | ASCO | °Chemical spray | Requires conduit seals | °Install conduit seals to prevent migration of chemical spray into the solenoid internals during the 4th Refueling Outage. | Conditionally Qualified |
| 11 | 59<br>(1b) | Limit Switch | NAMCO | °Inadequate steam exposure | °Requires conduit seals | °Install qualified replacement limit switches with silicone gaskets and conduit seals during the 4th Refueling Outage to prevent steam migration and eliminate the steam exposure deficiency. | Conditionally Qualified |
| 12 | - | Unassigned Number | - | - | - | - | - |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 13 | 57 (Ib) | Limit Switch | NAMCO | °Inadequate steam exposure | °Requires conduit seals | °Install qualified replacement limit switches with silicone gaskets and condiut seals by the end of the 4th Refueling Outage to prevent steam migration and eliminate the steam exposure deficiency. | Conditionally Qualified |
| 14 | 38 (Ib) | Flow Transmitter | Fischer Porter | °Aging<br>°Radiation level<br>°Steam exposure<br>°Testing anomaly<br>°Test duration margin | °Inadequate qualification levels | °Replace with qualified Barton Lot 5 Transmitter by the end of the 4th Refueling Outage | Pending Modification |
| 15 | 36 (IIa) | Flow Transmitter | Barton 386 | °Similarity<br>°Aging<br>°Test duration<br>°Chemical spray<br>°Submergence<br>°Accuracy | °Inadequate qualification levels | °Replace with qualified Barton Lot 5 Transmitters by the end of the 4th Refueling Outage | Pending Modification |
| 16 | 48 (Ib) | Level Transmitter | Barton 386 | °Aging<br>°Accuracy<br>°Similarity<br>°Test duration<br>°Spray | °Soldering | °Barton 386 has been replaced with a qualified Barton 764 Lot 2 that will be further enhanced by soldering the connector | Pending Modification |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| | 49<br>(IIa) | Level<br>Transmitter | Barton 764<br>Lot 2 | °Aging<br>°Test anomaly | °Soldering | °Solder the connector in the qualified transmitter for increased reliability. | Pending Modification |
| 17 | 41<br>(Ib) | Level<br>Transmitter | GEMS | °Similarity<br>°Aging<br>°Temperature<br>°Pressure<br>°Chemical spray<br>°Submergence | °Original and replacement equipment have inadequate qualification levels | °Will be replaced with qualified unit during the 4th Refueling Outage | Pending Modification |
| 18 | 83<br>(Ib) | Level<br>Transmitter | Mason-Neilan | °Inadequate qualification documentation | °None | °Review indicates item outside scope of 50.49 | Exempt<br>Outside the scope of 50.49 |
| 19 | 47<br>91<br>(Ib) | Pressure<br>Transmitter | Fischer<br>Porter | °Inadequate qualification documentation | °Inadequate qualification level | °Will be replaced with qualified Barton Lot 5 transmitter during the 4th Refueling Outage | Pending Modification |
| 20 | 46<br>(IIa) | Pressure<br>Transmitter | Barton 763<br>Lot 2 | °Aging<br>°Test anomaly | °Aging analysis<br>°Soldering procedure | °Solder pin connector in the qualified transmitter for increased reliability | Pending Modification |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 21 | 40<br>(Ib) | Level<br>Transmitter | Barton<br>386 | °Similarity<br>°Aging<br>°Qualified life<br>°Test duration<br>°Chemical spray | °Inadequate qualification level | °Will be replaced with qualified Barton Lot 5 transmitter during the 4th Refueling Outage | Pending Modification |
| 22 | 52<br>(IIa) | Narrow range<br>RTD | Sostman | °Aging<br>°Chemical spray<br>°Similarity<br>°Accuracy | °Thermal aging analysis<br>°Chemical spray<br>°Accuracy analysis | °Chemical, aging, and accuracy analyses have been completed which are supplemental to previous RTD testing | Qualified |
| | 53<br>(Ib) | Wide range<br>RTD | Sostman | °Inadequate documentation<br>°Aging<br>°Chemical spray | °Thermal aging analysis<br>°Chemical spray<br>°Accuracy analysis | °Based on previous testing by Westinghouse and supplemental analysis, issues related to radiation and thermal aging as well as chemical spray have been addressed | Qualified |
| 23 | 55<br>(Ib) | Electric<br>Thermometer | Trinity | °Inadequate qualification documentation | °Conduit seal | °Trinity units have been replaced with qualified Conax RTD's.<br>°Will install qualified conduit seal during 4th Refueling Outage on the replacement Conax RTD's | Conditionally Qualified |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 24 | 1<br>(IIa) | MOV | Limitorque | °Aging<br>°Inadequate qualification documentation<br>°Similarity | °Not reviewed because equipment considered exempt | °Valves are locked closed. | Exempt<br>Outside the scope of 50.49 |
| 25 | 3<br>4<br>5<br>(IIa) | MOV | Limitorque | °Inadequate qualification documentation<br>°Similarity<br>°Aging | None | °Valve manufacturer has documented traceability. | Qualified |
| | 2<br>(IIa) | MOV | Limitorque | °Inadequate qualification documentation<br>°Similarity<br>°Aging | °Similarity<br>°Aging analysis<br>°Radiation | °MOV-CH-310 will be replaced with a qualified operator during the 4th Refueling Outage. | Pending Modification |
| | 90<br>(Ib) | MOV | Limitorque | °Inadequate qualification documentation<br>°Similarity<br>°Aging | °Similarity<br>°Aging analysis<br>°Radiation | °MOV-SI-842 will be replaced with qualified operator during the 4th Refueling Outage. | Pending Modification |
| 26 | 56<br>(IIa) | Pump Motor | G.E. | °Similarity<br>°Aging<br>°Temperature exposure for inadequate durations | °Aging | °An aging & thermal analysis has been performed. Motor lead splices will be replaced with qualified splices during the 4th Refueling Outage<br>°COC obtained from G.E. establishes similarity between plant motor and what was tested. | Pending Modification |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 27 | 50<br>51<br><br>(Ib) | Accelerometer Amplifier | ENDEVCO Unholtz-Dickie | °Inadequate evidence of documentation of the system | °Amplifier requires conduit seal<br>°Amplifier has inadequate qualification level. | °Will install qualified TEC amplifier in a transient shield housing during the 4th Refueling Outage. | Pending Modification |
| 28 | 6<br>7<br>8<br>9<br>45<br>54<br>60<br>(IIa) | RHR System Equipment | Various | °Inadequate qualification documentation | None | °Cold shutdown equipment is not considered to be within the scope of the Rulemaking | Exempt Outside the scope of 50.49 |
| 29 | 81<br>(Ib) | Terminal Block | Marathon 1500 Series | °Steam exposure<br>°Test Anomaly | None | °A walkdown was performed to establish similarity between the units installed and the units that were successfully tested. | Qualified |
| 30 | 78<br>(Ia) | Cable Splice | Okonite | None | None | Qualified by test | Qualified |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 31 | 77 (Ib) | Cable Splice | Kerite | °Temperature<br>°Radiation | None | °Replaced during 2nd Refueling Outage with qualified Kerite splice | Qualified |
| 32 | 74 (Ib) | Control cable | G.E.Vulkene | °Inadequate qualification documents | None | °Any Vulkene cable found in the MCC or in air operated valve circuit was replaced during previous RFO's with qualified Vulkene/Supreme control cable. | Qualified |
| 33 | 73 (IIa) | Control cable | G.E. Vulkene Supreme 57279 | °Similarity | None | °Similarity was established by collecting plant specific references and the matching manufacturer's product data sheet WCD-380.<br>°The cable was qualified by test | Qualified |
| 34 | - | (Not Assigned) | - | - | - | - | - |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 35 | 65<br>66<br>67<br>(IIa) | Motor Control Center | Allis Chalmers | °Inadequate qualification documentation<br>°Similarity<br>°Aging<br>°Radiation | None | °Replaced the motor control center's transformer with a qualified unit that was the same as the transformer tested to achieve complete similarity.<br>°Radiation analysis performed | Qualified |
| 36 | 26<br>27<br>28<br>(Ib) | Solenoid valves | ASCO | °Inadequate qualification documentation | None | °Replaced with qualified solenoid valves during 2nd Refueling Outage | Qualified |
| 37 | 24<br>25<br>(Ib) | Solenoid valve | ASCO | °Inadequate qualification documentation | None | °Replaced with qualified solenoid valves during 2nd Refueling Outage | Qualified |
| 38 | 58<br>(Ib) | Limit switches | NAMCO | °Indadequate qualification documentation | None | °Replaced with qualified limit switches during 2nd Refueling Outage | Qualified |

| 79-01B | FRC E1# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 39 | 84 (Ib) | Limit switches | NAMCO | °Inadequate steam exposure | None | °Plant modifications changed service conditions such that limit switches will not be exposed to steam during the accident for which they are required to operate. | Qualified |
| 40 | 39 43 (Ib) | Flow transmitter | Fischer Porter | °Inadequate qualification documentation | Inadequate qualification levels | °Will replace with qualified Barton Lot 5 transmitter during 4th Refueling Outage | Pending Modification |
| 41 | 37 42 (Ib) | Pressure transmitter | Fischer Porter | °Inadequate qualification documentation | Inadequate qualification levels | °Will replace with qualified Barton Lot 5 transmitter during 4th Refueling Outage | Pending Modification |
| 42 | 44 (Ib) | Pressure transmitter | Fischer Porter | °Inadequate qualification documentation | Inadequate qualification levels | °Will replace with qualified Barton Lot 5 transmitters during 4th Refueling Outage | Pending Modification |

| 79-01B | FRC EI#. | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 43 | 16<br>82<br>(IIIa)<br>20<br>(IIc)<br>17<br>18<br>19<br>21<br>85<br>87<br>(IIIb)<br>86<br>(IIa) | MOV | Limitorque | None | None | °Equipment exempt because equipment is not exposed to harsh environment for the accident condition for which it must function. | Exempt Outside the Scope of 50.49 |
| 44 | 22<br>23<br>88<br>(IIc) | MOV | Limitorque | °Inadequate qualification documentation | None | °Manufacturer has established similarity between valve operators in the plant and the test specimen.<br>°If non-nuclear parts or motor brake assemblies are found, part replacement will be scheduled as part of the plant's routine preventive maintenance program. | Qualified |

| 79-01B | FRC EI# | Description | Manufacturer | TER Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 45 | 10<br>12<br>15<br>(IIa)<br>11<br>13<br>14<br>89<br>(IIc) | MOV | Limitorque | °Inadequate qualifiction documentation<br>°Aging<br>°Similarity | None | °Manufacturer has established similiarity between valve operators in plant and test specimen.<br>°If non-nuclear grade parts or motor brake assemblies are found, their replacement will be scneduled as part of the plant's routine preventive maintenance | Qualified |
| 46 | 61<br>(Ib) | Motor | Louis Allis | °Inadequate qualification documentation | None | °Replaced outside recirculation spray pump motors with qualified Siemens Allis motor during 2nd Refueling Outage. | Qualified |
| | 62<br>(IIa) | Motor | Louis Allis | °Inadequate qualification documentation | None | °Supplemental analysis demonstrates qualification for the auxiliary feedwater pump motors. | Qualified |

| 79-01B | FRC Li# | Description | Manufacturer | IEB Deficiency | Outstanding Items | Resolution Status | Qualification Status |
|---|---|---|---|---|---|---|---|
| 47 | 63 (IIa) | Motor | Westinghouse | °Aging<br>°Duration of test | °Aging analysis for bearings, lubricants, motor winding, insulation and splices | °Motor splices were replaced during 2nd Refueling Outage<br>°Similarity analysis between what was tested to what is installed in the plant is currently being done<br>Aging analysis is underway. | Documentation Incomplete |
| 48 | 64 (IIa) | Motor | Westinghouse | °Aging<br>°Duration of test | °Aging analysis for bearings, lubricants, motor winding, insulation, and splices. | °Motor splices were replaced during 2nd Refueling Outage.<br>°Similarity analysis between what was tested to what is installed in the plant is currently being conducted.<br>°Aging analysis is underway. | Documentation Incomplete |

ENCLOSURE 2

# MASTER LIST OF ELECTRICAL EQUIPMENT

# REQUIRING QUALIFICATION

# BEAVER VALLEY POWER STATION UNIT NO. 1

DUQUESNE LIGHT COMPANY
HARSH AREA REPORT

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| EQ ITEM | DESCRIPTION | MANUFACTURER | MARK NUMBER |
|---|---|---|---|
| 1 | POWER CABLE | KERITE | NFB-16 |
| 2 | POWER CABLE | CERRO WIRE | NFB-65 |
| 3 | POWER CABLE | OKONITE | X-N/A |
| 4 | CNTRL CABLE | OKONITE | X-N/A |
| 5 | INSTRUMENT CBL | CONTINENTAL W&C | X-N/A |
| 6 | PENE. TYPE II | VIKING | X-N/A |
| 6 | PENE. TYPE I | VIKING | X-N/A |
| 6 | PENE. TYPE V | VIKING | X-N/A |
| 6 | PENE. TYPE VIII | VIKING | X-N/A |
| 6 | PENE. TYPE III | VIKING | X-N/A |
| 6 | PENE. TYPE IX | VIKING | X-N/A |
| 6 | PENE. TYPE IV | VIKING | X-N/A |
| 7 | TERMINAL BLK | BUCHANAN | X-N/A |
| 8 | TERMINAL BLK | PENN UNION | X-N/A |
| 9 | SIS WIRE | ROCKBESTOS | X-N/A |
| 10 | SOLENOID | ASCO | SOV-CC-103A1 |
| 10 | SOLENOID | ASCO | SOV-CC-103B1 |
| 10 | SOLENOID | ASCO | SOV-CC-103C1 |
| 10 | SOLENOID | ASCO | SOV-CC-105D1 |
| 10 | SOLENOID | ASCO | SOV-CC-105E1 |
| 10 | SOLENOID | ASCO | SOV-CC-107D1 |
| 10 | SOLENOID | ASCO | SOV-CC-107E1 |
| 10 | SOLENOID | ASCO | SOV-CC-110D |
| 10 | SOLENOID | ASCO | SOV-CC-110E3 |
| 10 | SOLENOID | ASCO | SOV-CC-111A2 |
| 10 | SOLENOID | ASCO | SOV-CC-111D1 |
| 10 | SOLENOID | ASCO | SOV-CH-200A1 |
| 10 | SOLENOID | ASCO | SOV-CH-200B1 |
| 10 | SOLENOID | ASCO | SOV-CH-200C1 |
| 10 | SOLENOID | ASCO | SOV-CV-102-1 |
| 10 | SOLENOID | ASCO | SOV-DA-100A |
| 10 | SOLENOID | ASCO | SOV-DG-108A |
| 10 | SOLENOID | ASCO | SOV-DG-109A2 |
| 10 | SOLENOID | ASCO | SOV-LM-101A |
| 10 | SOLENOID | ASCO | SOV-LM-101B |
| 10 | SOLENOID | ASCO | SOV-RC-455C1 |
| 10 | SOLENOID | ASCO | SOV-RC-455C2 |
| 10 | SOLENOID | ASCO | SOV-RC-455D1 |
| 10 | SOLENOID | ASCO | SOV-RC-455D2 |
| 10 | SOLENOID | ASCO | SOV-RC-456-1 |
| 10 | SOLENOID | ASCO | SOV-RC-456-2 |
| 10 | SOLENOID | ASCO | SOV-SI-101-2 |
| 10 | SOLENOID | ASCO | SOV-SS-000A |
| 11 | LIMIT SWITCH | NAMCO | LMS-CC-105D1 |
| 11 | LIMIT SWITCH | NAMCO | LMS-CC-111D1 |
| 11 | LIMIT SWITCH | NAMCO | LMS-CH-200A |
| 11 | LIMIT SWITCH | NAMCO | LMS-CH-200B |
| 11 | LIMIT SWITCH | NAMCO | LMS-CH-200C |
| 11 | LIMIT SWITCH | NAMCO | LMS-RC-455C |
| 11 | LIMIT SWITCH | NAMCO | LMS-RC-455D |
| 11 | LIMIT SWITCH | NAMCO | LMS-RC-456 |
| 11 | LIMIT SWITCH | NAMCO | LMS-SI-101-2 |

DUQUESNE LIGHT COMPANY
HARSH AREA REPORT

DATE: 11/30/84 

| EQ ITEM | DESCRIPTION | MANUFACTURER | MARK NUMBER |
|---|---|---|---|
| 11 | LIMIT SWITCH | NAMCO | LMS-SI-865A |
| 11 | LIMIT SWITCH | NAMCO | LMS-SI-865B |
| 11 | LIMIT SWITCH | NAMCO | LMS-SI-865C |
| 13 | LIMIT SWITCH | NAMCO | LMS-CC-105E1 |
| 13 | LIMIT SWITCH | NAMCO | LMS-CC-107D1 |
| 13 | LIMIT SWITCH | NAMCO | LMS-CC-107E1 |
| 13 | LIMIT SWITCH | NAMCO | LMS-CC-110E3 |
| 13 | LIMIT SWITCH | NAMCO | LMS-CV-102-1 |
| 13 | LIMIT SWITCH | NAMCO | LMS-DG-109A2 |
| 14 | FLOW TRANS | FISCHER PORTER | FT-MS-474 |
| 14 | FLOW TRANS | FISCHER PORTER | FT-MS-475 |
| 14 | FLOW TRANS | FISCHER PORTER | FT-MS-484 |
| 14 | FLOW TRANS | FISCHER PORTER | FT-MS-485 |
| 14 | FLOW TRANS | FISCHER PORTER | FT-MS-494 |
| 14 | FLOW TRANS | FISCHER PORTER | FT-MS-495 |
| 15 | FLOW TRANS | ITT BARTON | FT-SI-961 |
| 15 | FLOW TRANS | ITT BARTON | FT-SI-962 |
| 15 | FLOW TRANS | ITT BARTON | FT-SI-963 |
| 16A | LEVEL TRANS | ITT BARTON | LT-FW-474 |
| 16A | LEVEL TRANS | ITT BARTON | LT-FW-475 |
| 16A | LEVEL TRANS | ITT BARTON | LT-FW-476 |
| 16A | LEVEL TRANS | ITT BARTON | LT-FW-484 |
| 16A | LEVEL TRANS | ITT BARTON | LT-FW-485 |
| 16A | LEVEL TRANS | ITT BARTON | LT-FW-486 |
| 16A | LEVEL TRANS | ITT BARTON | LT-FW-494 |
| 16A | LEVEL TRANS | ITT BARTON | LT-FW-495 |
| 16A | LEVEL TRANS | ITT BARTON | LT-FW-496 |
| 16A | LEVEL TRANS | ITT BARTON | LT-RC-459 |
| 16A | LEVEL TRANS | ITT BARTON | LT-RC-460 |
| 16A | LEVEL TRANS | ITT BARTON | LT-RC-461 |
| 19 | PRESS TRANS | FISCHER PORTER | PT-RC-472 |
| 19 | PRESS TRANS | FISCHER PORTER | PT-RS-152A |
| 19 | PRESS TRANS | FISCHER PORTER | PT-RS-152B |
| 20 | PRESSURE TRANS | ITT BARTON | PT-RC-402 |
| 20 | PRESSURE TRANS | ITT BARTON | PT-RC-403 |
| 20 | PRESSURE TRANS | ITT BARTON | PT-RC-455 |
| 20 | PRESSURE TRANS | ITT BARTON | PT-RC-456 |
| 20 | PRESSURE TRANS | ITT BARTON | PT-RC-457 |
| 21 | LEVEL TRANS | ITT BARTON | LT-FW-477 |
| 21 | LEVEL TRANS | ITT BARTON | LT-FW-487 |
| 21 | LEVEL TRANS | ITT BARTON | LT-FW-497 |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-410 |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-412B |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-412D |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-420 |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-422B |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-422D |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-423 |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-430 |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-432B |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-432D |
| 22 | TEMP RES BULB | SOSTMAN | TRB-RC-433 |

REPORT SORTED ON EQUIPMENT ITEM

DUQUESNE LIGHT COMPANY
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| EQ ITEM | DESCRIPTION | MANUFACTURER | MARK NUMBER |
|---|---|---|---|
| 24 | DAMPER MOTOR | LIMITORQUE | VS-D-5-3B |
| 24 | DAMPER MOTOR | LIMITORQUE | VS-D-5-5B |
| 25A | MOTOR OP VALVE | LIMITORQUE | MOV-CH-310 |
| 25A | MOTOR OP VALVE | LIMITORQUE | MOV-CH-378 |
| 25A | MOTOR OP VALVE | LIMITORQUE | MOV-RC-535 |
| 25A | MOTOR OP VALVE | LIMITORQUE | MOV-RC-536 |
| 25A | MOTOR OP VALVE | LIMITORQUE | MOV-RC-537 |
| 25A | MOTOR OP VALVE | LIMITORQUE | MOV-SI-842 |
| 25A | MOTOR OP VALVE | LIMITORQUE | MOV-SI-865A |
| 25A | MOTOR OP VALVE | LIMITORQUE | MOV-SI-865B |
| 25A | MOTOR OP VALVE | LIMITORQUE | MOV-SI-865C |
| 26 | PUMP MOTOR | GENERAL ELEC | RS-P-1A |
| 26 | PUMP MOTOR | GENERAL ELEC | RS-P-1B |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-100A1 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-100A2 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-100B1 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-100B2 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-100C1 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-100C2 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-101A1 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-101A2 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-101B1 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-101B2 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-101C1 |
| 27A | ACCELEROMETER | ENDEVCO | FE-RC-101C2 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-100A-1 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-100A-2 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-100B-1 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-100B-2 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-100C-1 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-100C-2 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-101A-1 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-101A-2 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-101B-1 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-101B-2 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-101C-1 |
| 27B | CRG AMPLIFIER | UNHOLTZ-DICKIE | FY-RC-101C-2 |
| 28 | MOTOR OP VALVE | CONTROL PRODUCT | MOV-CC-112A2 |
| 28 | MOTOR OP VALVE | CONTROL PRODUCT | MOV-CC-112A3 |
| 28 | MOTOR OP VALVE | CONTROL PRODUCT | MOV-CC-112B2 |
| 28 | MOTOR OP VALVE | CONTROL PRODUCT | MOV-CC-112B3 |
| 28 | MOTOR OP VALVE | CONTROL PRODUCT | MOV-RH-605 |
| 28 | MOTOR OP VALVE | CONTROL PRODUCT | MOV-RH-700 |
| 28 | MOTOR OP VALVE | CONTROL PRODUCT | MOV-RH-701 |
| 28 | MOTOR OP VALVE | CONTROL PRODUCT | MOV-RH-720A |
| 28 | MOTOR OP VALVE | CONTROL PRODUCT | MOV-RH-720B |
| 28 | MOTOR OP VALVE | CONTROL PRODUCT | MOV-RH-758 |
| 28 | THERMOCOUPLE | CONTROL PRODUCT | RH-P-1A |
| 28 | THERMOCOUPLE | CONTROL PRODUCT | RH-P-1B |
| 28 | THERMOCOUPLE | CONTROL PRODUCT | TC-2 |
| 28 | THERMOCOUPLE | CONTROL PRODUCT | TC-20 |
| 28 | THERMOCOUPLE | CONTROL PRODUCT | TC-22 |

DUQUESNE LIGHT COMPANY
HARSH AREA REPORT

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| EQ ITEM | DESCRIPTION | MANUFACTURER | MARK NUMBER |
|---|---|---|---|
| 28 | THERMOCOUPLE | CONTROL PRODUCT | TC-23 |
| 28 | THERMOCOUPLE | CONTROL PRODUCT | TC-24 |
| 28 | THERMOCOUPLE | CONTROL PRODUCT | TC-3 |
| 28 | THERMOCOUPLE | CONTROL PRODUCT | TC-5 |
| 28 | THERMOCOUPLE | CONTROL PRODUCT | TC-6 |
| 29 | TERMINAL BLK | MARATHON | NONE |
| 30 | CABLE SPLICE | OKONITE | X-N/A |
| 32 | SIS WIRE | GENERAL ELEC | X-N/A |
| 33 | SIS WIRE | GENERAL ELEC | X-N/A |
| 35 | MTR CNTRL CNTR | ALLIS CHALMERS | MCC-1-E12 |
| 35 | MTR CNTRL CNTR | ALLIS CHALMERS | MCC-1-E3 |
| 35 | MTR CNTRL CNTR | ALLIS CHALMERS | MCC-1-E4 |
| 35 | MTR CNTRL CNTR | ALLIS CHALMERS | MCC-1-E5 |
| 35 | MTR CNTRL CNTR | ALLIS CHALMERS | MCC-1-E6 |
| 39 | LIMIT SWITCH | NAMCO | LMS-FW-103A |
| 39 | LIMIT SWITCH | NAMCO | LMS-FW-103B |
| 40 | FLOW TRANS | FISCHER PORTER | FT-FW-100A |
| 40 | FLOW TRANS | FISCHER PORTER | FT-FW-100B |
| 40 | FLOW TRANS | FISCHER PORTER | FT-FW-100C |
| 40 | FLOW TRANS | FISCHER PORTER | FT-RW-102A |
| 40 | FLOW TRANS | FISCHER PORTER | FT-RW-102B |
| 41 | PRESS TRANS | FISCHER PORTER | PT-LM-100A |
| 41 | PRESS TRANS | FISCHER PORTER | PT-LM-100B |
| 41 | PRESS TRANS | FISCHER PORTER | PT-LM-100C |
| 41 | PRESS TRANS | FISCHER PORTER | PT-LM-100D |
| 41 | PRESS TRANS | FISCHER PORTER | PT-RS-156A |
| 41 | PRESS TRANS | FISCHER PORTER | PT-RS-156B |
| 42 | PRESS TRANS | FISCHER PORTER | PT-MS-474 |
| 42 | PRESS TRANS | FISCHER PORTER | PT-MS-475 |
| 42 | PRESS TRANS | FISCHER PORTER | PT-MS-476 |
| 42 | PRESS TRANS | FISCHER PORTER | PT-MS-484 |
| 42 | PRESS TRANS | FISCHER PORTER | PT-MS-485 |
| 42 | PRESS TRANS | FISCHER PORTER | PT-MS-486 |
| 42 | PRESS TRANS | FISCHER PORTER | PT-MS-494 |
| 42 | PRESS TRANS | FISCHER PORTER | PT-MS-495 |
| 42 | PRESS TRANS | FISCHER PORTER | PT-MS-496 |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-863A |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-863B |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-864A |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-864B |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-885A |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-885B |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-885C |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-885D |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-890A |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-890B |
| 44 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-890C |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-115B |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-115C |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-115D |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-115E |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-275A |

REPORT SORTED ON EQUIPMENT ITEM

| EQ ITEM | DESCRIPTION | MANUFACTURER | MARK NUMBER |
|---|---|---|---|
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-275B |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-275C |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-289 |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-370 |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-373 |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-CH-381 |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-836 |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-860A |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-860B |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-862A |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-862B |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-867A |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-867B |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-867C |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-867D |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-869A |
| 45 | MOTOR OP VALVE | LIMITORQUE | MOV-SI-869B |
| 46 | PUMP MOTOR | LOUIS ALLIS | FW-P-3A |
| 46 | PUMP MOTOR | LOUIS ALLIS | FW-P-3B |
| 47 | PUMP MOTOR | WESTINGHOUSE | SI-P-1A |
| 47 | PUMP MOTOR | WESTINGHOUSE | SI-P-1B |
| 48 | PUMP MOTOR | WESTINGHOUSE | CH-P-1A |
| 48 | PUMP MOTOR | WESTINGHOUSE | CH-P-1B |
| 48 | PUMP MOTOR | WESTINGHOUSE | CH-P-1C |

# ADDITIONAL SAFETY-RELATED

# ELECTRICAL EQUIPMENT

# INCORPORATED IN BV-1

# SINCE THE SECOND REFUELING OUTAGE

Qualification Status Key:

| | | |
|---|---|---|
| Q | - | Qualified |
| CQ | - | Conditionally Qualified |
| DI | - | Documentation Incomplete |
| SC | - | Significant Concern |

DUQUESNE LIGHT COMPANY
EQ STATUS

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| EQ ITEM | DESCRIPTION | MANUFACTURER | MARK NUMBER | STATUS |
|---|---|---|---|---|
| 2008 | SOLENOID VALVE | ASCO | SOV-BD-100A | Q |
| 2008 | SOLENOID VALVE | ASCO | SOV-BD-100B | Q |
| 2008 | SOLENOID VALVE | ASCO | SOV-BD-100C | Q |
| 2008 | SOLENOID VALVE | ASCO | SOV-FP-105 | Q |
| 2008 | SOLENOID VALVE | ASCO | SOV-FW-102 | Q |
| 2008 | SOLENOID VALVE | ASCO | SOV-FW-103A | Q |
| 2008 | SOLENOID VALVE | ASCO | SOV-FW-103B | Q |
| 2009 | MOTOR | SEIMENS ALLIS | RS-P-2A | Q |
| 2009 | MOTOR | SEIMENS ALLIS | RS-P-2B | Q |
| 2010 | SOLENOID VALVE | VALCOR | SOV-FW-478A | Q |
| 2010 | SOLENOID VALVE | VALCOR | SOV-FW-478B | Q |
| 2010 | SOLENOID VALVE | VALCOR | SOV-FW-488A | Q |
| 2010 | SOLENOID VALVE | VALCOR | SOV-FW-488B | Q |
| 2010 | SOLENOID VALVE | VALCOR | SOV-FW-498A | Q |
| 2010 | SOLENOID VALVE | VALCOR | SOV-FW-498B | Q |
| 2015 | RAD MONITOR | VICTOREEN | RM-RM-219A | Q |
| 2015 | RAD MONITOR | VICTOREEN | RM-RM-219B | Q |
| 2018 | SOLENOID | VALCOR | TV-CV-150A | Q |
| 2018 | SOLENOID | VALCOR | TV-CV-150B | Q |
| 2018 | SOLENOID | VALCOR | TV-SS-102A1 | Q |
| 2018 | SOLENOID | VALCOR | TV-SS-102A2 | Q |
| 2018 | SOLENOID | VALCOR | TV-SS-105A1 | Q |
| 2018 | SOLENOID | VALCOR | TV-SS-105A2 | Q |
| 2018 | SOLENOID | VALCOR | TV-SS-106D | Q |
| 2019 | FLOW TRANS | ROSEMOUNT | FT-MS-102A | Q |
| 2019 | FLOW TRANS | ROSEMOUNT | FT-MS-102B | Q |
| 2019 | FLOW TRANS | ROSEMOUNT | FT-MS-102C | Q |
| 2020 | LIMIT SWITCH | NAMCO | LMS-CC-103A1 | Q |
| 2020 | LIMIT SWITCH | NAMCO | LMS-CC-103B1 | Q |
| 2020 | LIMIT SWITCH | NAMCO | LMS-CC-103C1 | Q |
| 2020 | LIMIT SWITCH | NAMCO | LMS-CC-110D | Q |
| 2020 | LIMIT SWITCH | NAMCO | LMS-CC-111A2 | Q |
| 2020 | LIMIT SWITCH | NAMCO | LMS-DA-100A | Q |
| 2020 | LIMIT SWITCH | NAMCO | LMS-DG-108A | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-BD-100A | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-BD-100B | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-BD-100C | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-BD-101A1 | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-BD-101A2 | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-BD-101B1 | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-BD-101B2 | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-BD-101C1 | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-BD-101C2 | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-FP-105 | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-FP-106 | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-FP-107 | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-MS-105A | Q |
| 2021 | LIMIT SWITCH | NAMCO | LMS-MS-105B | Q |
| 2022 | SOLENOID VALVE | ASCO | SOV-FP-106 | Q |
| 2022 | SOLENOID VALVE | ASCO | SOV-FP-107 | Q |

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CQ = CONDITIONALLY QUALIFIED
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DUQUESNE LIGHT COMPANY
EQ STATUS

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| EQ ITEM | DESCRIPTION | MANUFACTURER | MARK NUMBER | STATUS |
|---|---|---|---|---|
| 2022 | SOLENOID VALVE | ASCO | SOV-MS-105A | Q |
| 2022 | SOLENOID VALVE | ASCO | SOV-MS-105B | Q |
| 2024 | REST. TEMP DET. | CONAX | TRB-RS-150A | PM |
| 2024 | REST. TEMP DET. | CONAX | TRB-RS-150B | PM |
| 2025 | CABLE SPLICE | KERITE COMPANY | X-N/A | Q |
| 2027 | SOLENOID | TARGET ROCK | SOV-RC-102A | Q |
| 2027 | SOLENOID | TARGET ROCK | SOV-RC-102B | Q |
| 2027 | SOLENOID | TARGET ROCK | SOV-RC-103A | Q |
| 2027 | SOLENOID | TARGET ROCK | SOV-RC-103B | Q |
| 2027 | SOLENOID | TARGET ROCK | SOV-RC-104 | Q |
| 2027 | SOLENOID | TARGET ROCK | SOV-RC-105 | Q |
| 2036 | TRANSFORMER | HEVI DUTY | TRF-PWR-29 | PM |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-101A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-101B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-102A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-102B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-103A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-103B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-104A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-104B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-105A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-105B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-106A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-106B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-107A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-107B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-108A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-108B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-109A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-109B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-110A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-110B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-111A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-111B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-112A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-112B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-113A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-113B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-114A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-AS-114B | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-BD-100A | Q |
| 2038 | TEMP SWITCH | FLUID COMPONENT | TS-BD-100B | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-102-A1 | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-102-A2 | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-102-B1 | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-102-B2 | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-103-A1 | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-103-A2 | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-103-B1 | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-103-B2 | Q |

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DUQUESNE LIGHT COMPANY
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| EQ ITEM | DESCRIPTION | MANUFACTURER | MARK NUMBER | STATUS |
|---|---|---|---|---|
| 2042 | SOLENOID | VALCOR | SOV-HY-104-A1 | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-104-A2 | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-104-B1 | Q |
| 2042 | SOLENOID | VALCOR | SOV-HY-104-B2 | Q |
| 2042 | SOLENOID | VALCOR | TV-CV-102 | Q |
| 2042 | SOLENOID | VALCOR | TV-CV-102-1 | Q |
| 2044 | SOLENOID | ASCO | SOV-CH-204 | Q |
| 2044 | SOLENOID | ASCO | SOV-SI-884A | Q |
| 2044 | SOLENOID | ASCO | SOV-SI-884B | Q |
| 2044 | SOLENOID | ASCO | SOV-SI-884C | Q |
| 2045 | CABLE SPLICE | RAYCHEM | X-N/A | Q |
| 2046 | TERMINAL BLK | PENN UNION | TB-805 | Q |
| 2046 | TERMINAL BLK | PENN UNION | TB-806 | Q |
| 2047 | CABLE SPLICE | RAYCHEM | X-N/A | Q |
| 2051 | RELAY | AMERACE CORP | RELAY 152A-BXAE | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-152-BXAE | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-152-BXDF | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-152A-BXDF | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-1R | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-2R | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-3R | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-4R | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-52-BXAE | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-52-BXDF | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-5R | Q |
| 2051 | RELAY | AMERACE CORP | RELAY-6R | Q |
| 2062 | REST TEMP DET | RDF CORP | NOT ASSIGNED | Q |
| 2064 | TERMINAL BLK | MARATHON | X-N/A | Q |
| 2064 | TERMINAL BLK | MARATHON | X-N/A | Q |
| 2066 | PRESS TRANS | ROSEMOUNT | PT-LM-101A | Q |
| 2066 | PRESS TRANS | ROSEMOUNT | PT-LM-101B | Q |
| 2067 | RAD DETECTOR | KAMAN | RIS-NSC-05A | DI |
| 2067 | RAD DETECTOR | KAMAN | RIS-NSC-05B | DI |
| 2068 | MICRO-PROCESSOR | KAMAN | MICRO-PROC-A | DI |
| 2068 | MICRO-PROCESSOR | KAMAN | MICRO-PROC-B | DI |
| 2073 | LEVEL TRANS | GEMS | LT-DA100 | PM |
| 2073 | LEVEL TRANS | GEMS | LT-RS151A | PM |
| 2073 | LEVEL TRANS | GEMS | LT-RS151B | PM |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | CS-30 | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | CS-31 | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | CS-32 | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | CS-33 | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | CS-39 | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | CS-8N15 | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | CS99P15 | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | HS-CV-102-1X | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | HS-CV-102X | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | HS-CV-150AX | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | HS-CV-150BX | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | HS-SS-102A1X | Q |

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DUQUESNE LIGHT COMPANY
EQ STATUS

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| EQ ITEM | DESCRIPTION | MANUFACTURER | MARK NUMBER | STATUS |
|---|---|---|---|---|
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | HS-SS-102A2X | Q |
| 2 81 | SELECTOR SWITCH | WESTINGHOUSE | HS-SS-105A1X | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | HS-SS-105A2X | Q |
| 2081 | SELECTOR SWITCH | WESTINGHOUSE | X-N/A | Q |
| 2106 | REST TEMP DET | ROSEMONT | TRB-RC-413 | Q |

Q = QUALIFIED
CQ = CONDITIONALLY QUALIFIED
DI = DOCUMENTATION INCOMPLETE
SC = SIGNIFICENT CONCERN
PM = PENDING MODIFICATION
E = EXEMPT FROM QUALIFICATION

ENCLOSURE 3

JUSTIFICATIONS FOR CONTINUED OPERATION

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 10

Franklin Tab 29, 30, 31, 32, 33, 34, 35
79-01B Tab 10

ASCO Solenoid Valves

| | |
|---|---|
| SOV-CC-103A1 | RC Pump A Cooling Inlet Isolation |
| SOV-CC-103B1 | RC Pump B Cooling Inlet Isolation |
| SOV-CC-103C1 | RC Pump C Cooling Inlet Isolation |
| SOV-CC-105D1 | RC Pump Cooling Outlet Isolation |
| SOV-CC-105E1 | RC Pump Cooling Outlet Isolation |
| SOV-CC-107D1 | RC Pump Thermal Barrier Outlet Isolation |
| SOV-CC-107E1 | RC Pump Thermal Barrier Discharge Valve |
| SOV-CC-110D | Containment Air Recirculation Coolers Discharge Isolation |
| SOV-CC-110E3 | Containment Air Recirculation Coolers Inlet Isolation |
| SOV-CC-111A2 | CRDM Shroud Cooling Supply Isolation |
| SOV-CC-111D1 | CRDM Shroud Cooling Outlet Isolation |
| SOV-CH-200A1 | Letdown Orifice Isolation Valve |
| SOV-CH-200B1 | Letdown Orifice Isolation Valve |
| SOV-CH-200C1 | Letdown Orifice Isolation Valve |
| SOV-CV-102-1 | Air Activity Monitor Outlet |
| SOV-DA-100A | Containment Sump Pump Discharge |
| SOV-DG-108A | Primary Drains Transfer Pump |
| SOV-DG-109A2 | Primary Drains Transfer Pump Vent |
| SOV-LM-101A | Containment Vacuum & Leakage Monitoring |
| SOV-LM-101B | Containment Vacuum & Leakage Monitoring |
| SOV-RC-455C1 | Pressurizer Power Relief |
| SOV-RC-455C2 | Pressurizer Power Relief |
| SOV-RC-455D1 | Pressurizer Power Relief |
| SOV-RC-455D2 | Pressurizer Power Relief |
| SOV-RC-456-1 | Pressurizer Power Relief |

| | |
|---|---|
| SOV-RC-456-2 | Pressurizer Power Relief |
| SOV-SI-101-2 | Nitrogen to Accumulator Isolation Valve |
| SOV-SS-000A | Containment Isolation Sampling System |

I. SER QUALIFICATION DEFICIENCIES

Solenoid valves need conduit seals.

II. JUSTIFICATION FOR CONTINUED OPERATION

The fact that the existing solenoid valves are not installed with conduit seals is not a concern as demonstrated by the failure modes and effects analysis described herein. Due to the unsealed installed condition, the steam and caustic sprays could enter the coil enclosure and cause the coil to fail open circuited, grounded or short circuited. A failure mode and effects analysis shows that for each failure mode two initial operational states for the associated coil must be considered: solenoid initially energized and solenoid initially de-energized.

With the solenoid initially energized, coil failures will affect the solenoid and air-operated valves as follows. If the coil fails open circuited the solenoid will be de-energized and cause the associated air-operated valve to go to its fail safe position (closed) and need not be considered further as this is the required safety position. A failure resulting in a single ground would have no effect on the battery power supply which is ungrounded. A short circuit would at most result in the trip of the circuit breaker that feeds the solenoid. This failure would de-energize the solenoid resulting in the associated air-operated valve going to its fail safe position (closed). This type of failure would be analogous to loss of air supply to the valve.

If the solenoid is initially de-energized it will be due to any of three possible conditions, not including the coil failure itself. These three conditions are (1) loss of power, (2) control switch failed open or held continuously in CLOSE position, and (3) containment isolation signal. For the three above mentioned conditions, coil failure has no affect on the solenoid.

Therefore, no significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environmental resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 11

Franklin Tab #59
79-01B Tab #11

NAMCO EA 180 LIMIT SWITCHES

| | |
|---|---|
| LMS-CC-105D1 | RCP Cooling Outlet Isolation |
| LMS-CC-111D1 | CRDM Shroud Cooler Outlet Isolation |
| LMS-CH-200A | Letdown Orifice Isolation |
| LMS-CH-200B | Letdown Orifice Isolation |
| LMS-CH-200C | Letdown Orifice Isolation |
| LMS-RC-455C | Pressurizer Power Relief |
| LMS-RC-455D | Pressurizer Power Relief |
| LMS-RC-456 | Pressurizer Power Relief |
| LMS-SI-101-2 | Nitrogen Supply to Safety Injection Accumulation |
| LMS-SI-865A | Safety Injection Accumulator Discharge Valve |
| LMS-SI-865B | Safety Injection Accumulator Discharge Valve |
| LMS-SI-865C | Safety Injection Accumulator Discharge Valve |

I. SER QUALIFICATION DEFICIENCIES

Inadequate steam exposure.

II. JUSTIFICATION FOR CONTINUED OPERATION

NAMCO limit switches located in-containment (except LMS-SI-865A, LMS-SI-865B, LMS-SI-865C) are used in air-operated valve dc solenoid control circuits. Under normal operating conditions, the valve solenoids are energized and their associated air-operated isolation valves are open. The solenoids are kept in the energized state or "sealed-in" by means of NAMCO limit switches. Figure 1 shows a typical control circuit for an air-operated valve using a limit switch for "seal-in". The NAMCO EA 180 limit switches provide position indication for the air operated valve. This

indication circuit consists of position indicating lights in the control room. No automatic safety functions are associated with this valve position indication circuit. NAMCO EA 180 limit switches are used to provide annunciator reflash for MOV-SI-865 A, B, and C.

It should be noted that associated stem mounted limit switches may give an erroneous valve position indication. This is acceptable since the operator can verify containment isolation by verifying that the redundant isolation valve is closed and that the operator is not required to reposition these valves post-LOCA or utilize their position indication to establish operating procedures.

Protection against loss of containment isolation is provided by redundant air-operated valves located outside of containment (TV-CC-105D2, TV-CC-111D2, TV-CH-204, TV-SI-101-1). Because these valves and their control elements are located outside containment they are not subject to the adverse environment resulting from the postulated initiating event.

However, to protect against the unlikely event that this valve experiences a random failure and does not isolate, procedural changes were instituted on December 3, 1980 to provide guidance to the control room operator to check for successful operation of these valves and for actions to be taken prior to resetting any emergency safety features or containment isolation function.

No significant degradation of any safety function or misleading

information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

FAILURE MODE ANALYSIS

The switches can fail open, grounded, or closed. A failure mode and effects analysis shows that for each failure mode two initial conditions for the associated solenoid must be considered: Solenoid initially energized and solenoid initially de-energized.

With the solenoid initially energized, limit switch failures will affect the solenoid and air-operated valve as follows. If the switch fails open, it will de-energize the solenoid and cause the associated air-operated valve to go to its fail safe position (closed) and need not be considered any further. A failure resulting in a single ground would have no effect on the battery power supply which is ungrounded. Multiple grounds could result in a trip of the circuit breaker that feeds the solenoid. This failure would cause de-energization of the solenoid resulting in the associated air-operated valve going to its fail safe position (closed) (Refer to Figure 1). This type of failure would be analogous to loss of air supply to the valve.

If the solenoid is initially de-energized it will be due to any of three possible conditions, not including the limit switch failure itself. These conditions are (1) loss of power, (2) control switch failed open or held continuously in CLOSE position, and (3) containment isolation signal. For the first two conditions, limit switch failure has no effect on the solenoid. For the third condition (containment isolation signal present), should the limit switch fail

open, there would be no immediate effect. Subsequent to the failure, it would not be possible to re-open the air-operated valve unless the control switch were held continuously in the OPEN position. However, this condition has no effect on the ability of the valve to perform its safety function, i.e. to close.

In the event that containment isolation is called for and the limit switch fails closed, the isolation function will be performed as required. However, when the isolation signal is subsequently reset, the failed limit switch would cause its associated solenoid to be re-energized resulting in a re-opening of the air-operated isolation valve (Refer to Figure 1).

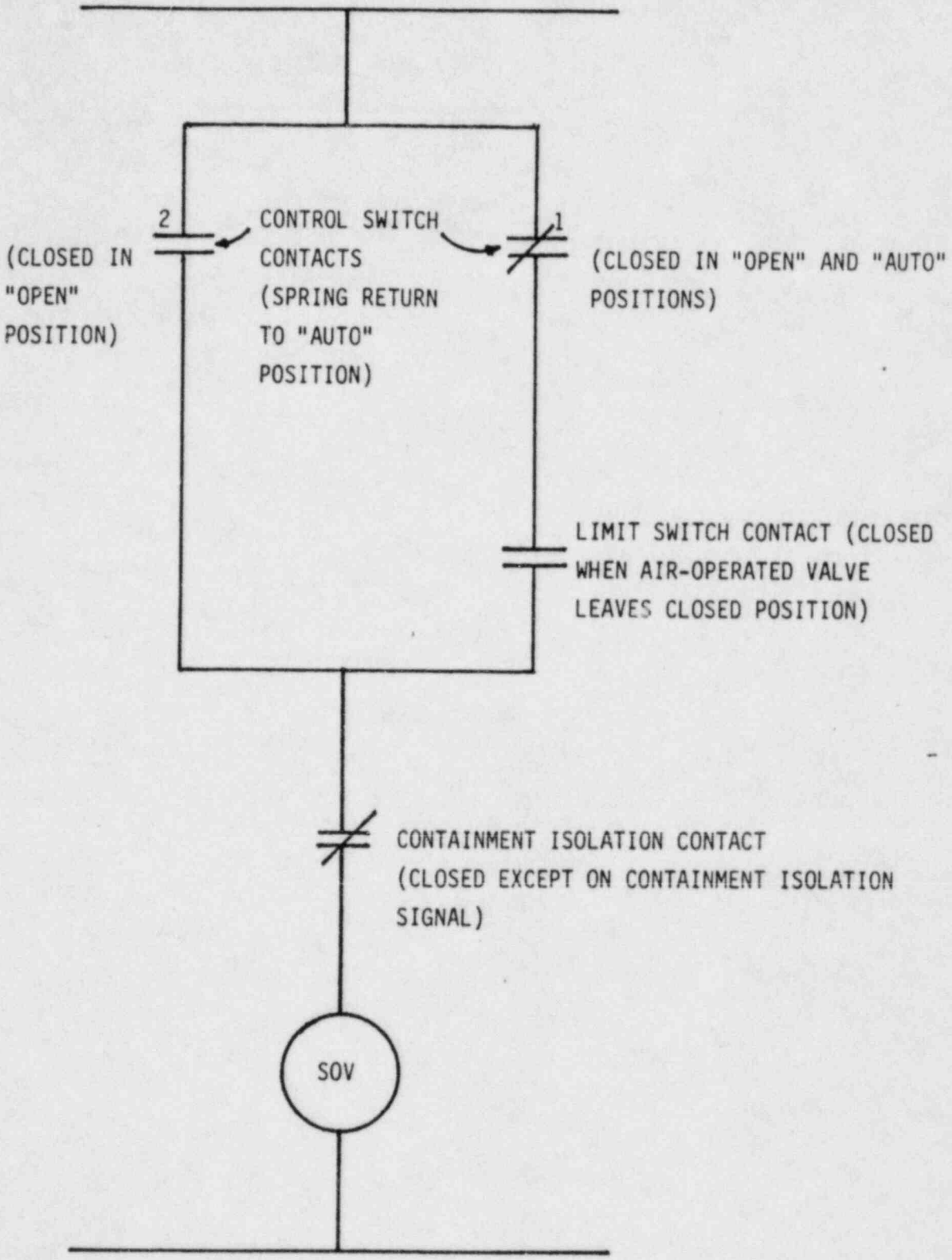


FIGURE 1
TYPICAL LIMIT SWITCH "SEAL-IN" CIRCUIT
FOR CONTAINMENT ISOLATION VALVE

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 13

Franklin Tab #57
79-01B Tab #13

NAMCO EA 740 LIMIT SWITCHES

| | |
|---|---|
| LMS-CC-103A1 | RCP Cooling Water Inlet Isolation |
| LMS-CC-103B1 | RCP Cooling Water Inlet Isolation |
| LMS-CC-103C1 | RCP Cooling Water Inlet Isolation |
| LMS-CC-105E1 | RCP Cooling Water Outlet Isolation |
| LMS-CC-107D1 | RCP Thermal Barrier Outlet Isolation |
| LMS-CC-107E1 | RCP Thermal Barrier Outlet Isolation |
| LMS-CC-110D | Containment Air Recirculation Discharge Isolation |
| LMS-CC-110E | Containment Air Recirculation Inlet Isolation |
| LMS-CV-111A2 | CRDM Shroud Coolers Supply Isolation |
| LMS-CV-102-1 | Air Activity Monitor Outlet |
| LMS-DA-100A | Containment Sump Pump Discharge |
| LMS-DG-108A | Containment Isolation Drains (Hydro) System |
| LMS-DG-109A2 | Primary Drains Transfer Tank Vent |

I. SER QUALIFICATION DEFICIENCIES

Inadequate steam exposure.

II. JUSTIFICATION FOR CONTINUED OPERATION

NAMCO limit switches located in-containment and shown on the master list are used in air-operated valve dc solenoid control circuits. Under normal operating conditions, the valve solenoids are energized and their associated air-operated containment isolation valves are open. The solenoids are kept in the energized state or "sealed-in" by means of NAMCO limit switches. Figure 1 shows a typical control circuit for an air-operated valve using a limit switch for "seal-in". The limit switches also provide position indication for the air operated valves. This indication circuit consists of OPEN/SHUT lights in the control room. No automatic safety functions are associated with this valve position indication circuit.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 13
(Continued)

Protection against a loss of isolation is provided by a redundant air-operated valve located outside of containment. Because these valves and their control elements are located outside containment they are not subject to the adverse environment resulting from the postulated initiating event. However, to protect against the unlikely event that this valve experiences a random failure and does not isolate, procedural changes were instituted on December 3, 1980 to provide guidance to the control room operator to check for successful operation of these valves and for actions to be taken prior to resetting any emergency safety features or containment isolation function.

It should be noted that associated stem mounted limit switches may give an erroneous valve position indication. This is acceptable since the operator can verify containment isolation by verifying that the redundant isolation valve is closed and that the operator is not required to reposition these valves post-LOCA or utilize their position indication to establish operating procedures.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

FAILURE MODE ANALYSIS

The switches can fail open, grounded, or closed. A failure mode and effects analysis shows that for each failure mode two initial conditions for the associated solenoid must be considered: Solenoid initially energized and solenoid initially de-energized.

With the solenoid initially energized, limit switch failures will affect the solenoid and air-operated valve as follows. If the switch fails open, it will de-energize the solenoid and cause the associated air-operated valve to go to its fail safe position (closed) and need not be considered any further. A failure resulting in a single ground would have no effect on the battery power supply which is ungrounded. Multiple grounds could result in a trip of the circuit breaker that feeds the solenoid. This failure would cause de-energization of the solenoid resulting in the associated air-operated valve going to its fail safe position (closed) (Refer to Figure 1).

If the solenoid is initially de-energized it will be due to any of three possible conditions, not including the limit switch failure itself. These conditions are (1) loss of power, (2) control switch failed open or held continuously in CLOSE position, and (3) containment isolation signal. For the first two conditions, limit switch failure has no effect on the solenoid. For the third condition (containment isolation signal present) should the limit switch fail open, there would be no immediate effect. Subsequent to the failure, it would not be possible to re-open the air-operated valve unless the control switch were held continuously in the OPEN position. However, this condition has no effect on the ability of the valve to perform its safety function, i.e. to close.

In the event that containment isolation is called for and the limit switch fails closed, the isolation function will be performed as required. However, when the isolation signal is subsequently reset, the failed limit switch would cause its associated solenoid to be re-energized resulting in a re-opening of the air-operated isolation valve (Refer to Figure 1).

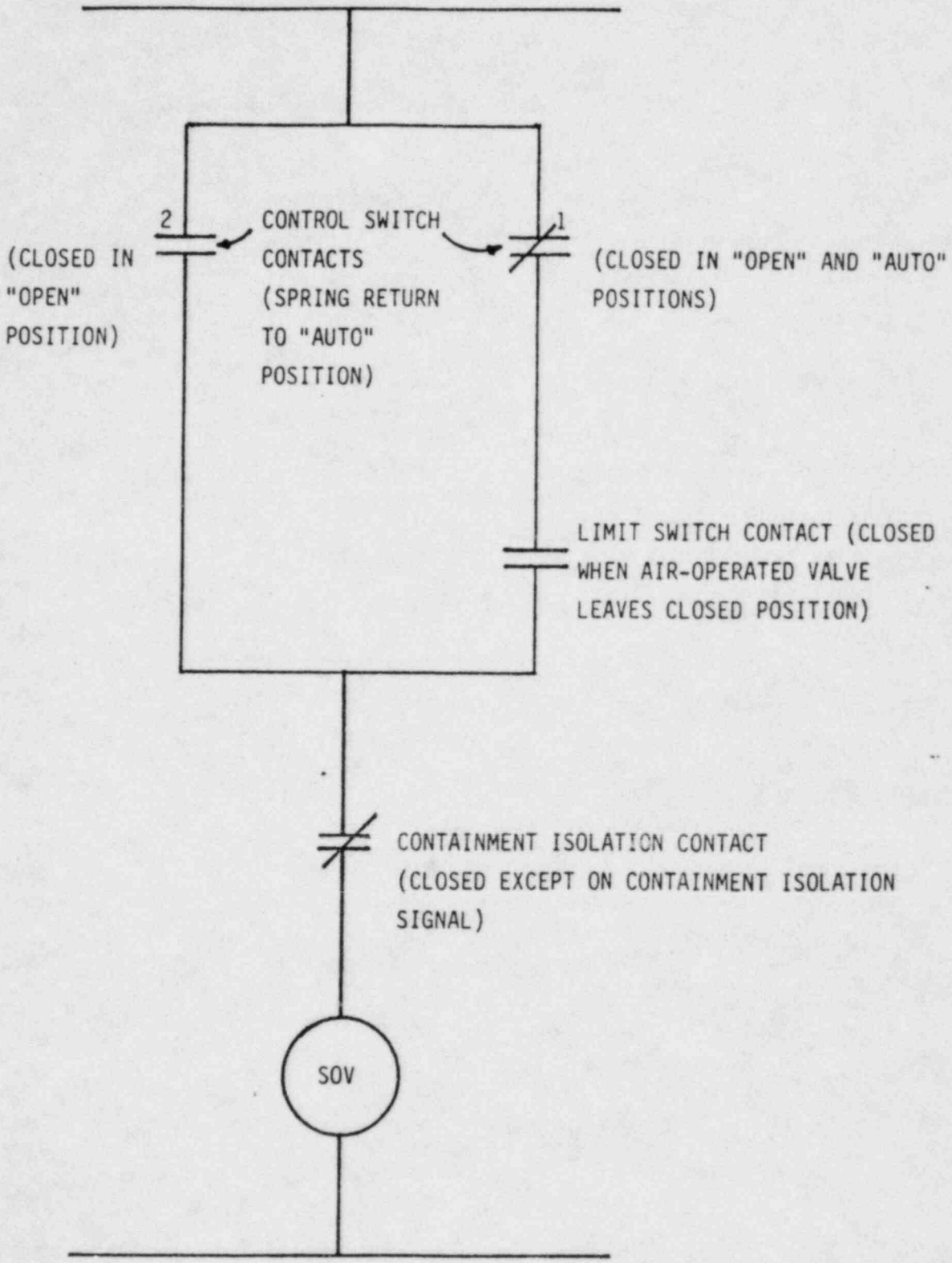


FIGURE 1
TYPICAL LIMIT SWITCH "SEAL-IN" CIRCUIT
FOR CONTAINMENT ISOLATION VALVE

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 14

Franklin Tab #38
79-01B Tab #14

Fischer Porter Flow Transmitters

| | |
|---|---|
| FT-MS-474 | Steam Generator A Main Steam Flow |
| FT-MS-475 | Steam Generator A Main Steam Flow |
| FT-MS-484 | Steam Generator B Main Steam Flow |
| FT-MS-485 | Steam Generator B Main Steam Flow |
| FT-MS-494 | Steam Generator C Main Steam Flow |
| FT-MS-495 | Steam Generator C Main Steam Flow |

I. SER QUALIFICATION DEFICIENCIES

Steam, radiation, and spray exposures are not satisfactory.
Margin for test time is inadequate.
Test failure criteria is lacking.

II. JUSTIFICATION FOR CONTINUED OPERATION

The function of these Fischer-Porter transmitters is to provide a short-term protective trip action.

The effects of steam flow transmitter failure on these systems and the justification of their acceptability in the interim period until they are replaced are as follows:

The protective trip function to mitigate a feedline rupture is a low steam generator level coincident with steam-feed mismatch in the non-faulted steam generator and low-low steam generator level in the faulted steam generator. The current transmitter qualification is considered adequate to perform the trip because of the completion of the function early-on in an accident scenario, the only concern is one of margin. Nevertheless, even

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 14
(Continued)

if failure of these units is assumed the trip function will be provided by low-low steam generator water level in the faulted steam generator (qualified Barton Lot 2, LT-FW-474 to 476, 484 to 486, to 494 to 496).

No significant degradation of any safety function nor misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 15

Franklin Tab #36
79-01B Tab #15

Barton 386 Flow Transmitters

| | |
|---|---|
| FT-SI-961 | High Head Safety Injection Flow |
| FT-SI-962 | High Head Safety Injection Flow |
| FT-SI-963 | High Head Safety Injection Flow |

I. SER QUALIFICATION DEFICIENCIES

Similarity
Aging
Test Duration
Chemical Spray
Submergence

II. JUSTIFICATION FOR CONTINUED OPERATION

The High Head Safety Injection (HHSI) Flow Indication is not used to perform an automatic protective function. The PAM function performed by the HHSI Flow as part of the Westinghouse expanded PAM system may be accomplished by the use of Boron Injection Tank Header Flow (FT-SI-943) (Outside Containment), Boron Injection Tank Pressure (PT-SI-943) (Outside Containment), Wide Range RCS Pressure (PT-RC-402, 403) (Qualified Barton-Lot 2), SI Valve Lineup Indications (Outside Containment), and SI Pump Motor Status (Outside Containment).

This device is not qualified for submerged operation. However, if this device is subjected to submergence and fails, its only function of monitoring (1) would have been accomplished prior to submergence and (2) can be performed by other devices as listed above. Furthermore, if an erroneous indication should occur due to

submergence, it should not mislead the operator since he has been trained not to relay on any single indication. Additional instrumentation is available for monitoring the adequacy of injection flow.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 16

Franklin Tab #49
79-01B Tab #16

Barton 764 (Lot 2) Level Transmitters

| | |
|---|---|
| LT-FW-474 | Steam Generator Narrow Range Level |
| LT-FW-475 | Steam Generator Narrow Range Level |
| LT-FW-476 | Steam Generator Narrow Range Level |
| LT-FW-484 | Steam Generator Narrow Range Level |
| LT-FW-485 | Steam Generator Narrow Range Level |
| LT-FW-486 | Steam Generator Narrow Range Level |
| LT-FW-494 | Steam Generator Narrow Range Level |
| LT-FW-495 | Steam Generator Narrow Range Level |
| LT-FW-496 | Steam Generator Narrow Range Level |
| LT-RC-459 | Pressurizer Level |
| LT-RC-460 | Pressurizer Level |
| LT-RC-461 | Pressurizer Level |

I. SER QUALIFICATION DEFICIENCIES

Aging
Chemical Spray

II. JUSTIFICATION FOR CONTINUED OPERATION

The chemical spray during the test is representative of the long term conditions (pH 8.5). The intent of the chemical sprays in this particular qualification testing is to increase the conductivity of any fluid which may leak into the unit, thereby creating a worst case situation. The testing of these Barton Transmitters showed that the test units did not leak, therefore the higher pH value used for the first hour will not invalidate the qualification.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 16
(Continued)

The assessment of aging was not a requirement in the qualification program for the Barton (Lot 2) Transmitter which was developed to IEEE-323-1971 criteria. With the large range of experience and with the amount of testing on this type of transmitter supplied by Westinghouse, it is highly unlikely that a significant in-service aging mechanism exists which could prejudice the qualification tests, performed by Westinghouse on the new transmitters, within a few years of installation. Aging has been addressed for the Barton (Lot 2) transmitters through testing by Westinghouse on similar transmitters and by an evaluation of the aging properties of the materials in the transmitters.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 17

Franklin Tab #41
79-01B Tab #17

GEMS Level Transmitter

LT-RS-151A Containment Sump Level
LT-RS-151B Containment Sump Level

I. SER QUALIFICATION DEFICIENCIES

Note: The original GEMS transmitters which were identified in the SER as having various deficiencies were replaced in 1982.

II. JUSTIFICATION FOR CONTINUED OPERATION

The original GEMS level transmitters were replaced in 1982 during the Second Refueling Outage with GEMS units presumed to be qualified. The qualification test reports and other documentation provided by GEMS were reviewed by Duquesne Light to evaluate the qualification of these transmitters and receivers. This review indicated that the transmitter units, although judged to be the best available at the time of procurement, may not be able to perform their long term required functions following a DBA at BVPS Unit No. 1. It is anticipated that they will function well early-on in an accident scenario.

GEMS has informed Duquesne Light Company that a new model of the transmitter has been developed and successfully tested to IEEE 323-74 and IEEE 344-75 Standards. This qualified model differs from our installed units in the substitution of some of the component materials. The new model has been ordered and an evaluation of the differences has been performed.

The only significant difference is in the type of fill fluid utilized in the unit. Our review indicates that although the fluid in the

installed unit is more sensitive to radiation effects, this would not be detrimental to the short term operation of the unit.

The installed containment sump level transmitter should operate in the early stages of an accident when it can be used by operators in recognizing and assessing abnormal containment conditions. This is only one of several means available to aid the operator in his assessment. A possible failure of the transmitter could occur after a period of radiation exposure, by which time the operator would be aware of containment conditions.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 19

Franklin Tab #47
79-01B Tab #19

Fischer-Porter Pressure Transmitters

| | |
|---|---|
| PT-RC-472 | Pressurizer Relief Tank Pressure |
| PT-RS-152A | Inside Recirculation Spray Pump Discharge Pressure |
| PT-RS-152B | Inside Recirculation Spray Pump Discharge Pressure |

I. SER QUALIFICATION DEFICIENCIES

Steam, radiation and spray exposures are not satisfactory.
Margin for test time is inadequate.
Test failure criteria is lacking.

II. JUSTIFICATION FOR CONTINUED OPERATION

The function of the pressurizer relief tank's Fischer-Porter pressure transmitter is to provide post-accident monitoring back-up for the pressurizer relief valve indication system.

This instrument has no impact on control or protection systems. Present operating procedures require the operator to verify that the pressurizer PORV's are closed. Should the original transmitter fail, the operator has been trained to refer to redundant instrumentation.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 19
(Continued)

The following list of instrumentation is additionally available to the operator to perform this verification:

1. Limit Switches on the PORV's (LMS-RC-455C, 455D, and 456; Index Item 11).
2. Acoustic Monitor (Index Item 27).
3. RCS Wide Range Pressure (PT-RC-402 and 403; Index Item 20).
4. Pressurizer Pressure (PT-RC-455, 456, and 457; Index Item 20).
5. PORV Block Valve Position (MOV-RC-535, 536, 537; Index Item 25).

The function of the Fischer-Porter inside recirculation spray pump discharge pressure transmitters is to provide control board indication. An alternate means of obtaining the required information is by monitoring the pump ammeters which will provide a quantitative correlation to the pump discharge pressure. From a system redundancy standpoint, there is also a redundant 100% outside recirculation spray system.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 20

Franklin Tab #46
79-01B Tab #20

Barton 763 (Lot 2) Pressure Transmitters

| | |
|---|---|
| PT-RC-402 | RCS Wide Range Pressure |
| PT-RC-403 | RCS Wide Range Pressure |
| PT-RC-455 | RCS Wide Range Pressure |
| PT-RC-455 | Pressurizer Pressure |
| PT-RC-456 | Pressurizer Pressure |
| PT-RC-457 | Pressurizer Pressure |

I. SER QUALIFICATION DEFICIENCIES

Aging
Chemical Spray

II. JUSTIFICATION FOR CONTINUED OPERATION

The chemical spray during the test is representative of the long term conditions (pH 8.5). The purpose of the chemical sprays in this particular qualification testing is to increase the conductivity of any fluid which may leak into the unit thereby creating a worst case situation. The testing of these Barton transmitters showed that the test units did not leak, therefore the higher pH value used for the first hour will not invalidate the qualification.

The assessment of aging was not a requirement in the qualification program for the Barton (Lot 2) Transmitter which was developed to IEEE-323-1971 criteria. With the large range of experience and with the amount of testing on this type of transmitter supplied by Westinghouse, it is highly unlikely that a significant in-service aging mechanism exists which could prejudice the qualification tests,

performed by Westinghouse on the new transmitters, within a few years of installation. Aging has been addressed for the Barton (Lot 2) transmitters through testing by Westinghouse on similar transmitters and by an evaluation of the aging properties of the materials in the transmitters.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 21

Franklin Tab #40
79-01B Tab #21

Barton 386 Level Transmitters

| | |
|---|---|
| LT-FW-477 | Steam Generator Wide Range Level |
| LT-FW-487 | Steam Generator Wide Range Level |
| LT-FW-497 | Steam Generator Wide Range Level |

I. SER QUALIFICATION DEFICIENCIES

Similarity
Aging
Test Duration
Chemical Spray

II. JUSTIFICATION FOR CONTINUED OPERATION

The Steam Generator Wide Range Level indication is not used to perform an automatic protective function. The PAM function performed by the Steam Generator Wide Range Level as part of the Westinghouse expanded PAM system, may be accomplished by the use of the Steam Generator Narrow range Level (Qualified Barton Lot 2; Index Item 16; LT-FW-474, 475, 476, 484, 485, 486, 494, 495, and 496) or Steamline Pressure (Outside Containment; Index Item 42; PT-MS-474, 484, 494, 475, 495, 476, 486, 496), Wide Range $T_{(HOT)}$ and $T_{(COLD)}$ (Qualified Sostman; Index Item 22; TRB-RC-410, 420, 430, 413, 423, 433) and Auxiliary Feedwater Flow (Outside Containment; Index Item 40; FT-FW-100A, B, and C) whenever the level is below the Narrow Range Steam Generator Level span to determine if auxiliary feedwater is being fed to an intact Steam Generator. The long-term safe condition is water level within the narrow range span.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 21
(Continued)

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 23

Franklin Tab #55
79-01B Tab #23

Electric Thermometer Trinity Inc.

TRB-RS-150A Containment Sump Temperature
TRB-RS-150B Containment Sump Temperature

I. SER Qualification Deficiency

Inadequate evidence of qualification

II. Justification for Continued Operation

The Electric Thermometer Trinity Inc. RTD assembly was replaced by a Conax RTD during the 1982 Second Refueling Outage. The Conax unit is qualified for its intended function and a conduit seal is being installed during the Fourth Refueling Outage.

These RTD's serve only as a secondary confirmation of the containment sump level. Any failure or inaccuracies caused by the lack of a conduit seal would not cause operator confusion to result.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 25

Franklin Tab #2 and #90
79-018 Tab #25

Limitorque Motor-Operator

MOV-CH-310 Regenerative Heat Exchanger Charging Line Discharge Isolation Valve

MOV-SI-842 SI Accumulator Check Valve Test Line Containment Isolation Valve

I. SER Qualification Deficiencies

Similarity
Inadequate Documentation
Aging
Replacement Schedule

II. Justification for Continued Operation

(MOV-CH-310)

The motor-operator for MOV-CH-310 is located below flood level and was not qualified for submergence. MOV-CH-310 is required to close on receipt of a safety injection signal to block off the normal charging flow path for a positive flow path through the Boron Injection Tank.

To prevent submergence from having any possibility of causing a spurious opening of the valve, a modification was made at the motor control center during the Second Refueling Outage. Relays were installed to remove power from any control power feeds to the limit and torque switches whenever the valve is closed. Position indication was retained.

Because this valve is qualified for non-submergence conditions, operates early on during an accident, and has its power automatically removed upon valve closure it is deemed qualified as a system for its intended function.

Aging has been assessed and all of the valve parts have a qualified life in excess of 40 years.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

(MOV-SI-842)

Automatic isolation of MOV-SI-842 is initiated early in the accident transient upon receipt of a containment isolation phase A signal.

The subject containment penetration is also automatically isolated outside containment by TV-SI-889. This is an air operated valve that fails closed on loss of air or electrical power. This redundant valve is not subjected to the same inside containment adverse environmental conditions to which valve MOV-SI-842 is subjected. The automatic closure of TV-SI-889 on a containment isolation phase A signal will accomplish the safety function of containment isolation.

The MOV-SI-842 valve has a motor that contains Class B insulation and has a qualification operational time period of 8 hours as demonstrated by previous Limitorque testing. This valve's safety function will have been performed early on in an accident scenario upon receipt of the containment isolation phase A signal.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 25
(Continued)

No significant degradation of any safety function or misleading information to the operator as a result of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 26

Franklin Tab #56
79-01B Tab #26

G.E. Pump Motors

RS-P-1A Inside Recirculation Spray Pump Motors
RS-P-1B Inside Recirculation Spray Pump Motors

I. SER Qualification Deficiencies

Similarity
Motor Brake
Aging
Operating Time

II. Justification for Continued Operation

The equivalency between the tested model (G.E. #5K6319XJ1B) and purchased model (G.E. #5K6319XJ20A) is established. (Refer to Certificate of Conformance provided by G.E. for Requisition No. 297-81938, Customer order number 1-11462 dated March 27, 1975.)

The lead splice and lead cable insulation may be susceptible to some thermal degradation, however, information on their material content is currently being investigated. The data on hand indicates that the qualified life is justified based on previous testing of the stator and periodic replacement of the motor's lubricant.

An investigation of the motor's constituent parts had indicated that there is a high probability of the equipment operating for the post accident duration. This investigation was based on a study of the parts aging phenomenon and the motor's ability to operate under simulated DBE conditions.

We have determined that the motors will be operating continuously for the first 30 days and on an intermittent basis for 1/3 the time for the remaining 5 months. The total equivalent running time is expected to be 80 days in the 6 month interval post accident. As pointed out above, our investigation of the equipment's test report and materials review, indicates that the motor should remain operable for this post DBA period. In addition, the two fifty (50) percent design capacity, motor driven recirculation pumps that are located inside the containment are backed-up by two additional fifty (50) percent design capacity, motor driven recirculation spray pumps that are located inside the containment are backed-up by two additional fifty (50) percent design capacity, motor driven recirculation spray pumps that are located outside the containment. The containment depressurization system is designed in such a way that the recirculation spray subsystems, together with the quench spray subsystems, are capable of reducing the containment pressure to subatmospheric in less than 60 minutes and remain atmospheric, thus terminating all outleakage to the environment under any combination of credible events.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 27

Franklin Tab #51
79-01B Tab #27

ENDEVOC Accoustic Monitor

| | | | |
|---|---|---|---|
| FY-RC-100A1 | FY-RC-100B2 | FY-RC-101A1 | FY-RC-101B2 |
| FY-RC-100A2 | FY-RC-100C1 | FY-RC-101A2 | FY-RC-101C1 |
| FY-RC-100B1 | FY-RC-100C2 | FY-RC-101B1 | FY-RC-101C2 |

I. SER QUALIFICATION DEFICIENCIES

Inadequate qualification documentation.

II. JUSTIFICATION FOR CONTINUED OPERATION

Failure of the accoustic monitor has no impact on control or protection systems.

Present operating procedures require the operator to verify that the pressurizer PORV's are closed. Should the original transmitter fail, the operator has been trained to refer to redundant instrumentation.

The following list of instrumentation is additionally available to the operator to perform this verification:

1. Limit Switches on the PORV's (LMS-RC-455C, 455D, and 456; Index Item 11).
2. Pressure Relief Tank Level (PT-RC-470; Index Item 18).
3. Pressure Relief Tank Pressure (PT-RC-472; Index Item 19).
4. RCS Wide Range Pressure (PT-RC-402 and 403; Index Item 20).
5. Pressurizer Pressure (PT-RC-455, 456, and 457; Index Item 20).
6. PORV Block Valve Position (MOV-RC-535, 536, 537; Index Item 25).

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 27
(Continued)

If PORV closure cannot be verified due to a qualification deficiency, the operator will close the PORV Block Valves (MOV-RC-535, 536, and 537; Index Item 25).

Due to the redundancy of indication it has been determined that no significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 40

Franklin Tab #39, #43
79-01B Tab #40

Fischer-Porter Flow Transmitter

| | |
|---|---|
| FT-FW-100A | Steam Generator A Auxiliary Feedwater Flow |
| FT-FW-100B | Steam Generator B Auxiliary Feedwater Flow |
| FT-FW-100C | Steam Generator C Auxiliary Feedwater Flow |
| FT-RW-102A | River Water to Recirculation Spray Heat Exchanger |
| FT-RW-102B | River Water to Recircul :ion Spray Heat Exchanger |

I. SER QUALIFICATION DEFICIENCIES

No qualification documentation available.

II. JUSTIFICATION FOR CONTINUED OPERATION

A failure mode and effects analysis shows that the Fischer-Porter flow transmitters can fail in one of three modes; open circuited, grounded, or short circuited. An open circuit failure will result in a low scale flow indication. A failure resulting in a single ground would have no effect, since the 120 VAC vital bus is ungrounded. A failure resulting in a short circuit would result in a low flow indication and at most blow the transmitter power supply fuse, which would in turn also result in a low scale indication.

The above mentioned flow transmitter failure modes have no effect on system operation, since the operator will be able to (i) assess the auxiliary feedwater flow requirements by observing steam generator narrow range level indication, and (ii) assess river flow by monitoring the river water pump discharge pressure.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 40
(Continued)

The auxiliary feedwater and river water flow transmitters provide main control board indication with no automatic initiation functions. Steam generator level (narrow range) can be used to accomplish the auxiliary feedwater flow function. For example, a decreasing level in the demineralized water storage tank and a constant steam generator level indicates that there is sufficient auxiliary feedwater flow. The river water flow transmitters are used for post-LOCA mitigation only. The monitoring of the river water pump discharge pressure provides an alternate means for obtaining the required information.

The outside recirculation spray discharge pressure transmitters provide only control board indication with no automatic initiation function. An alternate means of obtaining the required information is by monitoring the pump ammeters which will provide a quantitative indication of pump discharge pressure. There is also a redundant 100% inside recirculation spray system.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 41

Franklin Tab #37, #42
79-01B Tab #41

Fischer-Porter Pressure Transmitter

| | |
|---|---|
| PT-RS-156A | Outside Recirculation Spray Pump Discharge Pressure |
| PT-RS-156B | Outside Recirculation Spray Pump Discharge Pressure |
| PT-LM-100A | Containment Pressure |
| PT-LM-100B | Containment Pressure |
| PT-LM-100C | Containment Pressure |
| PT-LM-100D | Containment Pressure |

I. SER QUALIFICATION DEFICIENCIES

Qualification documentation unavailable.

II. JUSTIFICATION FOR CONTINUED OPERATION

Pressure transmitters PT-SR-156A, B are located outside containment and provide control board indication with no automatic actuation function. These Fischer-Porter pressure transmitters are required only for post-LOCA mitigation.

A failure mode analysis shows that pressure transmitters can fail in one of three modes open circuited, grounded, or short circuited. An open circuit failure will result in a low scale pressure indication. A failure resulting in a single ground would have no effect, since the 120 VAC bus is ungrounded. The above mentioned pressure transmitter failure modes have no effect on system operation, since they only provide control board indication. An alternate means of obtaining the required information is by monitoring the pump ammeters, which will provide a quantitative indication of discharge pressure.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 41
(Continued)

The containment pressure transmitters PT-LM-100A, B, C, D are located outside containment in the safeguards area. These transmitters are used to generate containment isolation and safety injection actuations and also are required as a monitoring function to follow the course of the event.

A failure mode analysis shows that pressure transmitters can fail in one of three modes: open circuited, grounded, or short circuited. An open circuit failure will result in a low scale pressure indication. A failure resulting in a single ground would have no effect, since the 120 VAC bus is ungrounded. A failure resulting in a short circuit would at most blow the transmitter power supply fuse and result in a low scale pressure indication. The only harsh element that the transmitters are exposed is radiation and the transmitters are expected to be available to serve their safety-related function early-on in a postulated accident condition, because the environment around the transmitters will not change significantly until very late in the monitoring period as the total radiation dose gradually increases.

No significant degradation of any safety function or misleading information to the opeator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 42

Franklin Tab # 44
79-01B Tab #42

Fischer-Porter Pressure Transmitter

| | |
|---|---|
| PT-MS-474 | Steam Generator A Main Steam Discharge Pressure |
| PT-MS-475 | Steam Generator A Main Steam Discharge Pressure |
| PT-MS-476 | Steam Generator A Main Steam Discharge Pressure |
| PT-MS-484 | Steam Generator B Main Steam Discharge Pressure |
| PT-MS-485 | Steam Generator B Main Steam Discharge Pressure |
| PT-MS-486 | Steam Generator B Main Steam Discharge Pressure |
| PT-MS-494 | Steam Generator C Main Steam Discharge Pressure |
| PT-MS-495 | Steam Generator C Main Steam Discharge Pressure |
| PT-MS-496 | Steam Generator C Main Steam Discharge Pressure |

The Fischer-Porter main steam pressure transmitters are located in the auxiliary feedwater pump room where they can be exposed to 400,000 Rads of radiation (40 year dose) during LOCA conditions. These units will have performed their safety-related function in less than an hour and will be exposed to no more than 15,000 Rads within that period. For this type of harsh condition, the transmitters are not expected to degrade in operability or accuracy.

The initial plant piping design has been modified to exclude any pressurized steam lines from the auxiliary feedwater pump room via the relocation of auxiliary feedwater turbine block valves outside the cubicle. These valves require a safety-injection signal to open the block valve and therefore HELB conditions no longer be considered.

Another pressure transmitter, PT-MS-101 (A, B, or C) is also available to monitor the main steam line pressure and is located in a different part of the plant that would not be subjected to that particular steam line break condition.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 42
(Continued)

For other breaks inside and outside containment the transmitters environment will not change and they will perform their monitoring function. No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 47

Franklin Tab #63
79-01B Tab #47

Westinghouse Motors

SI-P-1A L.H.S.I. Pump Motors
SI-P-1B L.H.S.I. Pump Motors

I. SER Qualification Deficiencies

Evidence of qualification of motor splice materials
Lubricant-bearing-seal system
Required time for continuous motor operation

II. Justification for Continued Operation

Motor splice materials have now been qualified for 40 years plus post DBA.

Investigation of lubricant-bearing-seal system has demonstrated a high probability of operation for duration of a 6 month accident.

A thermal aging analysis for continuous motor operation assures motor will operate for 40 years of normal operation plus 6 months of post DBA.

Beaver Valley Unit I has the capability to cross-tie the Outside Recirculation Spray Pumps to the High Head Charging Pumps which provides additional redundancy for assuring long term integrity of the recirculation flowpath.

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 48

Franklin Tab #64
79-01B Tab #48

Westinghouse Motors

| | |
|---|---|
| CH-P-1A | Charging Pump Motors |
| CH-P-1B | Charging Pump Motors |
| CH-P-1C | Charging Pump Motors |

I. SER Qualification Deficiencies

Evidence of qualification of motor splice materials
Lubricant-bearing-seal system
Required time for continuous motor operation

II. Justification for Continued Operation

Motor splice materials have been qualified for 40 years plus DBA

Investigation of the lubricant-bearing-seal system has demonstrated a high probability of operation for duration of a 6 month accident.

A thermal aging analysis for continuous motor operation indicates that motor will operate for 40 years of normal operation plus 6 months of post DBA.

Multiple diverse core injection flow paths are provided by the Low Head, Outside Recirculation Spray and High Head Charging Pumps for providing adequate core cooling following the depressurization of the reactor coolant system post LOCA conditions.

JUSTIFICATION FOR CONTINUED OPERATION FOR INDEX ITEM NO. 48
(Continued)

No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event will occur.

ENCLOSURE 4

# METHODOLOGY FOR MASTER LIST DEVELOPMENT

# AND ENVIRONMENTAL SERVICE CONDITIONS

## METHODOLOGY FOR MASTER LIST DEVELOPMENT

The methodology for the development of the original plant equipment listing associated with 10CFR50.49, Paragraph (b) (1) involved a system by system review of several different plant documents including the following:

* Electrical Schematics
* Electrical Physical Drawings
* Emergency Operating Procedures
* Final Safety Analysis Report
* Electrical Equipment Lists
* Cable and Raceway Schedules
* Plant Service Conditions

After an initial listing was developed, Duquesne Light Company operations personnel then reviewed the list. This operation's review resulted in the addition of some equipment items and the deletion of other equipment that were not required to mitigate the consequences of an accident or bring the plant to a safe shutdown condition. This list contained harsh area electrical equipment that were expected to remain operable for all known design-basis events. For this equipment, the following items were considered when determining if the equipment would remain operable:

* The elementary wiring diagrams were reviewed to identify any auxiliary devices electrically connected directly into the control or power circuitry of the safety-related equipment whose failure due to postulated environmental conditions could prevent required operation of the safety-related equipment and;

* The operation of the safety-related systems and equipment were reviewed to identify any mechanical auxiliary systems that are directly connected with electrical components which are necessary for the required operation of the safety-related equipment.

* Nonsafety-related electrical circuits indirectly associated with the safety-related electrical equipment by common power supply or physical proximity were considered by a review of the electrical design including the use of applicable industry standards (e.g., IEEE, NEMA, ANSI, UL and ENC) and the use of properly coordinated protective relays, circuit breakers, or fuses for electrical fault protection.

Equipment that was reviewed that is classified as "important to safety" in accordance with Paragraph (b) (2) of 10CFR50.49 was considered by Duquesne Light Company to be safety-related and has been previously included in the Master List.

To comply with the requirements of Paragraph (b) (3) of 10CFR50.49 an additional preliminary listing was developed by examining the equipment being incorporated into the plant to satisfy Regulatory Guide 1.97 and NUREG 0737 as they relate to post accident monitoring. Safety-related equipment functions were reviewed along with the type of environmental exposure to determine what specific equipment is required to be qualified because of these NRC regulations.

This process involved the review of numerous types of plant documents similar to that examined for the initial BV-1 79-01B equipment with additional review of:

* NUREG 0737 Requirements
* Regulatory Guide 1.97 Requirements
* Design Change Package Documents
* Equipment Location Drawings

It should be noted that the Master Listing of additional equipment utilized a 2000 series of equipment item identification numbers. This allows the segregation of new or replacement equipment from the original 79-01B plant equipment items for ease in maintaining the plant's qualification record keeping system.

## ENVIRONMENTAL SERVICE CONDITIONS

The environmental service conditions for BV-1 were derived from detailed analyses of system energy breaks both inside and outside containment. The postulated Loss of Coolant Accident (LOCA), Main Steam Line Break (MSLB), and High Energy Line Break (HELB) effects are discussed in detail in the DLC EQ Submittal of October 15, 1981. Our actions are summarized below.

## ENVIRONMENTAL TEMPERATURE AND PRESSURE PROFILES INSIDE CONTAINMENT

The Duquesne Light Company EQ submittal to the NRC in October, 1981 identified containment environmental profiles consistent with LOCA pressure/temperature profiles presented in the Beaver Valley Unit 1 FSAR. This was done in accordance with Section 4.0 of the "Guidelines for Evaluating Environmental Qualfication of Class 1E, Electrical Equipment in Operating Reactors". Therefore, pressure and temperature values of 38 psig and 284°F were used for BV-1 equipment qualification.

In order to fulfill the requirements of the initial SER to provide a MSLB temperature profile, a profile generated for North Anna Units 1 and 2, assuming a 4.9 $ft.^2$ break upstream of the flow restrictor, was used which conservatively enveloped the postulated conditions at Beaver Valley Unit 1 under similar initiating conditions and assumptions. The resultant peak temperature of this analysis was 430°F.

Because of the short duration of the MSLB 430°F temperature spike, the original temperature profile, based on the LOCA temperature value of 284°F, was considered conservative for the following reasons:

1. The bulk superheated condition calculations had shown that the skin temperature of equipment had not exceeded their qualification temperatures.

2. FSAR Table 5.2-5 "FSAR Hot Leg DER in Summer" indicated the peak containment temperature during extended auxiliary feedwater flow through a faulted steam generator to be 269.3°F.

3. No safety-related electrical equipment is located in the upper third of the containment. This precludes any equipment from being exposed to a higher-than-average temperature due to stratification in the upper regions of the containment following a main steam line break.

4. Any stratification in the Beaver Valley Unit No. 1 containment will only be present for a short period of time, since all the spray systems are active within five minutes following a MSLB or LOCA. These systems include a minimum of three spray pumps and provide a minimum of 9,000 gpm from spray headers located in the upper regions of the containment. This high flow rate will quickly disperse any stratified steam in the upper regions of the containment.

A containment MSLB temperature analysis has recently been performed for BV-1. This analysis indicates a peak temperature of 350°F of approximately three (3) minutes in duration. This is considerably lower than the North Anna profile previously considered. An indicated peak MSLF pressure value of 45 psig is 7 psi greater than calculated for a LOCA. This increased pressure condition does not result in a lessening of the BVPS-1 equipment qualification status since applicable testing was conducted at pressures greater than 45 psig.

ENVIRONMENTAL TEMPERATURE AND PRESSURE PROFILES OUTSIDE CONTAINMENT

Evaluation of the temperature and pressure requirements for equipment qualification was performed in accordance with APCSB 3-1, Appendix B which resulted in the following building/areas being considered:

1. Auxiliary Building
2. Cable Vault Area
3. Main Steam Valve House

The following high energy line breaks were evaluated in the areas listed above as determined by the locations of safety related equipment, piping runs and buildings geometry:

1. Steam generator blowdown line
2. Auxiliary steam line
3. Main steam feed line to the auxiliary feed water pump turbine
4. Reactor coolant system letdown line
5. Decay heat release line header

## SUBMERGENCE

### Inside Containment

The submergence level inside containment (698'9") is predicted upon 100 percent drainage of the following tanks and systems into the available net free volume at the containment mat elevation:

1. Refueling Water Storage Tank
2. Safety Injection Accumulators
3. Boron Injection Tank
4. Reactor Coolant System
5. Chemical Addition Tank

### Outside Containment

Submergence of safety related equipment, due to the failure of high energy lines outside containment, is not a qualification concern due to the isolation of the fluid medium, either automatically or by operator action. The blowdown and auxiliary steam systems will be isolated in 10 and 30 seconds respectively, while the letdown line will be isolated in a maximum of 10 minutes (by operator action) or at 14% Pressurizer Level via a letdown isolation signal. Given these isolation times there will not be sufficient water discharge from the break to submerge any safety related equipment in either the primary auxiliary building or the cable vault pipe tunnel area.

ENCLOSURE 5

CHEMICAL SPRAY ANALYSIS

403.3.24/400K

## CHEMICAL SPRAY ANALYSIS

The NRC's SER had requested Duquesne Light Company's review of the plant's chemical spray concentration of boric acid solution. The NRC concern was that equipment qualification testing in several instances had been performed at lower concentrations of boric acid solution than the 15,000 ppm value that was identified in the plant's FSAR.

Duquesne Light Company investigated this concentration difference for a wide range of boric acid ppm values (8,000 to 20,000 ppm) when mixed with various percent weight solutions of sodium hydroxide and found the resulting changes to the solutions pH level to be minimal (See Table 1). The maximum pH sensivity of this range was a difference in pH of only 0.66 which occurred when the sodium hydroxide percent weight was 0.3. This amount of change in the pH results in a negligible amount of corrosion stress on the equipment.

The quench spray system is expected to have a boric acid concentration of 11,500 ppm buffered with a .3% weight of sodium hydroxide during accident conditions. The identified concern does not appear to be significant in terms of overall change in the pH of the spray solution and the difference is not considered great enough to invalidate any test results on the equipment.

As depicted in the Table 1, the pH level varies insignificantly with changes in boric acid PPM concentration over a range of 2,500 to 20,000 PPM.

TABLE 1

| Boric Acid (PPM) | Boron PPM | Sodium Hydroxide (wt%) | pH |
|---|---|---|---|
| 8,000 | 1,400 | 0.1 | 8.62 |
| 10,000 | 1,750 | 0.1 | 8.50 |
| 12,000 | 2,100 | 0.1 | 8.41 |
| 15,000 | 2,626 | 0.1 | 8.30 |
| 20,000 | 3,500 | 0.1 | 8.16 |
| 8,000 | 1,400 | 0.15 | 8.86 |
| 10,000 | 1,750 | 0.15 | 8.72 |
| 12,000 | 2,100 | 0.15 | 8.62 |
| 15,000 | 2,626 | 0.15 | 8.50 |
| 20,000 | 3,500 | 0.15 | 8.36 |
| 8,000 | 1,400 | 0.2 | 9.04 |
| 10,000 | 1,750 | 0.2 | 8.89 |
| 12,000 | 2,100 | 0.2 | 8.78 |
| 15,000 | 2,626 | 0.2 | 8.65 |
| 20,000 | 3,500 | 0.2 | 8.50 |
| 8,000 | 1,400 | 0.25 | 9.21 |
| 10,000 | 1,750 | 0.25 | 9.04 |
| 12,000 | 2,100 | 0.25 | 8.92 |
| 15,000 | 2,626 | 0.25 | 8.78 |
| 20,000 | 3,500 | 0.25 | 8.62 |
| 8,000 | 1,400 | 0.3 | 9.38 |
| 10,000 | 1,750 | 0.3 | 9.18 |
| 12,000 | 2,100 | 0.3 | 9.04 |
| 15,000 | 2,626 | 0.3 | 8.89 |
| 20,000 | 3,500 | 0.3 | 8.72 |

ENCLOSURE 6

EQ MAINTENANCE PROGRAM

403.3.24/400K

# EQ MAINTENANCE PROGRAM

## Basic System

Equipment maintenance qualification entails four closely-related programs: preventive maintenance, corrective maintenance, surveillance of equipment, and surveillance of maintenance activities. The preventive and corrective maintenance programs utilize the Maintenance Work Request and Failure Report (MWR&FR) form as the core document for work initiation and reporting. The MWR&FR documents the equipment problem, the effect on its associated system, the failure detection method, the cause of failure, and the corrective action. The MWR&FR is maintained as a hard copy in the equipment maintenance file and is used as the input to the computerized Maintenance Equipment History File (EHF) system and the Maintenance Planning and Scheduling (MP&S) file. This system is designed so that historical information can be reviewed and analyzed to determine if any recurring problems and trends exist.

## Replacement Scheduling

A program to schedule the specific times when equipment and their associated component parts must be replaced in order to maintain their respective qualified life values is now being included in the overall preventive maintenance program. This replacement scheduling is computerized and is designed to provide preventive maintenance schedule dates and work orders for part or equipment replacement.

## Aging Surveillance

With regard to the surveillance of safety-related equipment for degradation resulting from aging, a formalized program has been established for preventive maintenance activities. The program is currently being reviewed and expanded to make it more encompassing to facilitate records-keeping and trend analysis. The Preventive and Surveillance Maintenance procedures now in use include documenting periodic surveillance testing of specific equipment parameters, such as insulation resistance readings of coils and windings, and the comparing of this data with data previously recorded. This documentation system therefore provides some indication of ongoing degradation that may be occurring. These procedures will be expanded to include additional surveillance activities to help identify those equipment items which are likely to experience aging degradation as the result of either the environment at their installed locations or equipment wear. Plant maintenance personnel will receive additional training in the use of these updated procedures in order that they can more closely monitor the materials and components which are susceptible to age-related degradation.

## Maintenance Program Surveillance

The surveillance of maintenance activities involves the routine checking of maintenance functions to assess that periodic replacement of equipment or parts is occurring as per their established schedule to maintain the equipment qualified life. This surveillance will also evaluate the trending program so that effective age-degradation monitoring is occurring.