



**Duquesne Light**

Nuclear Division  
P.O. Box 4  
Shippingport, PA 15077-0004

Telephone (412) 393-6000

February 1, 1983

Director of Nuclear Reactor Regulation  
United States 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  
Response to 12/82 SER for Environmental  
Qualification of Safety-Related Electrical  
Equipment.

Gentlemen:

We have reviewed the NRC's December 1982 Safety Evaluation Report (SER) for the Environmental Qualification of Safety-Related Electric Equipment. The SER examined safety-related electrical equipment that are potentially exposed to a harsh environment. Based upon our review of each identified deficiency which could have an adverse impact on safety, we have determined that none of the identified deficiencies will impair the continued safe operation of the Station.

As directed by the SER, we are currently reviewing those electrical equipment items that have been categorized I.B, II.A, or II.B by the NRC and will provide plans for any additional corrective actions that may be necessary within the next 60 days, as directed. Our review of the equipment identified by the NRC in these categories has indicated that safe plant operation is not impaired. The justifications for continued operation that have been previously sent to the NRC remain valid, and additional justifications are provided (See Attachment A) for equipment in Categories I.B, II.A, or II.B.

We are currently reviewing with our equipment supplier, the current status of their proprietary positions regarding certain manufacturer's documentations that apply to qualification. At this time, final conclusion of their positions has not been completed, however, we are continuing to seek reclassification of the manufacturers information whenever possible.

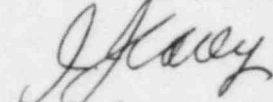
8302080302 830201  
PDR ADOCK 05000334  
P PDR

*Adac*

Beaver Valley Power Station, Unit No. 1  
Docket No. 50-334, License No. DPR-66  
Response to 12/82 SER for Environmental  
Qualification of Safety-Related Electrical  
Page 2

If you have any questions concerning this response, please  
contact my office.

Very truly yours,



J. J. Carey  
Vice-President, Nuclear

Attachment A: Additional Justifications for Continued Operation

cc: Mr. W. M. Troskoski, Resident Inspector  
U. S. Nuclear Regulatory Commission  
Beaver Valley Power Station  
Shippingport, PA 15077

U. S. Regulatory Commission  
c/o Document Management Branch  
Washington, DC 20555

United States Nuclear Regulatory Commission  
Office of Inspection and Enforcement  
Division of Reactor Inspections Operation  
Washington, DC 20555

United States Nuclear Regulatory Commission (3)  
Office of Inspection and Enforcement  
Attn: R. C. Haynes, Regional Director  
Region I  
631 Park Avenue  
King of Prussia, PA 19406

COMMONWEALTH OF PENNSYLVANIA)  
COUNTY OF BEAVER ) SS:

On this 1st day of February, 1983, before me, Sheila M. Fattore, a Notary Public in and for said Commonwealth and County, personally appeared J. J. Carey, who being duly sworn, deposed, and said that (1) he is Vice President of Duquesne Light, (2) he is duly authorized to execute and file the foregoing Submittal on behalf of said Company, and (3) the statements set forth in the Submittal are true and correct to the best of his knowledge, information and belief.

Sheila M. Fattore

SHEILA M. FATTORE, NOTARY PUBLIC  
SHIPPINGPORT BORO, BEAVER COUNTY  
MY COMMISSION EXPIRES SEPT. 16, 1985  
Member, Pennsylvania Association of Notaries

ATTACHMENT A

JUSTIFICATION FOR CONTINUED OPERATION

This section contains justification for continued operation for equipment in Categories I.B, II.A, or II.B that Duquesne Light Company has not provided justification for continued operation in their previous submittals. Duquesne Light Company continues to believe that this equipment is qualifiable and is pursuing the appropriate action to substantiate qualification with the appropriate documentation.

INDEX OF EQUIPMENT JUSTIFICATIONS

<u>EQUIPMENT TYPE</u>	<u>SECTION</u>
PUMP MOTORS -----	1
MOTOR OPERATED VALVES -----	2
CABLE -----	3
ELECTRICAL PENETRATIONS -----	4
TERMINAL BLOCKS -----	5
RHR EQUIPMENT -----	6

SECTION 1

FRANKLIN TAB #56  
79-01B TAB #26

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

I. SER Qualification Deficiencies

1. Traceability between installed and test equipment
2. Aging degradation and qualified life/replacement schedule
3. Temperature/pressure duration

II. Justification for Continued Operation

1. 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).
2. The lead splice and lead cable insulation may be susceptible to some thermal degradation, however, information on their material content is not available at the present time. This will have to be determined at the next outage. 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. The qualified life of the equipment's parts is currently being determined and the preventive maintenance replacement cycle schedule will be developed.
3. An investigation of the motor's constituent parts has 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 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.

-----

FRANKLIN TAB #64  
79-01B TAB #48

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

I. SER Qualification Deficiencies

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

II. Justification for Continued Operation

1. Motor splice materials have been qualified for 40 years plus DBA.
2. Investigation of the lubricant-bearing-seal system has demonstrated a high probability of operation for duration of a 6 month accident.
3. 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 cooling core cooling following the depressurization of the reactor coolant system post LOCA conditions.

-----  
FRANKLIN TAB #63  
79-01B TAB #47

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

I. SER Qualification Deficiencies

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

II. Justification for Continued Operation

1. Motor splice materials have now been qualified for 40 years plus post DBA.
2. Investigation of lubricant-bearing-seal system has demonstrated a high probability of operation for duration of a 6 month accident.
3. 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 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.

SECTION 2

FRANKLIN TAB #3  
79-01B TAB #25

MOV-RC-535, P.O.R.V. Block Valves  
MOV-RC-536, P.O.R.V. Block Valves  
MOV-RC-537, P.O.R.V. Block Valves

I. SER Qualification Deficiencies

- 1) Unable to establish similarity between test document and installed equipment.
- 2) It has not been identified if a motor-brake is used.
- 3) No aging analysis supplied.
- 4) Required operating time insufficient.

II. Justification for Continued Operation

The referenced MOV's safety function is to isolate the P.O.R.V. in the event of a P.O.R.V. failing in the open position. Two concurrent failures are not postulated of the P.O.R.V. & Block Valve. If the P.O.R.V. has failed, the additional failure of the block valve is not considered credible. The failure of both valves would involve simultaneous random failures and these are excluded from study. Overpressure protection is assured by the pressurizer safety relief valve.

There have been numerous tests performed on motor operated valves and the problem exists only in tying the test report to the equipment. The tests have demonstrated the ability of MOVs to function during simulated accident conditions.

If the valves are in the automatic mode of operation, additional protection is provided, because the pressurizer P.O.R.V.'s are automatically closed if reactor coolant system pressure decreases below 2000 psig.

-----  
FRANKLIN TAB #12  
79-01B TAB #45

MOV-SI-836, Cold Leg Injection Header Isolation  
MOV-SI-867C, B.I.T. Outlet Isolation  
MOV-SI-867D, B.I.T. Outlet Isolation  
MOV-SI-869A, Hot Leg Injection Header Isolation  
MOV-SI-869B, Hot Leg Injection Header Isolation

I. SER Qualification Deficiencies

1. Unable to establish similarity between test document and installed equipment.
2. It has not been identified if a motor-brake is used.

3. No aging analysis supplied.
4. Required operating time insufficient.

## II. Justification for Continued Operation

Similar MOVs have demonstrated operability during simulated accident conditions that are more severe than the Beaver Valley Power Station Unit 1 service condition and are documented in test reports.

The five MOVs isolate the parallel H.H.S.I. Flow Paths from the RCS. All valves are in the pipe tunnel and are normally closed during power operation. For LOCA, the only harsh stress mechanism is radiation. The existence of parallel flow paths assure accomplishment of safety injection in the event of a single failure. Failure of all redundant flow path valves is not credible because of the numerous diverse injection flow paths that are available upon receipt of a safety injection signal.

-----  
FRANKLIN TAB #15  
79-01B TAB #45

MOV-SI-860A, Sump Suction to L.H.S.I.  
MOV-SI-860B, Sump Suction to L.H.S.I.  
MOV-SI-862A, L.H.S.I. Suction from R.W.S.T.  
MOV-SI-862B, L.H.S.I. Suction from R.W.S.T.

### I. SER Qualification Deficiencies

1. Unable to establish similarity between test document and installed equipment.
2. It has not been identified if a motor-brake is used.
3. No Aging Analysis applied.
4. Required operating time insufficient.

## II. Justification for Continued Operation

The four MOVs are in the suction lines to L.H.S.I. pump A & B. They are located in the safeguard area, and will experience only an increase in radiation during a LOCA. It is not postulated for the four valves to fail simultaneously. In addition, a parallel flow path is available. These valves are positioned automatically on a safety injection system very early in a LOCA in coincidence with a low level signal from the R.W.S.T. level transmitters, therefore they attain their safety-related position prior to receiving significant radiation exposure.

The published test reports on this type of MOV has demonstrated its ability to operate during simulated accident conditions which are more severe than the service conditions the equipment is exposed to at Beaver Valley Power Station Unit 1.

-----

FRANKLIN TAB #10  
79-01B TAB #45

MOV-CH-289, Isolate Normal Charging Path  
MOV-CH-381, R.C.P. Seal Water Containment Isolation

I. SER Qualification Deficiencies

1. Unable to establish similarity between test document and installed equipment.
2. It has not been identified if a motor-brake is used.
3. No aging analysis supplied.
4. Required operating time insufficient.

II. Justification for Continued Operation

Currently the traceability between the installed equipment and the published test reports are being established. Both MOVs are located exterior to the containment and are used for containment isolation. The valves are placed in their accident position upon receipt of a safety injection signal and, therefore, would be closed prior to the more severe environmental conditions in containment during LOCA. For these valves, the only stress mechanism is radiation due to its location outside containment, and radiation is not expected to decrease the valves' operability.

-----  
FRANKLIN TAB #4  
79-01B TAB #25

MOV-CH-378, R.C.P. Seal Water Isolation

I. SER Qualification Deficiencies

- 1) Unable to establish similarity between test document and installed equipment.
- 2) It has not been identified if a motor-brake is used.
- 3) No aging analysis supplied.
- 4) Required operating time insufficient.

II. Justification for Continued Operation

This type of MOV has demonstrated the ability to function during simulated accident conditions that are more severe than those expected at Beaver Valley Power Station Unit 1, and document in a test report.

The referenced MOV is utilized for containment isolation of the seal water return for the RCPs. Should MOV-CH-378 fail to operate upon receipt of a containment isolation signal, isolation would be effectively accomplished utilizing MOV-CH-381.

The valve is placed in its accident position upon receipt of a safety injection signal and therefore would be closed prior to the more severe environmental conditions in containment post LOCA.

-----  
FRANKLIN TAB #86  
79-01B TAB #43

MOV-FW-151B Auxiliary Feedwater Pump Discharge  
Throttle Valve

I. SER Qualification Deficiencies

1. Unable to establish similarity between test document and installed equipment.
2. It has not been identified if a motor-brake is used.
3. No aging analysis supplied.

II. Justification for Continued Operation

The MOV is normally open and located in the Auxiliary Feedwater Pump Room. During an accident condition that would require this MOV to function, the valve, because of its location does not experience the severe environmental conditions of the accident. Similar MOVs have functioned under severe simulated accident conditions for worse service conditions than those occurring at Beaver Valley Power Station Unit 1. Should this valve fail to throttle properly, shutdown of the pump could be used to prevent overfill of the steam generator until a fixed throttle position could be manually set on the valve.

-----  
FRANKLIN TAB #1  
79-01B TAB #24

VS-D-5-3B,5B Containment Purge  
Containment Isolation Valves

I. SER Qualification Deficiencies

1. Traceability between tested and installed equipment.
2. Required operating time.
3. Qualified life of motor as a whole and not just the stator.

## II. Justification for Continued Operation

DLC continues to consider these items exempt for the following reasons:

VS-D-5-3B, 5B are the containment purge exhaust and supply isolation valves inside containment. Redundant isolation valves VS-D-5-3A, 5A are located outside containment. These valves are normally closed and are opened during Modes 5 & 6. They are not required to operate to mitigate either LOCA or a MSLB. These valves are administratively controlled in accordance with Technical Specifications.

Redundant isolation valves located outside containment are not subject to a LOCA or a MSLB and are opened only during Modes 5 & 6 thus ensuring containment isolation at all times.

SECTION 3



FRANKLIN TAB #69  
79-01B TAB #2

1000 Volt Cerro Wire Power Cable

I. SER Qualification Deficiencies

1. Traceability

II. Justification for Continued Operation

The traceability of the cable tested to cable installed has been established by a letter from the manufacturer linking test specimens to the cable purchased.

-----  
FRANKLIN TAB #73  
79-01B TAB #33

SIS Cable G.E. Vulkene Supreme #57279

I. SER Qualification Deficiencies

1. Traceability

II. Justification for Continued Operation

The traceability of the cable tested to the cable installed has been established and the qualified life has now been established. (Ref: Vendor Document WCD-830).

SECTION 4

## Viking Electrical Penetrations

### I. SER Qualification Deficiencies

1. Aging degradation not evaluated
2. Qualified life and replacement schedule not established
3. Radiation criteria not satisfied

### II. Justification for Interim Operation

Thermal aging analysis was conducted on the available elastomeric degradable parts such as "O" ring, gasket, insulator, and potting compound. Based on this analysis (Ref: Thermal Aging Analysis on Electrical Cable Penetrations, Technical Report), a qualified life greater than plant life has been established for these materials. The analysis on these materials indicates that the required 40 years plus DBE duration qualification time is enveloped.

The radiation analysis that has been performed, based on radiation threshold values, has demonstrated that no significant degradation of the penetration materials is expected to occur.

DLC is in the process of finalizing a retesting program on these penetrations at a higher radiation dosage level to affirm the foregoing discussion. A detailed schedule will be provided in the 90-day response. Based on this information, DLC believes the penetrations are qualified, therefore, continued operation is justified.

SECTION 5

FRANKLIN TAB #80  
79-01B TAB #8

PENN UNION TERMINAL BLOCKS

I. SER Qualification Deficiencies

1. Traceability of the number of terminal points between tested and installed equipment
2. Steam exposure

II. Justification for Continued Operation

Duquesne Light Test Report dated March 25, 1982, on the Penn Union Series 1000 terminal blocks that were tested to D.B.A. conditions indicated that no distortions or visual damages had occurred. The Penn Union terminal blocks tested were the 4 point and 8 point units.

As result of BVPS #1 plant walkdown and a review of plant drawings, no Penn Union 12 point terminal blocks have been identified in the plant.

• • •

SECTION 6

• FRANKLIN TAB #6,7,8,9,60  
79-01B TAB #28

RESPONSE TO SER QUALIFICATION DEFICIENCIES

ITEM: RHR System Components:

FRC TAB #	EQUIPMENT MARK #	EQUIPMENT TYPE	MANUFACTURER
6	MOV-CC-112 (SMB Series)	Motor Operators	Limitorque
7	MOV-RH-605 and RH-758	Motor Operators	Limitorque
8	MOV-RH-720A, B	Motor Operators	Limitorque
9	RH-P-1A, 1B	Pump Motors	Westinghouse
60	MOV-RH-700 and RH-701	Motor Operators	Limitorque

With the issuance of Supplement 3 of IEB 79-01B, the NRC has determined the review of environmental qualification for all equipment required to achieve and maintain the plant in a cold shutdown condition, is not within the scope of this report.

The equipment used in the Residual Heat Removal system can be classified under this category. Beaver Valley Unit 1 is licensed for a Hot Standby basis and is not required to have a Class IE qualified path to cold shutdown. For this reason, the equipment listed for the RHR system is considered to be exempt from qualification. The Recent NRC Rulemaking has continued to defer cold shutdown equipment from qualification consideration.