SAFETY EVALUATION REPORT BY THE
OFFICE OF NUCLEAR REACTOR REGULATION
EQUIPMENT QUALIFICATION BRANCH
FOR TOLEDO EDISON COMPANY
DAVIS-BESSE UNIT 1
DOCKET NO. 50-346

ENVIRONMENTAL QUALIFICATION OF SAFETY-RELATED ELECTRICAL EQUIPMENT

1 INTRODUCTION

General Design Criteria 1 and 4 specify that safety-related electrical equipment in nuclear facilities must be capable of performing its safety-related function under environmental conditions associated with all normal, abnormal, and accident plant operation. In order to ensure compliance with the criteria, the NRC staff required all licensees of operating reactors to submit a reevaluation of the qualification of safety-related electrical equipment which may be exposed to a harsh environment.

2 BACKGROUND

On February 8, 1979, the NRC Office of Inspection and Enforcement (IE) issued to all licensees of operating plants (except those included in the systematic evaluation program (SEP)) IE Bulletin IEB 79-01, "Environmental Qualification of Class IE Equipment." This bulletin, together with IE Circular 78-08 (issued on May 31, 1978), required the licensees to perform reviews to assess the adequacy of their environmental qualification programs.

Subsequently, Commission Memorandum and Order CLI-80-21 (issued on May 23, 1980) states that the DOR guidelines and portions of NUREG-0588 (which were issued on January 14, 1980, as enclosures 4 and 5 to IEB-79-01B) form the requirements that licensees must meet regarding environmental qualification of safety-related electrical equipment in order to satisfy those aspects of 10 CFR 50, Appendix A, General Design Criterion (GDC)-4. This order also requires the staff to complete safety evaluation reports (SERs) for all operating plants by February 1, 1981. In addition, this order requires that the licensees have qualified safety-related equipment installed in their plants by June 30, 1982.

Supplements to IEB 79-01B were issued for further clarification and definition of the staff's needs. These supplements were issued on February 29, September 30, and October 24, 1980.

In addition, the staff issued orders dated August 29, 1980 (amended in September 1980) and October 24, 1980 to all licensees. The August order required that the licensees provide a report, by November 1, 1980, documenting the qualification of safety-related electrical equipment. The October order required the establishment of a central file location for the maintenance of all equipment-qualification records. The central file was mandated to be established by December 1, 1980. The order also required that all safety-related electrical equipment be qualified by June 30, 1982. In

response, the licensee submitted information through letters dated April 3, August 14, and October 31, 1980.

2.1 Purpose

The purpose of this SER is to identify equipment whose qualification program does not provide sufficient assurance that the equipment is capable of performing the design function in hostile environments. The staff position relating to any identified deficiencies is provided in this report.

2.2 Scope

The scope of this report is limited to an evaluation of the equipment which must function in order to mitigate the consequences of a loss-of-coolant accident (LOCA) or a high-energy-line-break (HELB) accident, inside or outside containment, while subjected to the hostile environments associated with these accidents.

3 STAFF EVALUATION

The staff evaluation of the licensee's response included an onsite inspection of selected Class IE equipment and an examination of the licensee's report for completeness and acceptability. The criteria described in the DOR guidelines and in NUREG-0588, in part, were used as a basis for the staff evaluation of the adequacy of the licensee's qualification program.

The NRC Office of Inspection and Enforcement performed (1) a preliminary evaluation of the licensee's response, documented in a technical evaluation report (TER) and (2) an onsite verification inspection (May 5, 1980) of selected safety-related electrical equipment. Components of the containment air cooling system were inspected. The inspection verified proper installation of equipment, overall interface integrity, location with respect to flood level for equipment inside the containment, and manufacturers' nameplate data. The manufacturer's name and model number from the nameplate data were compared to information given in the Component Evaluation Work Sheets (CES) of the licensee's report. The site inspection is documented in a May 23, 1980 report. No deficiencies were noted. For this review, the documents referenced above have been factored into the overall staff evaluation.

3.1 Completeness of Safety-Related Equipment

In accordance with IEB 79-01B, the licensee was directed to (1) establish a list of systems and equipment that are required to mitigate a LOCA and an HELB and (2) identify components needed to perform the function of safety-related display information, post-accident sampling and monitoring, and radiation monitoring.

The staff developed a generic master list based upon a review of plant safety analyses and emergency procedures. The instrumentation selected includes parameters to monitor overall plant performance as well as to monitor the performance of the systems on the list. The systems list was established on the basis of the functions that must be performed for accident mitigation (without regard to location of equipment relative to hostile environments).

The list of safety-related systems provided by the licensee was reviewed against the staff-developed master list.

Based upon information in the licensee's submittal, the equipment location references, and in some cases subsequent conversations with the licensee, the staff has verified and determined that the systems included in the licensee's submittal are those required to achieve or support: (1) emergency reactor shutdown, (2) containment isolation, (3) reactor core cooling, (4) containment heat removal, (5) core residual heat removal, and (6) prevention of significant release of radioactive material to the environment. The staff therefore concludes that the systems identified by the licensee (listed in Appendix D) are acceptable, with the exception of those items discussed in Section 5 of this report.

Display instrumentation which provides information for the reactor operators to aid them in the safe handling of the plant was not specifically identified by the licensee. A complete list of all display instrumentation mentioned in the LOCA and HELB emergency procedures must be provided. Equipment qualification information in the form of summary sheets should be provided for all components of the display instrumentation exposed to harsh environments. Instrumentation which is not considered to be safety related but which is mentioned in the emergency procedure should appear on the list. For these instruments, (1) justification should be provided for not considering the instrument safety related and (2) assurance should be provided that its subsequent failure will not mislead the operator or adversely affect the mitigation of the consequences of the accident. The environmental qualification of post-accident sampling and monitoring and radiation monitoring equipment is closely related to the review of the TMI Lessons-Learned modifications and will be performed in conjunction with that review.

The licensee identified 395 items of equipment which were assessed by the staff.

3.2 Service Conditions

Commission Memorandum and Order CLI-80-21 requires that the DOR guidelines and the "For Comment" NUREG-0588 are to be used as the criteria for establishing the adequacy of the safety-related electrical equipment environmental qualification program. These documents provide the option of establishing a bounding pressure and temperature condition based on plant-specific analysis identified in the licensee's Final Safety Analysis Report (FSAR) or based on generic profiles using the methods identified in these documents.

On this basis, the staff has assumed, unless otherwise noted, that the analysis for developing the environmental envelopes for Davis-Besse Unit 1, relative to the temperature, pressure, and the containment spray caustics, has been performed in accordance with the requirements stated above. The staff has reviewed the qualification documentation to ensure that the qualification specifications envelope the conditions established by the licensee. During this review, the staff assumed that for plants designed and equipped with an automatic containment spray system which satisfies the single-failure criterion, the main-steam-line-break (MSLB) environmental conditions are enveloped by the large-break-LOCA

environmental conditions. The staff assumed, and requires the licensee to verify that the containment spray system is not subjected to a disabling single-component failure and therefore satisfies the requirements of Section 4.2.1 of the DOR guidelines.

Equipment submergence has also been addressed where the possibility exists that flooding of equipment may result from HELBs.

3.3 Temperature, Pressure, and Humidity Conditions Inside Containment

The licensee has provided the results of accident analyses as follows:

	Max Temp (°F)	Max Press (psig)	Humidity (%)
LOCA	264	36.95	100

The staff has concluded that the minimum temperature profile for equipment qualification purposes should include a margin to account for higher-than-average temperatures in the upper regions of the containment that can exist due to stratification, especially following a postulated MSLB. Use of the steam saturation temperature corresponding to the total building pressure (partial pressure of steam plus partial pressure of air) versus time will provide an acceptable margin for either a postulated LOCA or MSLB, whichever is controlling, as to potential adverse environmental effects on equipment.

The licensee's specified temperature (service condition) of 264°F does not satisfy the above requirement. Furthermore, the licensee's specified pressure is low as compared to plants of similar design. The licensee is requested to verify that the pressure profile in the FSAR was calculated based on the code requirements defined in NUREG-0588. If by using these codes the peak containment pressure is still 36.95 psig, then a saturation temperature corresponding to the pressure profile (283°F peak temperature at 36.95 psig) should be used. If, however, the calculated peak pressure is higher than 36.95 psig, then the saturation temperature corresponding to the new pressure profile should be used.

The staff notes that for the EEQ review the accidents which were used to evaluate equipment were LOCAs inside containment. As stated in Section 3.2 of this report, this plant is equipped with an automatic containment spray system. However, in view of the low containment pressure during the LOCA condition, the temperature inside the containment for the MSLB condition may exceed the LOCA profile and may be the limiting condition. The licensee should provide the results of the MSLB conditions, and, if the temperature or pressure from the MSLB exceeds the LOCA conditions, then the licensee should update his equipment summary tables to reflect this change. If there is any equipment that does not exceed the staff position, the licensee must provide either justification that the equipment will perform its intended function under the specified conditions or propose corrective action.

3.4 Temperature, Pressure, and Humidity Conditions Outside Containment

The licensee has provided the temperature, pressure, humidity and applicable environment associated with an HELB outside containment. The following rooms within the auxiliary building have been addressed: 236, 303, 304, 312, 313 (and annulus), 314 (and annulus), 404, 601, and 602.

The staff has verified that the parameters identified by the licensee for the MSLB are acceptable.

Many of the work sheets indicate that components are located in rooms listed above; however, they are marked N/A for temperature, pressure, and humidity qualification. Therefore, these areas have been identified as a deficiency for these components.

3.5 Submergence

The maximum submergence levels have been established and assessed by the licensee. Unless otherwise noted, the staff assumed for this review that the methodology employed by the licensee is in accordance with the appropriate criteria as established by Commission Memorandum and Order CLI-80-21.

The licensee's value for maximum submergence level is elevation 572 ft 2 in. Equipment below this level has been identified by the licensee. The licensee identified 51 safety-related electrical components--40 cables, 5 valve motor operators, 4 level transmitters, and 2 solenoid valves--as having the potential for becoming submerged after a postulated event. The licensee has stated that the cables, valve motor operators, and level transmitters perform their function before becoming submerged. For the two solenoid valves, the licensee states that other valves outside containment will provide a backup. In this regard, the licensee should provide an assessment of the failure modes associated with the submergence of all the above components. The licensee should also provide assurance that the subsequent failure of these components will not adversely affect any other safety functions or mislead an operator. Additionally, the licensee should discuss operating time, across the spectrum of events, in relation to the time of submergence. If the results of the licensee's assessment are acceptable, then the components may be exempt from the submergence parameter of qualification.

It is not clear from the information submitted that submergence of safety-related electrical equipment outside of containment was addressed. The licensee should address this area more specifically in the 90-day response and upgrade the CES as appropriate.

3.6 Chemical Spray

The licensee's specified value for the chemical concentration is 1800 ppm boric acid solution with a pH of 5.0. When qualification values are given, the exact chemical concentration and pH are not specified, or the pH value only is shown, or the pH value appears not to envelope the specified value. Therefore, for the purpose of this review, the effects of chemical spray will be considered unresolved. The staff will review the licensee's response when it is submitted and discuss the resolution in a supplemental report.

3.7 Aging

Section 7 of the DOR guidelines does not require a qualified life to be established for all safety-related electrical equipment. However, the following actions are required:

(1) Make a detailed comparison of existing equipment and the materials identified in Appendix C of the DOR guidelines. The first supplement to IEB-79-01B requires licensees to utilize the table in Appendix C and identify any additional materials as the result of their effort.

(2) Establish an ongoing program to review surveillance and maintenance records to identify potential age-related degradations.

(3) Establish component maintenance and replacement schedules which include considerations of aging characteristics of the installed components.

The licensee identified a number of equipment items for which a specified qualified life was established (for examples, 5 years, 15 years, or 40 years). In its assessment of these submittals, the staff did not review the adequacy of the methodology nor the basis used to arrive at these values; the staff has assumed that the established values are based on state-of-the art technology and are acceptable.

For this review, however, the staff requires that the licensee submit supplemental information to verify and identify the degree of conformance to the above requirements. The response should include all the equipment identified as required to maintain functional operability in harsh environments.

The licensee indicated that this phase of the response is outstanding and that the review is in progress. The staff will review the licensee's response when it is submitted and discuss its evaluation in a supplemental report.

3.8 Radiation (Inside and Outside Containment)

The licensee has provided values for the radiation levels postulated to exist following a LOCA. The application and methodology employed to determine these values were presented to the licensee as part of the NRC staff criteria contained in the DOR guidelines, in NUREG-0588, and in the guidance provided in IEB-79-01B, Supplement 2. Therefore, for this review, the staff has assumed that, unless otherwise noted, the values provided have been determined in accordance with the prescribed criteria. The staff review determined that the values to which equipment was qualified enveloped the requirements identified by the licensee.

The value required by the licensee inside containment is an integrated dose of 1 x 108 rads. This value envelopes the DOR guideline requirements and is therefore acceptable.

A required value outside containment of 1.62 x 106 rads has been used by the licensee to specify limiting radiation levels within rooms 105 and 115 of the auxiliary building. This value appears to consider the radiation levels influenced by the source term methodology associated with post-LOCA recirculation fluid lines and is therefore acceptable.

4 QUALIFICATION OF EQUIPMENT

The following subsections present the staff's assessment, based on the licensee's submittal, of the qualification status of safety-related electrical equipment.

The staff has separated the safety-related equipment into three categories: (1) equipment requiring immediate corrective action, (2) equipment requiring additional qualification information and/or corrective action, and (3) equipment considered acceptable if the staff's concern identified in Section 3.7 is satisfactorily resolved.

In its assessment of the licensee's submittal, the NRC staff did not review the methodology employed to determine the values established by the licensee. However, in reviewing the data sheets, the staff made a determination as to the stated conditions presented by the licensee. Additionally, the staff has not completed its review of supporting documentation referenced by the licensee (for example, test reports). It is expected that when the review of test reports is complete, the environmental qualification data bank established by the staff will provide the means to cross reference each supporting document to the referencing licensee.

If supporting documents are found to be unacceptable, the licensee will be required to take additional corrective actions to either establish qualification or replace the item(s) of concern. This effort will begin in early 1981.

An appendix for each subsection of this report provides a list of equipment for which additional information and/or corrective action is required. Where appropriate, a reference is provided in the appendices to identify deficiencies. It should be noted, as in the Commission Memorandum and Order, that the deficiencies identified do not necessarily mean that equipment is unqualified. However, they are cause for concern and may require further case-by-case evaluation.

4.1 Equipment Requiring Immediate Corrective Action

Appendix A identifies equipment (if any) in this category. The licensee was asked to review the facility's safety-related electrical equipment. The licensee's review of this equipment identified an ASCO solenoid valve as requiring immediate corrective action; therefore, licensee event report (LER) 80-061 was submitted. The licensee has stated that this valve has been replaced. In this review, the staff has not identified any other safety-related electrical equipment which is not able to perform its intended safety function during the time in which it must operate.

4.2 Equipment Requiring Additional Information and/or Corrective Action

Appendix B identifies equipment in this category, including a tabulation of deficiencies. The deficiencies are noted by a letter relating to the legend (identified below), indicating that the information provided is not sufficient for the qualification parameter or condition.

Legend

R - radiation
T - temperature
QT - qualification time
RT - required time
P - pressure
H - humidity
CS - chemical spray
A - material-aging evaluation; replacement schedule; ongoing equipment surveillance
S - submergence
M - margin
I - HELB evaluation outside containment not completed
QM - qualification method
RPN - equipment relocation or replacement; adequate schedule not provided
EXN - exempted equipment justification inadequate
SEN - separate-effects qualification justification inadequate
QI - qualification information being developed
RPS - equipment relocation or replacement schedule provided

As noted in Section 4, these deficiencies do not necessarily mean that the equipment is unqualified. However, the deficiencies are cause for concern and require further case-by-case evaluation. The staff has determined that an acceptable basis to exempt equipment from qualification, in whole or part, can be established provided the following can be established and verified by the licensee:

(1) Equipment does not perform essential safety functions in the harsh environment, and equipment failure in the harsh environment will not impact safety-related functions or mislead an operator.

(2a) Equipment performs its function before its exposure to the harsh environment, and the adequacy for the time margin provided is adequately justified, and

(2b) Subsequent failure of the equipment as a result of the harsh environment does not degrade other safety functions or mislead the operator.

(3) The safety-related function can be accomplished by some other designated equipment that has been adequately qualified and satisfies the single-failure criterion.

(4) Equipment will not be subjected to a harsh environment as a result of the postulated accident.

The licensee is, therefore, required to supplement the information presented by providing resolutions to the deficiencies identified; these resolutions should include a description of the corrective action, schedules for its completion (as applicable), and so forth. The staff will review the licensee's response, when it is submitted, and discuss the resolution in a supplemental report.

It should be noted that in cases where testing is being conducted, a condition may arise which results in a determination by the licensee that the equipment does not satisfy the qualification test requirements. For that equipment, the licensee will be required to provide the proposed corrective action, on a timely basis, to ensure that qualification can be established by June 30, 1982.

4.3 Equipment Considered Acceptable or Conditionally Acceptable

Based on the staff review of the licensee's submittal, the staff identified the equipment in Appendix C as (1) acceptable on the basis that the qualification program adequately enveloped the specific environmental plant parameters, or (2) conditionally acceptable subject to the satisfactory resolution of the staff concern identified in Section 3.7.

For the equipment identified as conditionally acceptable, the staff determined that the licensee did not clearly

(1) state that an equipment material evaluation was conducted to ensure that no known materials susceptible to degradation because of aging have been used,

(2) establish an ongoing program to review the plant surveillance and maintenance records in order to identify equipment degradation which may be age related, and/or

(3) propose a maintenance program and replacement schedule for equipment identified in item 1 or equipment that is qualified for less than the life of the plant.

The licensee is, therefore, required to supplement the information presented for equipment in this category before full acceptance of this equipment can be established. The staff will review the licensee's response when it is submitted and discuss the resolution in a supplemental report.

5 DEFERRED REQUIREMENTS

IEB 79-01B, Supplement 3 has relaxed the time constraints for the submission of the information associated with cold shutdown equipment and TMI lessons-learned modifications. The staff has required that this information be provided by February 1, 1981. The staff will provide a supplemental safety evaluation addressing these concerns.

6 CONCLUSIONS

The staff has determined that the licensee's listing of safety-related systems and associated electrical equipment whose ability to function in a harsh environment following an accident is required to mitigate a LOCA or HELB is complete and acceptable, except as noted in Section 3 of this report. The staff has also determined that the environmental service conditions to be met by the electrical equipment in the harsh accident environment are appropriate, except as noted in Section 3 of this report. Outstanding information identified in Section 3 should be provided within 90 days of receipt of this SER.

The staff has reviewed the qualification of safety-related electrical equipment to the extent defined by this SER and, because the ASCO solenoid valve discussed in Section 4.1 has been replaced, the staff has found no outstanding items which would require immediate corrective action to ensure the safety of plant operation. However, the staff has determined that many items of safety-related electrical equipment identified by the licensee for this review do not have adequate documentation to ensure that they are capable of withstanding the harsh environmental service conditions. This review was based on a comparison of the qualification values with the specified environmental values required by the design, which were provided in the licensee's summary sheets.

Subsection 4.2 identified deficiencies that must be resolved to establish the qualification of the equipment; the staff requires that the information lacking in this category be provided within 90 days of receipt of this SER. Within this period, the licensee should either provide documentation of the missing qualification information which demonstrates that such equipment meets the DOR guidelines or NUREG-0588 or commit to a corrective action (requalification, replacement, relocation, and so forth) consistent with the requirements to establish qualification by June 30, 1982. If the latter option is chosen, the licensee must provide justification for operation until such corrective action is complete.

Subsection 4.3 identified acceptance and conditional acceptance based on noted deficiencies. Where additional information is required, the licensee should respond within 90 days of receipt of this SER by providing assurance that these concerns will be satisfactorily resolved by June 30, 1982.

The staff issued to the licensee Sections 3 and 4 of this report and requested, under the provisions of 10 CFR 50.54(f), that the licensee review the deficiencies enumerated and the ramifications thereof to determine whether safe operation of the facility would be impacted in consideration of the deficiencies. The licensee has completed a preliminary review of the identified deficiencies and has determined that, after due consideration of the deficiencies and their ramifications, continued safe operation would not be adversely affected.

Based on these considerations, the staff concludes that conformance with the above requirements and satisfactory completion of the corrective actions by June 30, 1982 will ensure compliance with the Commission Memorandum and Order of May 23, 1980. The staff further concludes that there is reasonable assurance of continued safe operation of this facility pending completion of these corrective actions. This conclusion is based on the following:

(1) tha, there are no outstanding items which would require immediate corrective action to assure safety of plant operation

(2) some of the items found deficient have been or are being replaced or relocated, thus improving the facility's capability to function following LOCA or HELB

(3) the harsh environmental conditions for which this equipment must be qualified result from low-probability events; events which might reasonably be anticipated during this very limited period would lead to less demanding service conditions for this equipment.

APPENDIX A

Equipment Requiring
Immediate Corrective Action
(Category 4.1)

LEGEND:

Designation for Deficiency

R - Radiation
T - Temperature
QT - Qualification time
RT - Required time
P - Pressure
H - Humidity
CS - Chemical spray
A - Material aging evaluation, replacement schedule, ongoing equipment surveillance
S - Submergence
M - Margin
I - HELB evaluation outside containment not completed
QM - Qualification method
RPN - Equipment relocation or replacement, adequate schedule not provided
EXN - Exempted equipment justification inadequate
SEN - Separate effects qualification justification inadequate
QI - Qualification information being developed
RPS - Equipment relocation or replacement schedule provided

Equipment Description	Manufacturer	Plant ID No.
Solenoid Valve	ASCO	SV5005

This valve was installed on August 26, 1976 for temporary use and was replaced in September 1980 with a nuclear-service-grade solenoid valve.

APPENDIX B

Equipment Requiring Additional Information and/or Corrective Action (Category 4.2)

LEGEND:

Designation for Deficiency

- R - Radiation
- T - Temperature
- QT - Qualification time
- RT - Required time
- P - Pressure
- H - Humidity
- CS - Chemical spray
- A - Material Aging Evaluation, Replacement Schedule, Ongoing Equipment Surveillance
- S - Submergence
- M - Margin
- I - HELB evaluation outside containment not completed
- QM - Qualification method
- RPN - Equipment relocation or replacement, adequate schedule not provided
- EXN - Exempted equipment justification inadequate
- SEN - Separate effects qualification justification inadequate
- QI - Qualification information being developed
- RPS - Equipment relocation or replacement schedule provided

Equipment Description	Manufacturer	Component No.	Deficiency
Valve Motor Operator	Limitorque	MV13280	RT,QT,T,P,H,R,A, EXN
Valve Motor Operator	Limitorque	MV13380	RT,QT,T,P,H,R,A, EXN
Valve Motor Operator	Limitorque	MV1411B	RT,QT,T,P,H,R,A, EXN
Level Transmitter	Bailey Meter	LTSP9A3	QT,CS,R,A,S,RPN, EXN
Level Transmitter	Bailey Meter	LTSP9A4	QT,CS,R,A,S,RPN, EXN
Level Transmitter	Bailey Meter	LTSP9B3	QT,CS,R,A,S,RPN, EXN

Equipment Description	Manufacturer	Component No.	Deficiency
Level Transmitter	Bailey Meter	LTSP9B4	QT,CS,R,A,S,RPN, EXN
Cooler Fan	Louis Allis (Trane)	MC0311	QT,R,A
Cooler Fan	Louis Allis (Trane)	MC0312	QT,R,A
Cooler Fan	Louis Allis (Trane)	MC0313	QT,R,A
Cooler Fan	Louis Allis (Trane)	MC0314	QT,R,A
Cooler Fan	Louis Allis (Trane)	MC0315	QT,R,A
Valve Motor Operator	Limitorque	MV54390	QT,R,A
Valve Motor Operator	Limitorque	MV54400	QT,R,A
Valve Motor Operator	Limitorque	MV54420	QT,R,A
Solenoid Valve	ASCO	SV5715	QT,R,A,QI,RPS
Valve Motor Operator	Limitorque	MV05990	RT,QT,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV06010	RT,QT,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV06080	RT,QT,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV06120	RT,QT,P,H,R,A,EXN
Solenoid Valve	ASCO	SV375	QT,T,P,H,A,QI,RPS, EXN
Solenoid Valve	ASCO	SV394	QT,T,P,H,A,QI,RPS, EXN
Solenoid Valve	ASCO	SVICS11A1	QT,T,P,H,A,QI,RPS, EXN
Solenoid Valve	ASCO	SVICS11A2	QT,T,P,H,A,Q ,RPS, EXN
Solenoid Valve	ASCO	SVICS11B1	QT,T,P,H,A,QI,RPS, EXN
Solenoid Valve	ASCO	SVIC11B2	QT,T,P,H,A,QI,RPS, EXN

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	SV598	RT,QT,T,P,H,R,A,QI, RPS,EXN
Solenoid Valve	ASCO	SV607	RT,QT,T,P,H,R,A,QI, RPS,EXN
Blind Transmitter	Rosemount	FTDH2A	QT,T,P,H,A,EXN
Blind Transmitter	Rosemount	FTDH2B	QT,A,EXN
Decay Heat Pump	Westinghouse	MP0421	QT,R,A
Decay Heat Pump	Westinghouse	MP0422	QT,R,A
Valve Motor Operator	Limitorque	MV08300	QT,R,A,EXN
Valve Motor Operator	Limitorque	MV08310	QT,R,A,EXN
Valve Motor Operator	Limitorque	MV27330	QT,R,A,EXN
Valve Motor Operator	Limitorque	MV27340	QT,R,A,EXN
Valve Motor Operator	Limitorque	MVDH01A	QT,T,P,H,A
Valve Motor Operator	Limitorque	MVDH01B	QT,A
Valve Motor Operator	Limitorque	MVDH63	QT,R,A,EXN
Valve Motor Operator	Limitorque	MVDH64	QT,R,A,EXN
Solenoid Valve	ASCO	SV1467	QT,R,A,EXN,QI,RPS
Solenoid Valve	ASCO	SV1469	QT,R,A,EXN,QI,RPS
Solenoid Valve	ASCO	SVDH13A	QT,R,A,EXN,QI,RPS
Solenoid Valve	ASCO	SVDH13B	QT,R,A,EXN,QI,RPS
Solenoid Valve	ASCO	SVDH14A	QT,R,A,EXN,QI,RPS
Solenoid Valve	ASCO	SVDH14B	QT,R,A,EXN,QI,RPS
HPI Pump	Westinghouse	MP0581	QT,R,A
HPI Pump	Westinghouse	MP0582	QT,R,A

Equipment Description	Manufacturer	Component No.	Deficiency
Valve Motor Operator	Limitorque	MVHP02A	QT,T,P,H,A
Valve Motor Operator	Limitorque	MVHP02B	QT,T,P,H,A
Valve Motor Operator	Limitorque	MVHP02C	QT,A
Valve Motor Operator	Limitorque	MVHP02D	QT,A
Containment Spray Pump	General Dynamic	MP0561	QT,R,A
Containment Spray Pump	General Dynamic	MP0562	QT,R,A
Valve Motor Operator	Limitorque	MV15300	QT,T,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV15310	QT,T,P,H,R,A,EXN
Recirculation Fan (Motor)	Joy (Reliance)	MV00561	CS,A
Recirculation Fan (Motor)	Joy (Reliance)	M00562	CS,A
Blower Fan	Westinghouse	M00622	QT,R,A
Valve Motor Operator	Limitorque	MV50370	QT,T,P,H,R,A
Valve Motor Operator	Limitorque	MV50380	QT,T,P,H,R,A
Valve Motor Operator	Limitorque	MV50650	QT,R,A
Valve Motor Operator	Limitorque	MV50900	QT,T,P,H,R,A
Valve Motor Operator	Limitorque	MV50670	QT,T,P,H,R,A
Blower Fan	Westinghouse	M00621	QT,T,P,H,R,A
Valve Motor Operator	Limitorque	MV0240A	QT,CS,A
Valve Motor Operator	Limitorque	MV1407B	RT,QT,T,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV1411A	RT,CS,A
Valve Motor Operator	Limitorque	MV1567A	RT,CS,A
Valve Motor Operator	Limitorque	MV1407A	RT,CS,A
Valve Motor Operator	Limitorque	MV27350	QT,CS,A

Equipment Description	Manufacturer	Component No.	Deficiency
Valve Motor Operator	Limitorque	MV5010A	QT,CS,A
Valve Motor Operator	Limitorque	MV5010C	QT,CS,A
Valve Motor Operator	Limitorque	MV5011B	QT,CS,A
Valve Motor Operator	Limitorque	MV5011D	QT,CS,A
Valve Motor Operator	Limitorque	MV50700	QT,A
Valve Motor Operator	Limitorque	MV50710	QT,A
Valve Motor Operator	Limitorque	MV50720	QT,A
Valve Motor Operator	Limitorque	MV50730	QT,A
Valve Motor Operator	Limitorque	MV50740	QT,A
Valve Motor Operator	Limitorque	MV50750	QT,A
Valve Motor Operator	Limitorque	MV50760	QT,A
Valve Motor Operator	Limitorque	MVMU59A	RT,CS,A,S,EXN
Valve Motor Operator	Limitorque	MVMU59B	RT,CS,A,S,EXN
Valve Motor Operator	Limitorque	MVMU59C	RT,CS,A,S,EXN
Valve Motor Operator	Limitorque	MVMU59D	RT,CS,A,S,EXN
Solenoid Valve	ASCO	SV1719A	RT,QT,T,P,H,CS,R,A, QI,EXN,RPS
Solenoid Valve	ASCO	SV1773A	RT,QT,T,P,H,CS,R,A, S,QI,EXN,RPS
Solenoid Valve	ASCO	SV229B	RT,QT,T,P,H,CS,R,A, S,QI,EXN,RPS
Solenoid Valve	ASCO	SV235B	RT,QT,T,P,H,CS,R,A, QI,EXN,RPS
Solenoid Valve	ASCO	SV500E	RT,QT,T,P,H,CS,R,A, QI,M,EXN,RPS
Solenoid Valve	ASCO	SV5007	RT,QT,T,P,H,CS,R,A, QI,M,EXN,RPS

Equipment Description	Manufacturer	Component No.	Deficiency
Valve Motor Operator	Limitorque	MV5011A	QT,T,P,H,R,A
Valve Motor Operator	Limitorque	MV0240B	QT,T,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV20000	QT,T,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV20030	QT,T,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV2012B	RT,QT,T,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV5010B	QT,T,P,H,R,A
Valve Motor Operator	Limitorque	MV5010D	QT,T,P,H,R,A
Valve Motor Operator	Limitorque	MV5010E	QT,T,P,H,R,A
Valve Motor Operator	Limitorque	MV5011E	QT,T,P,H,R,A
Solenoid Valve	ASCO	SV6831B	RT,QT,R,A,EXN,QI,RPS
Solenoid Valve	ASCO	SV1542	RT,QT,T,P,H,R,A,QI, EXN,RPS
Solenoid Valve	ASCO	SV1544	RT,QT,T,P,H,R,A,QI, EXN,RPS
Solenoid Valve	ASCO	SV1545	RT,QT,T,P,H,R,A,QI, EXN,RPS
Solenoid Valve	ASCO	SV1719B	RT,QT,T,P,H,R,A,QI, EXN,RPS
Solenoid Valve	ASCO	SV2010	RT,QT,T,P,H,R,A,QI, EXN,RPS
Solenoid Valve	ASCO	SV2011	RT,QT,T,P,H,R,A,QI, EXN,RPS
Solenoid Valve	ASCO	SV232	RT,QT,T,P,H,R,A,QI, EXN,RPS
Solenoid Valve	ASCO	SV235A	RT,QT,T,P,H,R,A,QI, EXN,RPS
Solenoid Valve	ASCO	SV236	RT,QT,T,P,H,R,A,QI, EXN,RPS

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	SVMU33	RT,QT,T,P,H,R,A,QI, EXN,RPS
Solenoid Valve	ASCO	SVMU03	QT,R,A,QI,EXN,RPS
Valve Motor Operator	Limitorque	MV2012A	RT,CS,A,S,EXN
Cooler Fan	Joy (Reliance)	MC0011	CS,A
Cooler Fan	Joy (Reliance)	MC0012	CS,A
Cooler Fan	Joy (Reliance)	MC0013	CS,A
Valve Motor Operator	Limitorque	MV13660	RT,QT,T,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV13670	RT,QT,T,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV13680	RT,QT,T,P,H,R,A,EXN
Solenoid Valve	ASCO	SV1356A	RT,QT,T,P,H,R,A,EXN, RPS
Solenoid Valve	ASCO	SV1356B	RT,QT,T,P,H,R,A,EXN, RPS
Solenoid Valve	ASCO	SV1357A	RT,QT,T,P,H,R,A,EXN, RPS
Solenoid Valve	ASCO	SV1357B	RT,QT,T,P,H,R,A,EXN, RPS
Solenoid Valve	ASCO	SV1358A	RT,QT,T,P,H,R,A,EXN, RPS
Solenoid Valve	ASCO	SV1358B	RT,QT,T,P,H,R,A,EXN, RPS
Pressure Transmitter	Rosemount	PTRC2A1	RT,QT,CS,R,A,EXN
Pressure Transmitter	Rosemount	PTRC2A2	RT,QT,CS,R,A,EXN
Pressure Transmitter	Rosemount	PTRC2B1	RT,QT,CS,R,A,EXN
Pressure Transmitter	Rosemount	PTRC2B2	RT,QT,CS,R,A,EXN
RTD	Rosemount	TERC3A2	QT,CS,A

Equipment Description	Manufacturer	Component No.	Deficiency
RTD	Rosemount	TERC3A4	QT,CS,A
RTD	Rosemount	TERC3B2	QT,CS,A
RTD	Rosemount	TERC3B4	QT,CS,A
*Pressure Transmitter	Foxboro	PT2000	QT,A
*Pressure Transmitter	Foxboro	PTRC2A3	RT,QT,CS,R,A
*Pressure Transmitter	Foxboro	PTRC2A4	RT,QT,CS,R,A
*Pressure Transmitter	Foxboro	PTRC2B3	RT,QT,CS,R,A
*Pressure Transmitter	Foxboro	PTRC2B4	RT,QT,CS,R,A
*Pressure Transmitter	Foxboro	PT2003	QT,A
Terminal Block	Formweld/Stanwick	EV27330	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV54390	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV54400	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EVDH64	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV1467	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV1469	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV08300	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV08310	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV27340	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EVDH63	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV54420	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV50650	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EVMU03	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EVDH01B	QT,R,A,QI

*See Attachment 1: Foxboro letter (3/12/81), "Potential Deficiency Affecting Foxboro Transmitters," for corrective action.

Equipment Description	Manufacturer	Component No.	Deficiency
Terminal Block	Formweld/Stanwick	EVHP02C	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EVHP02D	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV1719B	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV50370	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV50380	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV2012B	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EVDH01A	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EVHP02A	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EVHP02B	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EVMU3?	QT,R,A,QI
Terminal Block	Formweld/Stanwick	EV06180	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV06120	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV15300	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV1544	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV20000	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV607	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV0240B	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV06010	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV05990	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV1407B	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV1545	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV1567B	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV2010	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV2011	QT,T,P,H,R,A,QI

Equipment Description	Manufacturer	Component No.	Deficiency
Terminal Block	Formweld/Stanwick	EV5010B	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV5010D	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV13660	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV13670	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV15310	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV20030	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV27360	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV50670	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV50900	QT,T,P,H,R,A,QI
Terminal Block	Formweld/Stanwick	EV101B	QT,T,P,H,A,QI
Terminal Block	Formweld/Stanwick	EV1011	QT,T,P,H,A,QI
Terminal Block	Formweld/Stanwick	JT6801	QT,T,P,
Terminal Block	Formweld/Stanwick	JT6802	QT,T,P,H,A,QI
Terminal Block	Formweld/Stanwick	JT6807	QT,T,P,H,A,QI
Terminal Block	Formweld/Stanwick	EV100A	QT,T,P,H,A,QI
Terminal Block	Formweld/Stanwick	EV1001	QT,T,P,H,A,QI
Terminal Block	Formweld/Stanwick	JT6703	QT,T,P,H,A,QI
Terminal Block	Formweld/Stanwick	JT6704	QT,T,P,H,A,QI
Terminal Block	Formweld/Stanwick	JT6707	QT,T,P,H,A,QI
Terminal Block	Formweld/Stanwick	JT2917	QT,CS,A
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NC0314	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NC0315	QT,R,A,QI

Equipment Description	Manufacturer	Component No.	Deficiency
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NP0561	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NP0581	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV27330	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV54390	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVDH64	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV54400	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1467	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1469	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV08300	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV08310	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV27340	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVDH13A	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVDH13B	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVDH14A	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVDH14B	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NC0313	QT,R,A,QI

Equipment Description	Manufacturer	Component No.	Deficiency
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NC0311	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NC0312	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NP0562	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NP0582	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV54420	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVDH63	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVDH01B	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVHP02C	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVHP02D	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NC0622	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV6831B	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV50650	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVMU03	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1719B	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV2012B	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV13830	QT,R,A,QI

Equipment Description	Manufacturer	Component No.	Deficiency
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV232	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV236	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1541	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV50370	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV50380	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVDH01A	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVHP02A	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVHP02B	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVMU33	QT,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV06080A	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV06080B	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV06120	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV15300	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV5011A	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV50300	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1544	QT,T,P,H,R,A,QI

Equipment Description	Manufacturer	Component No.	Deficiency
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV20000	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NCDE11C	QT,T,P,H,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV05990A	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV05990B	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV06010	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV235A	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NC0621	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV15310	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV598	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV607	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV50670	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV50900	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1356	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1357	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1358	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1358A	QT,T,P,H,R,A,QI

Equipment Description	Manufacturer	Component No.	Deficiency
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1358B	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV13660	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV13670	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV13680A	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV13680B	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV50290	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV5010B	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV5010D	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV5010E	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV5011E	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV2011	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1407B	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1411B	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1542	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1545	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1567B	QT,T,P,H,R,A,QI

Equipment Description	Manufacturer	Component No.	Deficiency
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV0240B	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV20030	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV2010	QT,T,P,H,R,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1011	QT,T,P,H,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV394	QT,T,P,H,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVICS11B	QT,T,P,H,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV1001	QT,T,P,H,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NV375	QT,T,P,H,A,QI
Push Button Switch	Mackworth Rees/ Crouse-Hinds Co.	NVICS11A	QT,T,P,H,A,QI
Terminal Block	States	CDE11D	QT,R,A,QI
Terminal Block	States	CDF11D	QT,R,A,QI
Terminal Block	States	RC2701	QT,R,A,QI
Terminal Block	States	CDF11C	QT,T,P,H,R,A,QI
Terminal Block	States	RC3801	QT,T,P,H,A,QI
Terminal Block	States	CDE11A	QT,T,P,H,A,QI
Terminal Block	States	CDE11B-1	QT,T,P,H,A,QI
Terminal Block	States	CDE11B-2	QT,T,P,H,A,QI
Terminal Block	States	CDE11C	QT,T,P,H,A,QI
Terminal Block	States	CDYE2	QT,T,P,H,A,QI

Equipment Description	Manufacturer	Component No.	Deficiency
Terminal Block	States	RC3706	QT,T,P,H,A,QI
Terminal Block	States	RC3703	QT,T,P,H,R,A,QI
Terminal Block	States	RC3704	QT,T,P,H,R,A,QI
Terminal Block	States	RC3701	QT,T,P,H,R,A,QI
Terminal Block	States	RC3705	QT,T,P,H,R,A,QI
Terminal Block	States	RC3702	QT,T,P,H,R,A,QI
Penetration Terminal Block Box/Connector	Formweld Buchanan Amphenol	P1L1LX	QT,T,P,H,R,A,QI
Penetration Terminal Block Box/Connector	Formweld Buchanan Amphenol	P1C2LX	QT,T,P,H,R,A,QI
Penetration Terminal Block Box/Connector	Formweld Buchanan Amphenol	P1P2MX	QT,T,P,H,R,A,QI
Penetration Terminal Block Box	Formweld Buchanan	P1P3BX	QT,T,P,H,R,A,QI
Penetration Terminal Block Box	Formweld Buchanan	P4L1GX	QT,T,P,H,R,A,QI
Penetration Box	Formweld Amphenol	P1L1LI	QT,CS,A
Penetration Box	Formweld Amphenol	P1C2LI	QT,CS,A
Penetration Box	Formweld Amphenol	P1P2MI	QT,CS,A
Penetration Box	Formweld Amphenol	P1P3BI	QT,CS,A
Penetration Box	Formweld Amphenol	P2L4GI	QT,CS,A
Penetration Box	Formweld Amphenol	P2C5GI	QT,CS,A
Penetration Box	Formweld Amphenol	P2P5FI	QT,CS,A
Penetration Box	Formweld Amphenol	P3P4CI	QT,CS,A
Penetration Box	Formweld Amphenol	P3L4SI	QT,CS,A
Penetration Box	Formweld Amphenol	P4L1GI	QT,CS,A
Penetration	Amphenol	P1L1L	CS,A,M,QI

Equipment Description	Manufacturer	Component No.	Deficiency
Penetration	Amphenol	P1C2L	CS,A,M,QI
Penetration	Amphenol	P1P2M	CS,A,M,QI
Penetration	Amphenol	P1P3B	CS,A,M,QI
Penetration	Amphenol	P2L4G	CS,A,M,QI
Penetration	Amphenol	P2C5G	CS,A,M,QI
Penetration	Amphenol	P2P5F	CS,A,M,QI
Penetration	Aphenol	P3L4S	CS,A,M,QI
Penetration	Amphenol	P3P4C	CS,A,M,QI
Penetration	Amphenol	P4L1G	CS,A,M,QI
Motor Control Center	Westinghouse	BE11A	QT,R,A,QI
Motor Control Center	Westinghouse	BE11D	QT,R,A,QI
Motor Control Center	Westinghouse	BF11D	QT,R,A,QI
Motor Control Center	Westinghouse	BF11C	QT,T,P,H,R,A,QI
Motor Control Center	Westinghouse	BE11B	QT,T,P,H,A,QI
Motor Control Center	Westinghouse	BE11C	QT,T,P,H,A,QI
Motor Control Center	Westinghouse	BYE2	QT,T,P,H,A,QI
Cable	Boston Insulated Wire	L1P	QT,CS,A,M,S
Cable	Boston Insulated Wire	L1Q	QT,CS,A,M,S
Cable	Boston Insulated Wire	L1T	QT,CS,A,MS
Cable	Boston Insulated Wire	L4P	QT,CS,A,M,S
Cable	Boston Insulated Wire	LXP	QT,CS,A,M,S
Cable	Okonite	B10	QT,CS,A,S

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Cable	Okonite	C20	QT,CS,A,S
Cable	Okonite	AG1	QT,CS,A,S
Cable	Okonite	AG2	QT,CS,A,S
Cable	Kerite	B01	QT,CS,A,M,S
Cable	Kerite	B02	QT,CS,A,M,S,
Cable	Kerite	B04	QT,CS,A,M,S
Cable	Kerite	B06	QT,CS,A,M,S,
Cable	Kerite	B07	QT,CS,A,M,S
Cable	Kerite	B11	QT,CS,A,M,S,
Cable	Kerite	BG1	QT,CS,A,M,S
Cable	Kerite	BG2	QT,CS,A,M,S,
Cable	Kerite	BG3	QT,CS,A,M,S
Cable	Kerite	BG4	QT,CS,A,M,S,
Cable	Kerite	BG5	QT,CS,A,M,S
Cable	Kerite	BG6	QT,CS,A,M,S,
Cable	Kerite	C01	QT,CS,A,M,S
Cable	Kerite	C02	QT,CS,A,M,S,
Cable	Kerite	C10	QT,CS,A,M,S
Cable	Kerite	C11	QT,CS,A,M,S,
Cable	Kerite	C12	QT,CS,A,M,S
Cable	Kerite	C13	QT,CS,A,M,S,
Cable	Kerite	C14	QT,CS,A,M,S
Cable	Kerite	C15	QT,CS,A,M,S,

Equipment Description	Manufacturer	Component No.	Deficiency
Cable	Kerite	C20	QT,CS,A,M,S
Cable	Kerite	C21	QT,CS,A,M,S,
Cable	Kerite	C22	QT,CS,A,M,S
Cable	Kerite	C23	QT,CS,A,M,S,
Cable	Kerite	C24	QT,CS,A,M,S
Cable	Kerite	C25	QT,CS,A,M,S,
Cable	Kerite	C51	QT,CS,A,M,S
Cable	Kerite	C52	QT,CS,A,M,S,
Cable	Kerite	C53	QT,CS,A,M,S
Cable	Kerite	C55	QT,CS,A,M,S,
Cable	Kerite	C56	QT,CS,A,M,S
Splice Kit	Raychem	Inside Containment	QT,CS,A
Terminal Block	Formweld Stanwick	JT2317	QT,T,P,H,R,A,QI
Pressure Controller	GE	PDC5000	QT,T,P,H,R,A,QI,RPS
*Pressure Transmitter	Foxboro	PDT5000	QT,T,P,H,R,A
Pressure Relay	GE	PDY5000A	QT,T,P,H,R,A,QI,RPS
Pressure Relay	GE	PDY5000B	QT,T,P,H,R,A,QI,RPS
Pressure Relay	Foxboro	PDY5000C	QT,T,P,H,R,A,QI,RPS
Pressure Switch	Static-O-Ring	PSH5030	QT,T,P,H,R,A
Radiation Transmitter	Victoreen	RE5030	QT,T,P,H,R,A,EXN
Pressure Switch	Static-O-Ring	PSH5029	QT,T,P,H,R,A

*See Attachment 1: Foxboro letter (3/12/81), "Potential Deficiency Affecting Foxboro Transmitters," for corrective action.

Equipment Description	Manufacturer	Component No.	Deficiency
Radiation Transmitter	Victoreen	RE5029	QT,T,P,H,R,A,EXN
Valve Motor Operator	Limitorque	MV50770	RT,A
Valve Motor Operator	Limitorque	MV50780	RT,A
Valve Motor Operator	Limitorque	MV50790	RT,A

APPENDIX C

Equipment Considered Acceptable Or Conditionally Acceptable

(Category 4.3)

Equipment Description	Manufacturer	Plant ID. No.	Deficiency
Solenoid Valve	ASCO	SV1001	A
Solenoid Valve	ASCO	SV1011	A
Valve Motor Operator	Limitorque	MVDH110	A
Valve Motor Operator	Limitorque	MVDH120	A

APPENDIX D

Safety-Related Systems List[1]

Function	System
Emergency Reactor Shutdown	Reactor Coolant Reactor Protection Safety Features Actuation Reactor Coolant Letdown Reactor Coolant Makeup
Containment Isolation	Steam Generator Isolation Decay Heat Removal Reactor Coolant Letdown Reactor Coolant Makeup Containment Gas Analyzer Component Cooling Water Core Flooding Reactor Coolant Pump Seal Return Valves Containment Isolation[2]
Reactor Core Cooling	High Pressure Injection Low Pressure Injection Core Flooding
Containment Heat Removal	Containment Air Cooling Emergency Ventilation Containment Spray Containment Sump Recirculation
Core Residual Heat Removal	Decay Heat Removal Pressurizer Spray

[1] The NRC staff recognized that there are differences in nomenclature of systems because of plant vintage and engineering designs; consequently, some systems performing identical or similar functions may have different names. In those instances it was necessary to verify the system(s) function with the responsible IE regional reviewer and/or the Licensee.

[2] Includes isolation valves in systems not given above.

Function	System
Core Residual Heat Removal	Power Operated Relief Valves[3] Main Feedwater Auxiliary Feedwater Main Steam Component Cooling Water Service Water
Prevention of Significant Release of Radioactive Material to Environment	Containment Spray (Iodine Removal) Hydrogen Dilution-Containment Gas Analyzer Containment Radiation Monitoring Containment Radiation Sampling[3]
Supporting Systems	Emergency Diesel Generator and Support Systems Emergency Core Cooling System Pump Room HVAC IE Switchgear Room HVAC Control Room HVAC

[3]Covered as part of TMI-2 Lessons Learned

ATTACHMENT 1

The Foxboro Company

Foxboro, MA 02035 U.S.A.
(617) 543-8750

12 March 1981

Subject: Potential Deficiency Affecting Foxboro Transmitters, Model Numbers N-E11, N-E13 or E11, E13 with suffix Codes /MCA, /MCA/RRW, or /MCA/RR

Gentlemen:

Our records indicate that you have received one or more of the Foxboro model numbered transmitters listed above. This letter is to notify you that two deficiencies have been discovered in some of these transmitters which may exist in the units shipped to you. The transmitters in question operate at a signal level of 10-50mA. Similar model numbered units operating at 4-20mA are not affected.

The first issue involves the possible use of incorrect insulating sleeving on transistor and zener diode lead wires in the amplifier. The second issue involves the use of a specific vendor's capacitor which is not hermetically sealed (although claimed to be so). As a result, the capacitor electrolyte can leak under adverse service conditions, specifically heat and time. The failure mode is a decrease in resistance across the capacitor resulting in electrical leakage. The transmitter operation can be affected by limiting the output to something less than full value which, in time, can degrade to no output at all.

Insulating Sleeving - Radiation resistant sleeving consisting of a silicone coated glass fiber braid has been substituted by a teflon sleeving in some transmitters. Tests have shown that teflon will become brittle and deteriorate with a substantial integrated radiation dose. Foxboro testing has demonstrated that the teflon sleeving used in these devices will withstand an integrated dose of 10 megarads with no noticeable deterioration. Tests to 200 megarads produce the brittle conditions which can result in the teflon flaking from the wires. Based on these tests, operating plants not expected to exceed an integrated dose of 10 megarads have no potential problem and no action is required.

Where the integrated dose rate could exceed 10 megarads, then units in service should be inspected to determine if the proper insulating material has been used. This can be accomplished by opening the transmitter in accordance with Foxboro Master Instruction MI 20-145. The amplifier cover must be removed exposing the amplifier assembly. At one end of the assembly, a transistor and a zener diode are mounted in the base casting which serves as a heat sink. The insulating material in question is a sleeving slipped over the lead wires from these two components. The proper material is white and heavy looking. Positive

FOXBORO

Subject:

identification can be made by inspecting one end of the material to establish that the outer material covers an inner braid. Teflon, if used, will be a single layer material and could be either clear or white.

If improper insulation is present, then the corrective action is to replace the amplifier (Foxboro P/N N0148PW). Replacement amplifiers can be purchased from your local Foxboro Sales or Service Representatives. If you prefer to have Foxboro Service Personnel inspect the equipment and, if necessary, replace the amplifier, this can be arranged at standard service rates.

Capacitor - The capacitor degradation problem was discovered over time through tracking failure situations. Internal corrective action has been taken to remove the vendor involved from the qualified vendor list and to purge all stock of capacitors from this vendor. Degradation of this capacitor is a function of time and service conditions with heat being a primary contributor. This phenomenon was observed in recent tests of transmitters using these capacitors. The capacitor in question is manufactured by Cornell-Duebilier and can be specifically identified by a type number in the form TX-65-XXXX as well as a monogram in a box followed by a date code, e.g. CDE 0874 . It is assigned Foxboro part number N0141MF.

To determine if this capacitor is present requires a visual inspection of the amplifier which can be accomplished as described above for the insulating sleeving inspection. The recommended corrective action should the above described capacitor be present is to replace the amplifier (Foxboro P/N N0148PW) although is is possible to replace the capacitor with a Foxboro provided substitute. Use of Foxboro Service personnel to perform the inspection and replacement, if necessary, can be arranged at standard service rates as described above.

Due to lack of knowledge of specific application, redundancy, and the like, Foxboro cannot determine if the NRC reporting requirements of 10CFR Part 21 are applicable. This determination is the responsibility of the user and any such reporting would be made by them after completing their evaluation of the situation.

If you have any questions regarding the above, please contact the undersigned directly.

Very truly yours,

THE FOXBORO COMPANY

W Calder

William Calder, Manager
Corporate Quality Assurance

joy
120381

Enclosure MI 20-145

FOXBORO

Enclosure 2

ENVIRONMENTAL QUALIFICATION OF SAFETY-RELATED ELECTRICAL EQUIPMENT IEB 79-01B

TECHNICAL EVALUATION REPORT

DOCKET NO. 50-346

DATED: November 21, 1980

Licensee: Toledo Edison Company
Type Reactor: B&W PWR
Plant: Davis-Besse

Prepared by F. J. Jablonski
Engineering Support Section
Reactor Construction and Engineering
Support Branch, RIII

CONTENTS

Introduction

This report is submitted in accordance with TI 2515/41[1/] for use as input to the Safety Evaluation Report on qualification of Class 1E electrical equipment installed in potentially "harsh" environmental areas at this facility.

Background and Discussion

IE Bulletin No. 79-01[2/] required the licensee to perform a detailed review of the environmental qualification of Class 1E equipment to ensure that the equipment would function under (i.e. during and following) postulated accident conditions.

The Technical Evaluation Report (TER) is based on IE's review of the licensee's submittal for conformance with the DOR guidelines or NUREG-0588, a site inspection of selected system components, to verify accuracy of the submittal, and EQB's review of component test reports.[3/]

Licensee submittals were received on April 3, 1980, August 14, 1980, and October 31, 1980.

The site inspection was completed on May 5, 1980.[4/] Generic and site specific guidance was requested from IE/NRR headquarters.[5/]

Summary of Licensee Actions/Statements

Licensee states the underlying basis for Toledo Edison's responses to this Bulletin is to bring the plant to, and maintain the plant in, a safe shutdown condition following the loss of coolant accident (LOCA) or a high energy line break, using equipment that is qualified to perform its safety related function in any harsh environment that may result; this approach is in full compliance with the operating license for Davis-Besse Unit 1, the NRC's staff safety evaluation (NUREG 0136) providing the basis of the operating license and is consistent with the required modes of operation of accident mitigating systems as described in the Final Safety Analysis Report (FSAR).

Licensee further states Toledo Edison intends to respond to Supplements 2 and 3 of the Bulletin by February 1, 1981; this response complies fully with IE Bulletin No. 79-01B as amended by Supplement 1, and meets the

1/ Technical Evaluation Report (TER) On Results Of Staff Actions Taken To Verify Reactor Licensee Response To IEB 79-01B And Supplemental Information.
2/ Environmental Qualification of Class 1E Equipment.
3/ Attachment 1.
4/ Attachment 2.
5/ Attachements 3a and 3b.

requirements of the August 29, 1980 Order for Modification of Operating License NPF-3 as revised on September 19, 1980.

System Comparison

A comparison was made between the systems list provided by the licensee[6] and a similar list provided to IE by NRR[7] during a meeting in Bethesda, MD on September 30, 1980. The following systems were not included in the licensee's submittal.

- Feedwater Control
- Residual Heat Removal
- Chemical and Volume Control
- Pressurizer Spray
- Power Operated Relief Valves
- Steam Dump
- Containment Radiation/Sampling
- Containment Sump
- Control Room Habitability
- Reactor Coolant

NOTE: Systems not on NRR's list include BWST, Rx. Clnt. Pp. Seal Return Vvs., Stm.-FW Rupture Control.

Equipment Evaluation

Class 1E equipment was evaluated, that is, placed into five separate categories.[8] Result of the evaluation follows: (See pages following)

Caveat

Test reports and other documentation which licensees referenced as establishing environmental qualification were reviewed for acceptability by NRR, Environmental Qualification Branch. (Reference Attachment 3a, memorandum dated June 20, 1980 Hayes to Jordan.)

This TER does not include information about seismic of fire withstand capability. It should therefore not be inferred that Category I equipment meets all necessary qualification requirements.

Conclusion

Based on IE's review of the licensee's submittal, the site inspection, and licensee's proposed actions, it cannot be concluded that there is reasonable assurance all components installed at the Davis-Besse Nuclear Power Plant are environmentally qualified and installation methods of environmentally

6/ Attachment 4.
7/ Attachment 5.
8/ Attachment 6.

qualified components would not contribute to the failure of such components during a potential accident.

Due to the inordinate number of components classified "IVb", that is, records search still in progress, this reviewer finds that the licensee did not submit information which fully and completely responded to the staff's request as stated in the "Order for Modification of License," NPF-3, dated September 19, 1980.

A positive conclusion cannot be made until:

1. All matters referred to IEHQS/NRR have been satisfied.9/

2. The 10 systems missing from the licensee's submittal have been evaluated by NRR. (Page 2)

3. The negative equipment evaluations have been reviewed by NRR. (Pages 4, 5, 6, and 8.)

9/ Attachment 8.

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATTI REF	CONCUR? [1]
Ia 40-41	MOV	Limitorque	SMB-3	L.P. Inj	AUX	15days/1yr *	—	—	—	—	2×10^8	40yr	25	NO-A,C,I*
Ia 52-53	MOV	Limitorque	SMB-00-15	H.P. Inj	AUX	15days/1yr *	—	—	—	—	2×10^8	40yr	25	No-A,I*
Ia 60-61	Fan/Motor	Joy/Reliance	25-17-3500/ 1YF.281548	H_2 Dilution	CNT	11days/1yr *	300	94.7	100	H_3BO_3 NaOH	1×10^9	40yr	21	No-A,I*
Ia 64	MOV	Limitorque	SMB-000	Cnt. Iso.	CNT	30days/1yr *	300	68	100	H_3BO_3 NaOH	2×10^8	40yr	24	No-A,I*
Ia 72-73	MOV	Limitorque	SMB-00-10	Cnt. Iso.	CNT	30days	340	119.7	100	H_3BO_3 NaOH	2×10^8	40yr	20,24	Yes-A
Ia 74	MOV	Limitorque	SMB-000-2	Cnt. Iso.	CNT	30days/1yr *	340	119.7	100	H_3BO_3 NaOH	2×10^8	40yr	20,24	No-A,C,I*
Ia 75-76	MOV	Limitorque	SMB-000-2	Cnt. Iso.	CNT	4hrs/1yr *	340	119.7	100	H_3BO_3 NaOH	2×10^8	40yr	20,24	No-A,C,I*
Ia 84-85	MOV	Limitorque	SMB-000-5	Cnt. Iso	Annulus	30days/1yr *	340	119.7	100	—	2×10^9	40yr	2024	No-A,C,I*
Ia 86-88	MOV	Limitorque	SMB-000-5	Cnt. Iso	Annulus	30days	340	119.7	100	—	2×10^8	40yr	20,24	Yes-A,C
Ia 89-90	MOV	Limitorque	SMB-3-150	Cnt. Iso.	CNT	6days/1yr * *	330	104.7	100	Not exposed	2×10^8	40yr	22,23	No-A,C,I* L*
Ia 91	MOV	Limitorque	SMB-00-10	Cnt. Iso	CNT	6days/1yr * *	330	104.7	100	H_3BO_3	2×10^8	40yr	22,23	No-A,C,I* L*
Ia 92-93	MOV	Limitorque	SMB-000-2	Cnt. Iso. (-) Flood	CNT	6days	330	104.7	100	H_3BO_3	2×10^8	40yr	2223	No-A,C, M
Ia 123	MOV	Limitorque	SMB-00-10	Cnt. Iso. (-) Flood	CNT	30days	340	119.7	100	H_3BO_3	2×10^8	40yr	20,24	No-A,C, M
Ia 124-126	Fan/Motor	Joy/Reliance	GF16187/ 600276-17	Cnt. Air Clr.	CNT	11days/1yr *	300	94.7	100	H_3BO_3 NaOH	1×10^9	40yr ■	21	No-A,I,■
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

[1] Attachment 9

■ "Simulated"

Davis-Besse

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATT'S REF'D	CONCUR? [10]
Ia 15	Terminal Block	Stanwick •	G	Splice?	CNT	120days/1yr *	360	84.7	100	H_3BO_3	2×10^8	40yr	7	No-A,I*
Ia 17	Penetration Box	Amphenol •	AN52975	Splice	CNT	120days/1yr *	360	61.7	100	H_3BO_3	2×10^8	40yr	7	No-A,I*
Ia 18	Cable, Inst.	BIW	—	(→flood	CNT	30days/1yr *	290	59.7	100	H_3BO_3	1×10^8	40yr	4	No-A,I*M
Ia 184	Cable, Cmt.	Okonite	—	(→flood	CNT	130days/1yr *	346	127.7	100	H_3BO_3 $NaOH$	2×10^8	40yr	1	No-A,I*M
Ia 18	Cable, Power	Okonite	—	(→flood	CNT	7days/1yr *	324	94.7	100	H_3BO_3 $NaOH$	2×10^8	40yr	2	No-A,I*M
Ia 186	Cable, Power/Cont	Kerite	—	(→flood	CNT	196hrs/1yr *	320	96.7	100	H_3BO_3 $NaOH$	1×10^8	40yr	3	No-A,I*M
Ia 191	Splice Kit	Raychem	WCSFN	—	CNT	120days/1yr *	360	84.7	100	H_3BO_3 $NaOH$	2×10^8	40yr	7	No-A,I*
Ib	None (See CAT IVb)													
IIa	None													
IIb	None													
III	None													
IVa (188) (50-153)	Terminal Block	Stanwick	G	Worst case Parameters	AUX	1yr	220	18	100	—	1.97×10^6	40yr	—	Yes-J,O
IVa 160-169	Push Button	Blackworth-Roose	FD	Worst case Parameters	AUX	1yr	201.7	17.8	100	—	1.97×10^6	40yr	—	Yes-J,O
IVa 175	Penet. (Block/Conn) Termination	Buchanan/Amphenol	TB: 0211/0721 Conn: AN52475	INST/Control	AUX	1yr	221	17.9	100	-	1.6×10^6	40yr	—	Yes-J,O
IVa 176	Term. Block	Buchanan	0211/0721	Power/Inst	AUX	1yr	228	20.13	100	—	1×10^6	40yr	—	Yes-J,O

[9] Attachment 9

• Covered with Raychem WCSF-N which is Reference 7.

Davis-Besse

CAT	DESCRIPTION	MANUFACTURER	MOD/TYP	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATT 2 REF#	CONCUR? [1]
IVa 178	Penetration	Amphenol	Unitized Header plate	—	CNT ANN	3 hrs / Yr +	270	59.7	100	H_3BO_3	1×10^8	O	5, 6	No - A, O, I+
IVa 179-182	Mot Con Cont	W	W	Worst Case Parameters	AUX	1 Yr	213	16.41	100	—	1.62×10^6	40 Yr	—	Yes - J, O
Vb 1-2	MOV	Limitorque	SMB-000-5	Comp. Clg.	AUX	≤ 35 sec Ib	NA	NA	NA	—	3.5×10^5 Ib	40 Yr	—	No - D, H, J
Vb 3	MOV	Limitorque	SMB-00-10	Comp. Clg	AUX	4 Hrs	NA	NA	NA	—	3.5×10^5 Ib	40 Yr	20	No - D, H, J
Vb 8-12	Cooler Fan Motor	Louis Allis (Trane)	C065B Ins. Class F	ECCS PP. Rm HVAC	AUX	1 Yr	NA	NA	NA	—	1.62×10^6	40 Yr	—	No - H
Vb 13	MOV	Limitorque	SMB-000	ECCS PP. Rm HVAC	AUX	1 Yr Ib	NA	NA	NA	—	Ib 1.62×10^6	40 Yr	—	No - H, DJ
Vb 14-15	MOV	Limitorque	SMB	ECCS PA Rm HVAC	AUX	1 Yr Ib	NA	NA	NA	—	Ib 1.62×10^6	40 Yr	—	No - H, D, J
Vb 16 A	MOV	Limitorque	SMB-1	Stm Gen Iso at Turb	AUX	Ib ≤ 30 sec	Ib 227.8	Ib 20.13	Ib 100	—	Ib 3.5×10^5	40 yr	—	No - H, J
Vb 20-21	MOV	Limitorque	SMB-4	Stm Gen Iso at Turb	AUX	Ib ≤ 30 sec	Ib 227.8	Ib 20.13	Ib 100	—	Ib 3.5×10^5	40 yr	—	No - H, J
Vb 32-33	Transmitter	Rosemount	1152DPSA22PB	LPI Flow	AUX	1 Yr Ib	NA	NA	NA	—	3.3×10^7	40 yr	15	No - H, A
Vb 34B	Motor	W	Frame 5010 SOP	Decay Heat	AUX	1 Yr	NA	NA	NA	—	1.62×10^6	40 yr	—	No - H
Vb 36B	MOV	Limitorque	SMB-00	LPI Xover	AUX	1 Yr Ib	NA	NA	NA	—	Ib 1.62×10^6	40 yr	—	No - H, J
Vb 35-36	MOV	Limitorque	SMB-1	LPI from BWST	AUX	1 Yr Ib	NA	NA	NA	—	Ib 1.62×10^6	40 yr	—	No - H, J
Vb 42-43	MOV	Limitorque	SMB-000-5	LPI X Conn	AUX	1 Yr Ib	NA	NA	NA	—	Ib 1.62×10^6	40 yr	—	No - H, J
Vb 30A	Motor	?	NSDP FRAME 5807-H	HPI	AUX	1 Yr	NA	NA	NA	—	1.6×10^6	40 yr	—	No - H

[1] Attachment 9 ■ missing Ib - Judgement

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME [10]	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATT 3 REF	CONCUR? [10]
IV b 56	MOTOR	General Dynamics	SOT	Cntmt Spray	Aux	1Yr	NA	NA	NA	—	1.2x10^6	40Yr	—	No-H
IV b 58-59	MOV	Limitorque	SMB-0-15	Cntmt Spray	Aux	1Yr Ib	NA	NA	NA	—	1.6x10^6 Ib	40Yr	—	No-H, J
IV b 62	Motor	W	Frame 256T	H_2 Dilution Fan	Aux	1Yr	NA	NA	NA	—	1.97x10^6	40Yr	—	No-H
IV b 63-67	MOV	Limitorque	SMB-000	H_2 Dilution	Aux	1Yr	NA	NA	NA	—	1.97x10^6	40Yr	—	No-H
IV b 68	Motor	W	Frame 256T	H_2 Dilution Fan	Aux	1Yr	NA	NA	NA	—	1x10^6	40Yr	—	No-H
IV b 70	MOV	Limitorque	SMB-00-10	Cntmt Iso	Aux	≤ 25 sec Ib	NA	NA	NA	—	3.5x10^5 Ib	40Yr	—	No-G, J, H
IV b 102	MOV	Limitorque	SMB-000	Cntmt Iso	Aux	1Yr	NA	NA	NA	—	1.16x10^6	40Yr	--	No-H
IV b 103	MOV	Limitorque	SMB-000	Cntmt Isc	Aux	1Yr Ib	NA	NA	NA	—	1x10^6 Ib	40Yr	—	No-H, J, D
IV b 104-106	MOV	Limitorque	—	Cntmt Iso	Aux	1Yr Ib	NA	NA	NA	-	1.16x10^6 Ib	40Yr	—	No-H, J
IV b 107	MOV	Limitorque	SMB-00-10	Cntmt Iso	Aux	20 sec Ib	NA	NA	NA	—	3.5x10^5 Ib	40Yr	—	No-H, J
IV b 107-110	MOV	Limitorque	SMB-000-5	Cntmt Iso	Aux	1Yr	NA	NA	NA	—	1x10^6	40Yr	—	No-H
IV b 127-129	MOV	Limitorque	SMB-000-5	Cntmt Air Clg	Aux	≤ 45 sec Ib	228 Ib	20.13 Ib	100 Ib	—	3.5x10^5 Ib	40Yr	—	No-H, J
IV b 136-139	Transmitter	Rosemount	1152GP	Rx Prot	CNT	≤ 0.475 sec Ib	350	64.7	100	H_3BO_3	5x10^6 / 1.5x10^8	40Yr	9	No-H, I A J, A
IV b 140-143	RTD	Rosemount	177HW	Rx Prot	CNT	1Yr	325	74.7	100	H_3BO_3	3.8x10^9	40Yr	10	No-H, J, A
IV b 144	Transmitter	Foxboro	EHAH	SFAS	Aux	1Yr	318	90	100	—	3.7x10^7	40Yr	11	No-H, A

[10] Attachment 9

■ missing Ib-Judgement

Davis Besse

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATT 8 REF	CONCUR? [10]
IV b 147-148	Transmitter	Foxboro	E11GH	SFAS	CNT	3mo yr/ 6 sec ■	318	90	100	H_3BO_3	3.7×10^7	40yr ■	11, 17	No-A,H
IV b 189	Transmitter	Foxboro	E11AH	SFAS	AUX	1yr ■	NA	NA	NA	NA	3.7×10^7	40yr ■	11	No-A,H
IV b 190	Transmitter	Foxboro	E13DM	Energ Vent	AUX	1 Yr ■	NA	NA	NA	NA	■ 1.16×10^6	40 yr ■	—	No-H
V ▲ 191	Press. Relay	GE	740	Energ Vent	AUX	1yr ■	NA	NA	NA	NA	■ 1.16×10^6	40 yr ■	—	Yes-G,N
IV b 194	Press Switch	Static-O-Ring	12V2E4M2C	Cnt. Rad. Monit.	AUX	1yr ■ Ib	NA	NA	NA	NA	■ Ib 1.16×10^6	40yr ■	—	No-H,J
IV b 195	Transmitter	Victoreen	841-2	Cnt. Rad. Monit.	AUX	1yr ■ Ib	NA	NA	NA	NA	■ Ib 1.16×10^6	40yr ■	—	No-H,J
IV b 196	Press Switch	Static O-Ring	12V2E4M2C	Cnt Rad Monit	AUX	1yr ■ Ib	NA	NA	NA	NA	■ Ib 1×10^6	40yr ■	—	No-H,J
IV b 197	Transmitter	Victoreen	841-1	Cnt Rad Monit	AUX	1yr ■ Ib	NA	NA	NA	NA	1×10^6 ■	40yr ■	-	No-H,J
IV a ▲ 170-174	Disconnect Sw. Cabinet	GE	—	—	AUX	1yr ■ Ib	NA	NA	NA	NA	Ib ■ 1.62×10^6	40yr ■	—	Yes-O,J
V 4-7	Transmitter	Bailey	BYBB41X-A	AFW	CNT	1 WK	264	55	100	NA	1×10^8	40yr	8	No-F,J,E,N
V 16	Sol. Vv.	ASCO	HTX8316D45	ECCS PP Rm HVAC	AUX	NO QUALIFICATION DATA						#	—	Yes-D,G,J
V 22,23	Sol. Vv	ASCO	NP8320A18E	Stm Gen Iso at Turb	AUX	44yr	346	125	100	—	—	44yr/ # 40yr	19	Yes-G,K,I#
V 24-25 30-31	Sol. Vv.	ASCO	HTX8320	Stm Gen Isoat Turb	AUX	NO QUALIFICATION DATA						#	—	Yes-G,J,D
V 26-29	Sol. Vv.	ASCO	HTX831655	Stm Gen Isoat Turb	AUX	NO QUALIFICATION DATA						#	—	Yes-G,J,D
V	Blank	—	—	—	—	—	—	—	—	—	—	—	—	—

[10] Attachment 9 ▲ out of position ■ missing Ib - Judgement Davis-Besse # Limiting Factor

CAT	DESCRIPTION	MANUFACTURER	MOD/TYPE	NOTES	LOC	OP TIME	TEMP	PRESS	RH	SPRAY	RAD	AGING	ATT 1 REF #	CONCUR? [10]
V 44-49	Sol. Vv.	ASCO	HTX8320	L.P.I.	Aux	NO QUALIFICATION DATA					–	#	–	Yes-G,J,D
V 96	Sol. Vv.	ASCO	HTX8311.C45V	Cntmt Iso	CNT	Being	Replaced		FCR	79-311	–	–	–	Yes
V 97-98	Sol. Vv.	ASCO	HTX8316C45V	Cntmt Iso (–1 Flood	CNT	Being	Replaced		FCR	79-311	–	–	–	No-E,M
V 99	Sol. Vv.	ASCO	HTX8316C45V	Cntmt Iso	CNT	Being	Replaced	FCR	79-311	–	–	–	–	Yes
V 100-101	Sol. Vv.	ASCO	HTX8210	Cntmt Iso	CNT	Being	Replaced	FCR	79-311	–	–	–	–	Yeo
V 111-120	Sol. Vv	ASCO	HT8320/ HTX8320	Cntmt Iso	AUX	NO QUALIFICATION DATA					–	#	–	Yes-G,J,D
V 121-122	Sol. Vv.	ASCO	8344-A5	Cntmt Iso	Aux	NO QUALIFICATION DATA					–	#	–	Yes-G,J,D
V 130-135	Sol. Vv.	ASCO	HTX8320	Cntmt Air Clg	Aux	Being	Replaced		FCR	79-280	–	–	–	Yeo
V 189	Press. Cont.	GE	701	Emerg Vent	Aux	NO # QUALIFICATION DATA					#	#	–	Yes-G NO-I(J)
V 192	Press Relay	GE	9T66Y987	Emerg. Vent	Aux	NO # QUALIFICATION DATA					#	#	–	Yes-G NO-I(J)
V 193	Press Relay	Foxboro	66BT	Emerg Vent	Aux	NO # QUALIFICATION DATA					#	#	–	Yes-G NO-I(J)

[9] Attachment 9 # Limiting Factor Davis-Besse

1. Franklin Institute Research Laboratories
   Test Report F-C3694 (For Okonite Co.)

2. Okonite Company Engineering Test Report No. 141

3. Franklin Institute Research Laboratories
   Test Report F-C2737 (For Kerite Co.)

4. Boston Insulated Wire & Cable Company
   Test Report 73C212

5. Amphenol Technical Report 123-1268
   "Special Prototype Radiation, Enrironmental and
   Short Circuit Testing of a Type 2 Low Voltage Power
   Penetration Assembly"

6. Amphenol Technical Report 123-1269
   "Special Prototype Radiation, Environmental and
   Short Circuit Testing of a Type 1A Medium Voltage Power
   Penetration Assembly"

7. Raychem Corporation Report 71100 Rev. 1

8. B&W Report No. 58-0081-00 (Bailey Transmitters)
   See also B&W Topical Report No. BAW 10003

9. B&W Report No. 58-0220-00 (Rosemount 1152 Transmitters)

10. B&W Report No. 58-0370-00 (Rosemount RTD's)

11. B&W Report No. 58-0079-00 (Foxboro E11G and E11GH Transmitters)

12. B&W Report No. 58-00528-00 (Source Range Detectors)

13. B&W Report No. 58-0529-00 (Intermediate Range Detectors)

14. B&W Report No. 58-0089-01 (Power Range Detectors)

15. Rosemount Test Report No.'s 11741S and 12756B

16. NAMCo Qualification Test Report dated 3/3/78 (NCR 57-78)

17. Wiley Laboratory Test Report No. 26304

18. ASCO Letter of 6/8/79

19. ASCO Report No. AQS21678/TR Rev. A

20. Franklin Institute Test Report No. FC 3441

21. Joy Manufacturing Report X-421 dated 5/8/73

22. Franklin Institute Test Report No. F-C2232-01

23. Limitorque Corporation Report No. 600376A

24. Limitorque Corporation Report No. 600456

25. Franklin Institute Test Report No. F-C3271
Limitorque Corporation Report No. B0003

ATTACHMENT 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

May 23, 1980

MEMORANDUM FOR: E. L. Jordan, Assistant Director, Division of Reactor Operations Inspection, IE:HQ

THRU: G. Fiorelli, Chief, Reactor Construction and Engineering Support Branch

FROM: D. W. Hayes, Chief, Engineering Support Section 1

SUBJECT: SCREENING REVIEW OF LICENSEE RESPONSE TO IEB 79-01B, AND SUMMARY OF INSPECTION OF INSTALLED SYSTEMS AT DAVIS-BESSE UNIT 1 - DOCKET NO. 50-346

Frank Jablonski has completed his initial screening review of the Davis-Besse facility response to IEB 79-01B, and the inspection phase of the system audit.

A walkdown was conducted on May 5, 1980 to inspect installed components associated with the containment Air Cooling system. Prior to the walkdown, P&ID, elementary control, and wiring diagrams were reviewed. Components checked (✓) on the attachment were observed.

Observations:

Motors/Fans[1]

A Reliance type M two speed motor No. X327299A2-EZ with RN insulation was coupled to a Joy fan P/N 600276-17. Further, Joy identification was No. 66/30-1150/570 (2 speed). Onsite test report No. X-457 documents tests performed on Joy fan P/N 600276-17 (above); reference M2 on the licensee's worksheet was test report No. X-411 for a Joy fan P/N 600277-69. This is a typographical error and should be X-421[3].

A "vibration isolator" manufactured by Vent Glas, made of polychloroprene was installed around the circumference of the fan unit at the interface with the discharge dampers. Counter balanced dampers were installed at the fan discharge into the supply plenum. Note 4 on American Warming & Ventilation Inc. Sheet W-D-9867 Revision B states the dampers are designed to function at 120°F. Both the vibration isolator and dampers are separated from the axivane unit when the discharge temperature exceeds 160°F. Separation is accomplished by fusible links.

Maintenance records indicated that lubricant used for both motor/fan unit and dampers is Chevron SRI #2.

Onsite Inspection Report
ATTACHMENT 2

Solenoid Valves[2]

Two solenoid valves for each of three diaphragm operated control valves; ASCO No. HT8320A.

Motor Operated Valves[2]

Operators were SMB-000 with Class B insulated motors manufactured by Reliance.

Terminations

Fan motor[1] terminations were covered with Raychem type WCSF heat shrink tubing.

Instrument[1] terminations at all points were covered with Raychem type WCSF heat shrink tubing. Terminations were made in vapor-tight Crouse-Hinds No. GS200 boxes. Instruments had hermetic seals manufactured by Conax with nonexposed Kapton insulated conductors. Penetration terminations for fan motors and instruments were covered with Raychem type WCSF heat shrink tubing located in Formweld terminal boxes. The boxes had nongasketed covers. No terminal blocks were used.

Penetration[2] terminations outside containment were made similarly to those inside, i.e. with heat shrink tubing; however, multi-point Buchanan terminal blocks were used. NOTE: Within the box observed, terminal blocks were not used to terminate System 17 circuits.

Valve local control termination boxes[2] contained 12 point Stanwick sliding link terminal blocks (very similar to Multi-Amp type). The boxes were Formweld, non vented, covered by a hinged door with rubber gasket. RS conduit was installed top entry with standard double lock nut.

Local Control Stations[2]

Push button and light stations for CV's and MOV's were standard design manufactured by Macworth-Reese. RS conduit was installed side and top entry with standard double lock nuts.

Panels[2]

A disconnect switching panel and motor control center were listed as being in a potentially hostile environment. Neither unit had any information attached to identify model, type, etc.

ATTACHMENT 2

Instrumentation

Specific transmitters used to activate Safety Features, and thus System 17, were installed both inside and outside containment. The reactor coolant pressure[1] transmitter was Foxboro Model E11GH; the containment pressure[2] transmitter was Foxboro Model E11AH.

Cables[1 2]

600v control cable was identified on the jacket by manufacturer's number 8739A. No other markings were apparent. Installation tags identified the cable as type BG5, which translates to Kerite with 65 mil FR jacket and 80 mil HT insulation.

Instrument cable was identified BIW on the jacket by the manufacturer. Installation tags identified the cable as type LP1, which translates to 45 mil Neoprene jacket and 30 mil XLP insulation.

Miscellaneous

All components inside containment were above flood level, i.e. 572 feet 2 inches; all components were properly oriented.

Conclusion

Except as noted above, motors/fans, equipment descriptions provided by the licensee on the system component evaluation work sheets for System 17 are complete and accurate. Only motors/fans, terminating cables, and instruments had referenced qualification test reports. All other components, i.e. MOV's, SV's, panels and local control stations will be included in the licensee's proposed response update scheduled for August 15, 1980.

[1]Inside containment [2]outside containment [3]see Attachment 2

D. W. Hayes, Chief
Engineering Support Section 1

Attachments:
1. Class 1E Elec. Comp. List
2. Notation on Test Rep. X-421

cc w/attachments:
J. G. Keppler
G. Fiorelli
T. Tambling, Ops
L. Reyes, Res. Insp.
V. D. Thomas, IE:HQ

ATTACHMENT 2

ATTACHMENT 1

MASTER LIST

Rev. 0
Date 3-21-80

Davis-Besse Nuclear Power Station Unit 1

2.17 Sheet 1 of 9

(CLASS IE ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS)

SYSTEM: CONTAINMENT AIR COOLING, SYSTEM NO. 17

*IN THE HOSTILE ENVIRONMENT, SEE SYSTEM COMPONENT EVALUATION INDEX SHEET

COMPONENTS			
PLANT IDENTIFICATION NUMBER	GENERIC NAME	LOCATION	
		INSIDE PRIMARY CONTAINMENT	OUTSIDE PRIMARY CONTAINMENT
✓ BE11C *	MOTOR CONTROL CENTER		AM 304
BE12A	MOTOR CONTROL CENTER		AM 429
BE14	MOTOR CONTROL CENTER		AM 429
BE15	MOTOR CONTROL CENTER		AM 429
BEF12	MOTOR CONTROL CENTER		AM 429
BEF15	MOTOR CONTROL CENTER		AM 429A
BF12A	MOTOR CONTROL CENTER		AM 428
BF14	MOTOR CONTROL CENTER		AM 428
BF15	MOTOR CONTROL CENTER		AM 428
C5716	ENGINEERING SAFETY FEATURE PANEL		AM 505
C5755D	SAFETY FEATURE ACTUATION PANEL		AM 505
C5756C	SAFETY FEATURE ACTUATION PANEL		AM 505
C5762D	SAFETY FEATURE ACTUATION PANEL		AM 505
C5763C	SAFETY FEATURE ACTUATION PANEL		AM 505
✓ CDE11C *	DISCONNECT SWITCH CABINET		AM 304
CDE12A-1	DISCONNECT SWITCH CABINET		AM 429
CDF12A-1	DISCONNECT SWITCH CABINET		AM 428
D1P	DISTRIBUTION PANEL		AM 429
D2P	DISTRIBUTION PANEL		AM 428
✓ EV13660 *	EV (TERM BLK) BOX SIZE 1 FOR MV13660		AM 314
EV13670 *	EV (TERM BLK) BOX SIZE 1 FOR MV13670		AM 314
✓ PT2000 *	PRESSURE TRANSMITTER		AM 404
PT2001	PRESSURE TRANSMITTER		AM 501
✓ PTAC12A *	PRESSURE TRANSMITTER	AM 410	
✓ PTAC28A *	PRESSURE TRANSMITTER	AM 407	

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MASTER LIST

Rev. 0
Date 3-21-80
2.17 Sheet 2 of 3

Davis-Besse Nuclear Power Station Unit 1

(CLASS IE ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS)

SYSTEM: CONTAINMENT AIR COOLING, SYSTEM NO. 17

*IN THE HOSTILE ENVIRONMENT, SEE SYSTEM COMPONENT EVALUATION INDEX SHEET

	COMPONENTS			
	PLANT IDENTIFICATION NUMBER	GENERIC NAME	LOCATION	
			INSIDE PRIMARY CONTAINMENT	OUTSIDE PRIMARY CONTAINMENT
✓	MC0011 *	COOLER FAN	RM 317	
	MC0012 *	COOLER FAN	RM 317	
	MC0013 *	COOLER FAN	RM 317	
✓	MV13660 *	VALVE MOTOR OPERATOR		RM 314
✓	MV13670 *	VALVE MOTOR OPERATOR		RM 314
✓	MV13680 *	VALVE MOTOR OPERATOR		RM 314
✓	NV1356 *	LOCAL CONTROL PUSH BUTTON SWITCH		RM 314
✓	NV1357 *	LOCAL CONTROL PUSH BUTTON SWITCH		RM 314
✓	NV1358 *	LOCAL CONTROL PUSH BUTTON SWITCH		RM 314
	NV1358A *	LOCAL CONTROL PUSH BUTTON SWITCH		RM 314
	NV1358B *	LOCAL CONTROL PUSH BUTTON SWITCH		RM 314
	NV13660 *	LOCAL CONTROL PUSH BUTTON SWITCH		RM 314
	NV13680A *	LOCAL CONTROL PUSH BUTTON SWITCH		RM 328
	NV13680B *	LOCAL CONTROL PUSH BUTTON SWITCH		RM 328
	P1L1L *	ELECTRICAL PENETRATION ASSEMBLY	ANNULUS/CONTAINMENT	
	P1L1LI *	INSTRUMENT PENETRATION BOX	RM 316	
	P1L1LX *	INSTRUMENT PENETRATION BOX		RM 303
✓	P1P3BI *	POWER PENETRATION BOX	RM 315	
✓	P1P3BX *	POWER PENETRATION BOX		RM 314
	P2L4G *	ELECTRICAL PENETRATION ASSEMBLY	ANNULUS/CONTAINMENT	
✓	P2L4GI *	INSTRUMENT PENETRATION BOX	RM 410	
	P2L4GX	INSTRUMENT PENETRATION BOX.		RM 427
	P2P5FI *	POWER PENETRATION BOX	RM 410	
	P2P5FX	POWER PENETRATION BOX		RM 427
	P3R4CI *	POWER PENETRATION BOX	RM 410	

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ATTACHMENT 2

MASTER LIST

Rev. 0
Date 9-21-80
2.17 Sheet 3 of 3

Davis-Besse Nuclear Power Station Unit 1

(CLASS IE ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS)

SYSTEM: CONTAINMENT AIR COOLING, SYSTEM NO. 17

*IN THE HOSTILE ENVIRONMENT, SEE SYSTEM COMPONENT EVALUATION INDEX SHEE

COMPONENTS			
PLANT IDENTIFICATION NUMBER	GENERIC NAME	LOCATION	
		INSIDE PRIMARY CONTAINMENT	OUTSIDE PRIMARY CONTAINMENT
P3P4CX	POWER PENETRATION BOX		RM 427
SV135CA *	SOLENOID VALVE		RM 314
SV135CB *	SOLENOID VALVE		RM 314
SV1357A *	SOLENOID VALVE		RM 314
SV1357B *	SOLENOID VALVE		RM 314
SV135BA *	SOLENOID VALVE		RM 314
SV135BB *	SOLENOID VALVE		RM 314
P1P3B *	ELECTRICAL PENETRATION ASSEMBLY	ANNULUS/CONTAINMENT	
P2P5F *	ELECTRICAL PENETRATION ASSEMBLY	ANNULUS/CONTAINMENT	
P3P4C *	ELECTRICAL PENETRATION ASSEMBLY	ANNULUS/CONTAINMENT	
L1P *	INSTRUMENT CABLE	X	
BG5 *	600 V CONTROL CABLE	X	

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ATTACHMENT 2

ATTACHMENT 2

NOTATION ON TEST REPORT X-421

Test Report No. X-421 is for Joy P/N 500722-66 and Reliance Motor No. X325074AZ. The report documents a test performed for Jersey Central Power and Light's Three Mile Island plant. Correlation by Toledo Edison between fan units installed at Three Mile Island and Davis-Besse is pending.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

July 23, 1980

MEMORANDUM FOR: E. L. Jordan, Assistant Director, Division of Reactor Operations Inspection, IE:HQ

THRU: G. Fiorelli, Chief, Reactor Construction and Engineering Support Branch

FROM: D. W. Hayes, Chief, Engineering Support Section 2

SUBJECT: IEB 79-01B (A/I F03067180)

Attached is a copy of a memorandum dated July 17, 1980 received from Frank Jablonski relative to IEB 79-01B. It is being forwarded for your information and solicited guidance.

The question of identification of safety related systems and components (paragraph No. 1 of the memo) is an old one. I disagree with Frank in that I feel that this identification is a responsibility of the licensee, not the NRC. He must know his plant. I do agree, however, that more guidance is needed for our inspectors in this area. This is especially important for those inspectors that have not had reactor operating experience.

The significant differences in master lists that Frank discusses in paragraph two does raise questions. We can only compare these lists against the SAR. Review and evaluation beyond this is assumed to be an NRR function.

In regard to Frank's question - should we assume the licensee's response to IEB 79-01B to be complete and correct - I have told him yes. Further, that if he identifies significant incompleteness in the response, or incorrect information during his reviews, to bring these to my attention so appropriate action can be recommended.

Comments and further guidance is requested concerning matters discussed in paragraphs 3 and 4 of Frank's memo.

D. W. Hayes

D. W. Hayes, Chief
Engineering Support Section 2

Generic Issues
ATTACHMENT 3a

Attachment:
F. J. Jablonski Memo to
D.W. Hayes dtd 7/17/80

cc w/attaci.ment:
J. G. Keppler, RIII
V. D. Thomas, IE:HQ
A. Finkel, RI
R. Hardwick, RII
D. McDonald, RIV
J. Elin, RV
R. F. Heishman, RIII
→ F. J. Jablonski, RIII

ATTACHMENT 3a

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

July 17, 1980

MEMORANDUM FOR: D. W. Hayes, Chief, Engineering Support Section 1

FROM: F. J. Jablonski, Reactor Inspector

SUBJECT: FORMULATING TECHNICAL EVALUATION REPORTS (TER) - REVIEW OF IEB 79-01B
RE: MEMO TO YOU DATED JUNE 16, 1980 - SAME SUBJECT

Since the review of IEB 79-01B is continual, new discrepancies continue to show up; discrepancies are not necessarily the licensees'. As you know, there is no specific nuclear power plant design required by NRC. Further, the designation of safety related systems is somewhat arbitrary and inconsistent. In fact, the NRC places responsibility for classifying safety related systems on the licensee.

Action Item No. 1 of 79-01B requested each licensee to provide a "master list" of all ESF systems in their respective plant required to function during a postulated accident. Appendix A to 79-01B lists "typical" equipment/functions needed for mitigation of an accident. A comparison of master lists was made of four licensees with similar Westinghouse PWRs (see Attachment 1). Arbitrary selection and non-standard nomenclature of systems makes evaluation of the master lists extremely difficult. NRC requested each licensee to submit the information under oath. Should the information therefore be assumed complete and correct?

It is extremely frustrating to review responses which vary so much in attention to detail, depth of review, etc. As stated previously in the draft TER for D.C. Cook, because I as a principal reviewer lack detailed systems/operations experience, further guidance is requested.

Another TER related matter is motorized valves equipped with Limitorque operators (see Attachment 2). As can be seen, each test report is for a specific unit type including motor type and insulation class. Almost all licensees refer to the various test reports as qualification documentation for all series of operator types; never is name plate data provided. For example, test report No. 600456 (SMB-0-40, Reliance Motor with Class RH insulation) may be listed for all operators from series SMB-000 to SMB-5; motor name plate data not provided. Without the name plate data and the basis for extrapolation, a meaningful evaluation cannot be made.

ATTACHMENT 3a

It is requested that this memorandum be forwarded to IE:HQS as an addition to A/I F03067180 with the same copy distribution.

F. J. Jablonski

F. J. Jablonski
Reactor Inspector

Attachments:
1. Comparison of Master Lists
2. Motor Operated Valve Tests

cc:
J. G. Keppler
G. Fiorelli

ATTACHMENT 3a

ATTACHMENT 1

SYSTEMS	P.I.	COOK	KEW.	PT. BCH.
Aux. F.W.	X	X		X
Chem. & Vol. Cont.	X	2	X	X
Cntmt. Air Hndlg.	X	X		X
Cntmt. H_2 Cont.	X	X		
Cntmt. Sp.	X	X		1
Main Stm.	X	X		X
Aux. Stm.	X			
Stm. Dump	X			
Rx Clnt.	X	X	X	X
Res. Ht. Rm.[1]	X	2	X	3
Saf. Inj.[1]	X	2	X	X
Clg. Water	X			
Esnt'l. Serv. Wat.		X		
Comp. Clg. Wat.		X		3
Emerg. Core Clg.[2]	1	X	1	
Aux. Clnt.[3]				X
Cntmt. Purge	X			
Rx. Bldg. Vent			X	
Inst. & Prot.	X			
Rx. Trip. Act.		X		
Rx. Cont. & Prot.				X
Rad. Monit.	X			
Rx. Hot Samp.	X			
Stn. & Inst. Air	X			
Stm. Gen.BD	X			
Post Acc. Monit.		X		
Rem. Sht. dn. Monit.		X		
Cntmt. Isol.		X		X
Mn. Stm. Isol.		X		
Mn. FW Isol.		X		

ATTACHMENT 3a

ATTACHMENT 2

MOTOR OPERATED VALVES

MOV's

1. There are basically two type series of Limitorque operators: SMB and SB. The operators are sized from 000 (smallest) to 5 (largest) as follows:

SMB-000
SMB-00
SMB/SB-0[1]
SMB/SB-1
SMB/SB-2
SMB/SB-3
SMB/SB-4
SMB-5

This series may also include SB

This series may also include WB

This series may be suffixed "T"

2. Test Reports include:

Report No.	Date	Unit Type	Environment	Motor Type	Insulation
a. 600198	1-2-69	SMB-0-15*	PWR No Radiation	Reliance	Special Hi Temp
b. 600426 (B-0009)	4-30-76	SMB-0-25*	BWR 1×10^7 R 340°	Peerless DC	H
c. 600376A FIRL F-C 3441	5-15-76	SMB-0-25*	BWR 2×10^8	Reliance	RH
d. 600456	12-9-75	SMB-0-40*	PWR 2×10^8	Reliance	RH
e. 600461	6-7-76	SMB-0-25*	Outside Cntmt 2×10^7	Reliance	B
f. WCAP7410L 7744	12-70 8-71	SMB-00			B

*denotes foot pounds of torque

[1]only SMB-0 has been tested seismically Re: a, b, c

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SSINS #6820

JUL 3 1980

MEMORANDUM FOR: Z. R. Rosztoczy, Branch Chief, Equipment Qualification Branch, Division of Engineering, NRR

THRU: Haw for E. L. Jordan, Assistant Director for Technical Programs, Division of Reactor Operations Inspection, IE

FROM: V. D. Thomas, Task Manager, Review Group, IEB 79-01B, Division of Reactor Operations Inspection, IE

SUBJECT: REQUEST FOR NRC POSITIONS ON REVIEW QUESTIONS OF IEB-79-01B LICENSEE RESPONSES

In accordance to our verbal agreement, we would be happy if you would provide positions on the questions noted in the enclosed memoranda.

Since it is essential to establish a uniform approach to the review effort to obviate the questions being generated in the on-going review of licensee responses we will be happy to meet with your staff to discuss these concerns to expedite resolution of the issues.

Vincent D. Thomas

Vincent D. Thomas, Task Manager
Review Group, IEB 79-01B

Enclosures:
1. Memo D. W. Hayes to G. Fiorelli, RIII dated June 20, 1980.
2. Memo F. Jablonski to D. Hayes, RIII dated Jun 16, 1980.
3. Memo F. Jablonski to D. Hayes, RIII DATED June 10, 1980.

cc: w/enclosures
E. L. Jordan, IE
V. S. Noonan, NRR
G. Fiorelli, RIII
D. W. Hayes, RIII
A. Finkel, RI
R. Hardwick, RII
F. Jablonski, RIII
D. McDonald, RIV
J. Elin, RV

JUL 7 1980

ATTACHMENT 3a

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

June 20, 1980

MEMORANDUM FOR: E. L. Jordan, Assistant Director, Division of Reactor Operations Inspection, IE:HQ

THRU: G. Fiorelli, Chief, Reactor Construction and Engineering Support Branch

FROM: D. W. Hayes, Chief, Engineering Support Section 1

SUBJECT: IEB 79-01B (A/I F03067180)

Attached are two memorandums from one of my inspectors, Frank Jablonski. The first is dated June 10, 1980 and the second June 16, 1980. Both memos raise basic questions for which we require guidance to complete our review of responses to IEB 79-01B.

By this memo I also would like to confirm our understanding that NRR (Environmental Qualification Branch) will review for acceptability all test reports and other documentation which licensees reference as establishing environmental qualification of instrument/electrical equipment. In connection with this, we are sending under separate cover test reports, etc. in our possession to be forwarded to the Environmental Qualification Branch. (We further understand that the IEB 79-01B task group, on a volunteer basis, may agree to review some of these documents).

The status or schedule for site inspections and review/evaluation of the final reports is also attached. Please note that every licensee has asked for some sort of time extension to submit their first report. We understand that the other regions have had similar reporting problems. Assuming that all our licensees meet their extended submittal dates, we should complete our site inspections, reviews, and technical evaluation

ATTACHMENT 3a

reports by the end of December 1980. Further delays in the submittals or any unforeseen events will hamper our ability to meet the new February 1, 1981 deadline.

D. W. Hayes, Chief
Engineering Support Section 1

Attachments:
1. Memo F. Jablonski to D. Hayes 6/10/80
2. Memo F. Jablonski to D. Hayes 6/16/80
3. Inspection Status/Schedule
4. "Separate Cover" List (Test Reports Sent to IE:HQ)

- Separate Cover: See Attachment 4

cc w/attachments 1, 3, & 4 only:
J. G. Keppler
G. Fiorelli
V. D. Thomas, IE:HQ
A. Finkel, RI
R. Hardwick, RII
D. McDonald, RIV
J. Elin, RV
R. F. Heishman

ATTACHMENT 3a

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

June 10, 1980

MEMORANDUM FOR: D. W. Hayes, Chief, Engineering Support Section 1

FROM: F. J. Jablonski, Reactor Inspector

SUBJECT: EFFECT OF PREVIOUS NRR REVIEW ON MATTERS RELATING TO IEB 79-01B

In almost every licensee response to IEB 79-01B there is a subtle or direct reference to matters apparently reviewed by NRR. Because of the referenced dates it is assumed by me that NRR has given either tacit or direct approval to the references; examples follow:

1. All licensees refer to their FSARs for establishing the list of engineered safety feature systems and environmental data such as temperature, pressure, radiation, etc.

2. One licensee, Wisconsin Public Service Corporation, states that "The AEC, in their "Safety Evaluation of the Kewaunee Plant", Section 7.5, issued July 24, 1972, concluded that our criteria and testing program for environmental qualification were adequate". It is further stated that "Our FSAR, which was approved by the AEC, discusses at length the post accident conditions and required qualifications for applicable equipment. (See Section 7.5 of the Kewaunee FSAR.)"

3. Two licensees, American Electric Power and Wisconsin Public Service Corporation, have discussed the effect of components below flood level simply by referencing letters previously submitted to the NRC, or FSAR questions/answers as follows:

   * AEP - Letter dated 9-29-75 from Tillinghast (AEP) to Kniel (NRC); FSAR question 40.10 Appendix Q.

   * WPSC - Letter dated 2-2-76 from James (WPSC) to Purple (NRC).

ATTACHMENT 3a

My specific concerns are:

Is it to be assumed that the referenced FSAR parameters, No. 1 above, are correct, i.e. reviewed by NRR?

If the answer is yes, then should it also be assumed that No. 2 above is likewise adequate? (If the answer is no, then none of the licensee responses which reference the FSAR can be assumed to be correct.)

Reference No. 3, even though a component may not be required to operate subsequent to flooding, what effect will short circuits have on containment electrical penetrations? Was this considered by NRR?

I am requesting that these questions/concerns be forwarded to the Assistant Director, Division of Reactor Operations Inspection for resolution.

F. J. Jablonski

F. J. Jablonski
Reactor Inspector

cc:
J. G. Keppler
G. Fiorelli

ATTACHMENT 3a

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

June 16, 1980

MEMORANDUM FOR: D. W. Hayes, Chief, Engineering Support Section 1

FROM: F. J. Jablonski, Reactor Inspector

SUBJECT: FORMULATING TECHNICAL EVALUATION REPORTS (TER) - REVIEW OF IEB 79-01B

In accordance with IEB 79-01B, an overall conclusion relative to the qualification of instrument electrical equipment is to be made for each operating plant based on a screening review of all plant systems, and by a detailed review and observation of specific system components. Unresolved concerns previously identified by RIII inspectors during reviews of IEC 78-08 and IEB 79-01 along with subsequently identified concerns make it difficult for us to formulate meaningful TERs for certain plants. The previous unresolved concerns are documented in the memorandums listed below (1,2,3) and are reiterated in Attachment A to this memo. Subsequently identified concerns are listed in Attachments B, C, and D.

To assure uniform evaluation, guidance is needed for these items. Please forward these concerns to IE:HQ.

1. TI 2515/13 - Qualification of Safety Related Electrical Equipment Fiorelli to Sniezek, 10/13/78

2. Same title as 1., Fiorelli to Klinger, 12/78

3. Review Status of Responses to IEB 79-01, Hayes to Jordan, 9/5/79

F. J. Jablonski

F. J. Jablonski
Reactor Inspector

Enclosures: As Stated

cc:
J. G. Keppler
G. Fiorelli
V. D. Thomas, IE:HQ
A. Finkel, RI
R. Hardwick, RII
D. McDonald, RIV
J. Elin, RV

ATTACHMENT 3a

ATTACHMENT A

1. Foxboro Models E11GM and 611/613 transmitters with MCA modification are believed by RIII to be under a generic review by NRR. It is RIII's further belief that the "MCA" modification does not make the transmitters suitable for use in a radiation environment. Is Region III's understanding correct?

2. Several licensees have declined replacement of limit switches which provide position indication of valves used for primary containment isolation. Are these switches required to be qualified?

3. GE cable type SI-57275 is used on penetrations manufactured by GE. Penetrations with this type cable are installed at Monticello, Dresden 1 and 2, Quad Cities 1 and 2, and Duane Arnold. The cables withstood LOCA tests performed by Wyle Laboratories, Report No. 44114-2; however, the cable did not pass the IPCEA S-19-81 vertical flame test. Further, in the same Wyle test, GE cable SI-58136 failed at radiation levels in excess of 5×10^6 rads. We recognize that in regard to GE cable type SI-57275 flame tests are not part of the environmental qualifications addressed in IEB 79-01B, but it makes no sense to find these penetrations acceptable per IEB 79-01B knowing that they may not meet other requirements.

   Concerning GE type SI-58136 cable, this item should be evaluated on a generic basis since many of the early GE plants use this cable.

4. One licensee, American Electric Power, lists a letter No. NS-TMA-1950, W to NRR, as technical reference for qualification of ITT Barton differential pressure transmitters. Please supply us with the disposition and status of the letter.

ATTACHMENT B

The following questions are based on our review of some licensee submittals to IEB 79-01B:

1. Licensees maintain that aging is not a required consideration for components that are included in a routine periodic inspection and calibration program. Is this acceptable?

2. Licensees maintain that aging is a generic industry issue whose resolution is not clear; therefore, evaluation has not been made or will continue to be made as relevant information is made available.

3. Licensees are referencing manufacturers' letters as establishing the qualification of ancillary parts such as lubricants, tapes, etc. Is this acceptable or are manufacturers' test reports required?

4. Limit switches used for valve position indication only have been deleted from the submittal. Licensees maintain that a valve outside containment in series with one inside can have its position verified visually following an accident. Is this acceptable?

5. The licensees maintain that neither valve position limit switches, solenoid valves, nor control cables for air operated containment isolation valves need be replaced or protected from the adverse environment, including flood, because all postulated failures will result in the isolation valve assuming its fail-safe position. Is this acceptable.

6. Some fan cooler motors do not meet FSAR requirement of 1.5×10^8 rads. Qualification test was to 1.4×10^8 rads. Licensee states radiation

level is "close enough" to expected accident radiation level to be acceptable. Is this acceptable to the NRC?

7. Attachment D is a summary of problems incurred during a one year operation test of a containment fan cooler unit. Would you consider the test to be a success?

ATTACHMENT C

1. In lieu of a test report, what constitutes an acceptable Certificate of Compliance?

2. What if the test specimen and installed component differ, e.g., model, type, etc?

3. What, as a minimum, must be included for an analysis to be acceptable?

4. The guidance provided in Enclosure 4 of 79-01B allows analysis (evaluation) for service conditions such as radiation and chemical sprays. Is analysis (evaluation) and "engineering judgment" the same thing?

5. Since effects of radiation and chemical spray are "allowed" to be analyzed (evaluated) for important components such as containment electrical penetrations, is it prudent to require a licensee to prepare a full blown analysis to qualify a 7/C 12 AWG cable when a similar 5/C 14 AWG cable was actually tested and shown to be qualified?

6. Provide us with ± limits for evaluation of test data such as pressure, temperature, radiation, duration, chemical spray, and aging.

7. Most tests include only single components and the reports do not include any acceptance criteria. Test conclusions are that usually, no matter what happens during the test, the component is accepted. This is commonly referred to as a "dead bug" test. Provide us with minimum acreptance criteria requirements for a test and its report to be acceptable.

ATTACHMENT D

[illegible] MANUFACTURING CO
[illegible], CALIFORNIA

PAGE 1 OF [illegible]
REPORT NO 3-F-1
PREPARED BY L. [illegible]
CHECKED BY J.T. [illegible]
DATE April [illegible], 1977

The following is a brief summary of the problems incurred during the one year extended operation phase of the qualification test.

DATE	TOTAL ON LINE TIME	LENGTH OF DOWN TIME	REASON
12-13-75	75.3	1-3/4 Hours	Maintenance problem caused loss of power.
12-17-75	100.2	2-1/4 hours	Transformer coil burned out.
12-23-75	373.8	2-1/4 hours	Loss of plant power.
1-13-76	827.5	15 min.	Electrical storm caused loss of plant power.
2-17-76	1643	9 hours	Spray rings plugged. Rigged bypass for cooling water. Shutdown required to drill holes in test chamber.
2-21-76	1741.5	15 min.	Plant maintenance required cut-off of power.
3-3-76	2211.5	40 min.	Electrical storm caused two short shutdowns because of temporary power interruption.
3-18-76	2352.7	4 hours	Tripped on overload. Faulty solenoid caused condensate to back up in chamber.
3-19-76	2384	2 hours	Unknown.
4-12-76	2847.5	10 days	Bearing problem; see Appendix C.
4-22-76	2884	5-1/2 hours	Unknown.
4-29-76	3007.9	9 hours	Unknown - Installed recording equipment amps and voltage to detect nuisance trips.
4-30-76	3022.6	2-1/2 days	Nuisance trip due to overload heater failure; length of shutdown because failure occurred late Friday and parts not available until Monday.

DATE	TIME ON HEATER	LENGTH OF TRIP	REASON
5-9-76	3140	No Trip	Problem with dump valves but corrected without shutdown.
7-15-76	4759.5	1 hour	Power failure due to electrical storm.
[illegible]-6	5109.8	2-1/2 days	Terminal board ruptured causing loss of pressure in chamber. This board was a seal required for testing and was not a part of equipment being qualified.
8-14-76	5369.2	6 hours	Power failure.
8-19-76	5487.3	No Trip	Slight problem in the controls causing a slight cycling of temperature. Problem corrected without shutdown.
8-19-76	5502.6	6-1/2 hours	Faulty solenoid resulting in condensate backing up in chamber and causing motor to trip on overload.
8-20-76	5601.4	2-1/2 hours	Solenoid did not function properly and override circuit did not operate. Motor tripped on overload.
8-30-76	5725	No Trip	Temperature was down slightly. Solenoid had failed to operate but override circuit was venting chamber. Problem was corrected without shutdown.
8-31-76	5752	2 hours	Motor tripped on overload. Float valve stuck causing condensate to build up in chamber.

ATTACHMENT 3a

None

Site Specific Issues
ATTACHMENT 3b

SECTION 1

ENGINEERED SAFETY FEATURE SYSTEMS REQUIRED TO FUNCTION FOR LOCA/HELB ACCIDENT CONDITIONS

1. Emergency Diesel Generator and Support Systems
2. Service Water System
3. Component Cooling Water System
4. Auxiliary Feedwater System
5. Emergency Core Cooling System Pump Room HVAC
6. 1E Switchgear Room HVAC
7. Control Room HVAC
8. Steam Generator Isolation at Containment
9. Steam Generator Isolation at the Turbine
10. Low Pressure Injection System
11. High Pressure Injection System
12. Borated Water Storage Tank
13. Reactor Coolant Pump Seal Return Valves
14. Containment Spray System
15. Hydrogen Dilution System
16. Containment Isolation Valves
17. Containment Air Cooling System
18. Reactor Protection System
19. Safety Features Actuation System
20. Steam and Feedwater Rupture Control System
21. Generic 1E Electrical Components
22. Emergency Ventilation System
23. Containment Gas Analyzer System
24. Containment Radiation Monitoring System
25. Core Flooding System

SYSTEMS LIST

B&W PWR

1. Reactor Protection
2. Safeguards Actuation
3. Containment Isolation
4. Main and Auxiliary Steam Isolation
5. Main and Auxiliary Feedwater Isolation
6. Feedwater Control
7. Containment Spray
8. Containment Air Purification/Cleanup
9. Containment Ventilation/Cooling
10. Containment Combustible Gas Control
11. High Pressure Injection
12. Low Pressure Injection
13. Accumulators
14. Residual Heat Removal
15. Chemical and Volume Control
16. Pressurizer Spray
17. Power Operated Relief Valves
18. Steam Dump
19. Containment Radiation/Monitor
20. Containment Radiation/Sampling
21. Component Cooling Water
22. Service Water
23. Emergency Power
24. Containment Sump
25. Control Room Habitability
26. Safety Equipment Area Ventilation
27. Auxiliary Feedwater
28. Reactor Coolant

CATEGORY

I. Equipment is Qualified for Plant Life

a. Equipment meets all applicable requirements of DOR Guidelines or NUREG-0588.

b. Qualification by judgement may be acceptable with sufficient basis.

II. Equipment is Qualified with Restrictions

Equipment meets all applicable requirements of DOR Guidelines or NUREG-0588 with the following limitations:

a. Equipment Qualification for service life less than the plant life.

b. Equipment requires modification to meet qualification requirements, such as relocation or shielding.

III. Equipment is Exempted from Qualification

Equipment where safety related function can be accomplished by redundant fully qualified equipment which meets single failure criteria.

IV. Qualification of Equipment Unresolved

a. Qualification Testing scheduled, but not complete.

b. Qualification Records search still in progress.

V. Equipment Not Qualified

LER

TOLEDO EDISON

September 10, 1980

L80-1061
FILE: RR 2 (NP-33-80-73)

Docket No. 50-346
License No. NPF-3

Mr. James G. Keppler
Regional Director, Region III
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

Reportable Occurrence 80-061
Davis-Besse Nuclear Power Station Unit 1
Date of Occurrence: August 12, 1980

Enclosed are three copies of Licensee Event Report 80-061 with a supplemental information sheet which is being submitted in accordance with Technical Specification 6.9 to provide 30 day written notification of the subject occurrence.

Yours truly,

Terry D. Murray

Terry D. Murray
Station Superintendent
Davis-Besse Nuclear Power Station

TDM/ljk

Enclosure

cc: Mr. Victor Stello, Jr., Director
Office of Inspection and Enforcement
Encl: 30 copies

Mr. Norman Haller, Director
Office of Management Program Analysis
Encl: 3 copies

Mr. Luis Reyes
NRC Resident Inspector
Encl: 1 copy

LER's
ATTACHMENT 7

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1 | O H D B S 1 | (2) | Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø Ø | (3) | 4 1 1 1 1 | (4) | | (5)
LICENSEE CODE / LICENSE NUMBER / LICENSE TYPE / CAT

CON'T
0 1 REPORT SOURCE | L | (6) | Ø 5 Ø - Ø 3 4 6 | (7) | Ø 8 1 2 8 Ø | (8) | Ø 9 1 Ø 8 Ø | (9)
DOCKET NUMBER / EVENT DATE / REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 (NP-33-80-73) On 8/12/80 at 0900 hours, I&C personnel were checking their calibration
0 3 and maintenance records and discovered that valve SV5005 was installed on 8/26/76 for
0 4 temporary use and never replaced. This valve controls the containment purge isolation
0 5 damper CV5005 and was not qualified for nuclear service. Being a Safety Features
0 6 Actuation System level 1 valve, it must be operable in all modes. Therefore the
0 7 station entered the action statement of T.S. 3.3.2.1. There was no danger to the
0 8 public or station personnel. The installed valve functioned properly since installed.

SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
S D (11)	D (12)	Z (13)	V A L V O P (14)	F (15)	Z (16)

(17) LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
8 Ø	—	Ø 6 1	/	Ø 3	L	—	Ø

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
[illegible] (18)	C (19)	Z (20)	Z (21)	Ø Ø Ø Ø	Y (23)	N (24)	Z (25)	Z 9 9 9 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 The cause was an inadequate implementation of an administrative control. SV5005 was
1 1 originally installed for temporary use, however there are no records to indicate any
1 2 followup. When SV5005 was determined unqualified, CV5005 was declared inoperable and
1 3 secured in its closed position. Facility Change Request 80-206 has been written to
1 4 replace SV5005 with a nuclear service grade valve.

1 5 FACILITY STATUS | A | (28) % POWER | Ø Ø Ø | (29) OTHER STATUS (30) | NA | METHOD OF DISCOVERY | B | (31) DISCOVERY DESCRIPTION (32) | Comparison of bad valve with known good one

1 6 ACTIVITY RELEASED | Z | (33) CONTENT OF RELEASE | Z | (34) AMOUNT OF ACTIVITY (35) | NA | LOCATION OF RELEASE (36) | NA

PERSONNEL EXPOSURES
1 7 NUMBER | Ø Ø Ø | (37) TYPE | Z | (38) DESCRIPTION (39) | NA

PERSONNEL INJURIES
1 8 NUMBER | Ø Ø Ø | (40) DESCRIPTION (41) | NA

LOSS OF OR DAMAGE TO FACILITY (43)
1 9 TYPE | Z | (42) DESCRIPTION | NA

PUBLICITY
2 0 ISSUED | N | (44) DESCRIPTION (45) | NA

ATTACHMENT 7

TOLEDO EDISON COMPANY
DAVIS-BESSE NUCLEAR POWER STATION UNIT ONE
SUPPLEMENTAL INFORMATION FOR LER NP-33-80-73

DATE OF EVENT: August 12, 1980

FACILITY: Davis-Besse Unit 1

IDENTIFICATION OF OCCURRENCE: Non-Qualified Solenoid Valve Operator Installed on Containment Purge Valve

Conditions Prior to Occurrence: The unit was in Mode 5 with Power (MWT) = 0 and Load (Gross MWE) = 0.

Description of Occurrence: On August 12, 1980 at 0900 hours, Instrument and Controls (I&C) personnel were comparing a suspected bad solenoid valve with a known good one, SV5005. This good valve, SV5005, controls the Containment Purge Inlet Isolation Damper CV5005. A check of I&C calibration and maintenance records showed that SV5005 was installed August 26, 1976 for temporary use and was never replaced with the proper valve. This temporary valve is not qualified for nuclear service and is not acceptable in this application. Therefore, CV5005 was declared inoperable and secured in its closed position.

Being a Safety Features Actuation System (SFAS) incident level 1 valve, CV5005 must be operable in all modes, and therefore, the station entered the action statement of Technical Specification 3.3.2.1. This action statement required the valve to be secured in its safety position, closed.

Designation of Apparent Cause of Occurrence: The cause was an inadequate implementation of an administrative control during the initial plant testing and system turnover. At the time the valve was installed, it was known that it was for temporary use. I&C's Instrument Information Sheet shows that at the time of the installation, it was known that this solenoid valve was installed for temporary use until a proper valve was received. The installation of this temporary valve without proper documentation was not in compliance with the administrative requirements of AD 1844.00, "Maintenance".

Analysis of Occurrence: There was no danger to the health and safety of the public or to station personnel. The installed valve did function properly in all testing since it was installed.

Corrective Action: An ongoing review of I&C records is being conducted to verify that there had been no other maintenance activities conducted during initial startup and testing that were completed without conforming to the administrative requirements of AD 1844.00. No additional discrepancies have been found.

On August 12, 1980 when it was determined that the installed SV5005 solenoid valve was not qualified for its application, CV5005 was declared inoperable and secured in its closed position. The valve will remain closed until a suitable replacement is installed. Nonconformance Report 292-80 was issued to ensure a qualified solenoid

valve is used. Facility Change Request 80-206 has been written to replace SV5005 with an available nuclear service grade solenoid valve.

Failure Data: There have been no previous reports of this type damper being declared inoperable due to the installation of a non-qualified solenoid valve.

LER #80-061

UNRESOLVED GENERIC - SPECIFIC ISSUES

1. No answer was ever received to the Generic Issues, Attachment 3a, discussed in attachment 2 of memorandum Hayes to Jordan dated June 20, 1980.

2. There are no unresloved specific issues.

Unresolved Generic - Specific Issues
ATTACHMENT 8

A. Meets or exceeds specified parameters#; subject to review and approval by NRR/EQB of test reports or other documentation.

B. Blank

C. See Attachment 3a, July 17, 1980 memorandum Jablonski to Hayes, "Motorized Valves".

D. Not required to function in a hostile environment.

E. Becomes submerged; not known if replacement part qualified.

F1. Being replaced; reference Field Change Request (FCR) 78-525.

F2. Being replaced; reference FCR 79-28.

G. Will be replaced, relocated or tested by 6/82.

H. Information not available until 3/31/81.

I. Not qualified*.

J. Basis ofr continued operation included.

K. Known to be qualified for 4.4 years.

L. Calculated temperature six days post LOCA is 120°F.

M. Becomes submerged; effects of short circuits on plant operator action or containment electrical penetrations not addressed.

N. No LER.

O. The required qualification data will be obtained by testing performed on representative samples of equipment. It is anticipated the testing will be completed by 12/31/81.

#Beyond reviewer's expertise to determine specification adequacy.

Concurrence Code
ATTACHMENT 9