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March 9, 1981

Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: LaSalle County Station Units 1 and 2
Environmental Qualification of Safety-Related Equipment in Harsh Environments
Supplemental Report
NRC Docket Nos. 50-373/374

References (1): L. O. DelGeorge letter to B. J. Youngblood, dated October 31, 1980.

Dear Mr. Youngblood:

Based on recent discussions with you and other members of the NRC Staff, Commonwealth Edison understands that the environmental qualification review for safety-related equipment in harsh environments at LaSalle County Station will be made against the criteria set forth in NUREG-0588. Although in reliance on previous directives from the Staff, which will be summarized in this letter, Commonwealth Edison completed that review against the so-called DOR Guidelines (see Reference (1)), an assessment of the conformance of the LaSalle County equipment in harsh environments against NUREG-0588 Category II has also been completed, and the results are reported in Attachment I to this letter. In those cases for which available documentation does not exist to demonstrate conformance with the criteria in NUREG-0588, a reevaluation program will be compelted by June 30, 1981 to determine the need for supplemental requalification testing. That testing, as required, will be scheduled for completion by May 1, 1982 with final demonstration of qualification to NUREG-0588 to be completed by June 30, 1982.

At this point it is important to note that a review of all LaSalle County Unit 1 safety-related equipment in harsh environments has been completed against the DOR Guidelines and was submitted to the NRC Staff on October 31, 1980. It is judged on the basis of this review that all such equipment on LaSalle County Unit 1 is qualified for interim operation until the requalification program described in the Attachment has been completed. This conclusion is supported by the NRC response to Question 3 documented in Supplement

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No. 2 of IE Bulletin No. 79-01B in which it was stated, "While there are differences between the Category II column of NUREG-0588 and the DOR Guidelines, the differences are in details and in the optional part of the docuements. The minimum requirements set forth by these documents are general and compatible. Thus, the minimum standards set by either of the two documents are equally applicable to ORs and NTOLs." That NRC position statement supports the position stated at the July 16, 1980 IE Regional Meeting on Environmental Qualification held in Chicago. It was on the basis of the NRC position documented in the handouts of that meeting that the LaSalle County review was initiated in the summer, 1980 against the DOR Guidelines. Furthermore, in a meeting of July 24, 1980 between Commonwealth Edison and other members of the BWR Licensing Review Group and the NRC Staff including Mr. Z. Rostozy, the Staff was advised of the LaSalle County intention to conduct the review against the DOR Guidelines, and the Staff concurred in that position at that time. A copy of the LRG position is attached for information (Attachment 2).

Although it is admittedly within the prerogative of your Staff to revise the review basis for LaSalle County Station, the preceeding commentary gives evidence to the long standing acceptability of the DOR Guidelines as a basis for assessing the adequacy of equipment qualification. Commonwealth Edison has documented the completion of the review against the DOR Guidelines, Commonwealth Edison has made available in Bethesda, Maryland the equipment documentation packages for NSSS equipment to facilitate the Staff review, and Commonwealth Edison will deliver any completed documentation package for which conformance to NUREG-0588 has been shown upon request by the NRC Staff.

It is our intention to provide, in as timely a manner as is possible, any further information your Staff may request. We ask only that our submittals not be characterized as untimely, where the facts clearly indicate that: (1) the review already completed and documented in October, 1980 demonstrates the adequacy of LaSalle County equipment, (2) the NRC Staff did not until February 13, 1981 indicate the unacceptability of the DOR Guidelines as the <u>review basis</u> for LaSalle County Station; and (3) the NRC Staff has itself been remiss in reviewing the materials already submitted on the LaSalle County docket.

If you have any questions in this regard, or wish to discuss the re-evaluation program delineated in the Attachment, please contact this office.

Sincerely,

L. O. DelGeorge

L. O. DelGeorge
Nuclear Licensing Administrator

Attachments

cc: NRC Resident Inspector - LSCS

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ATTACHMENT 1

LaSalle County Station Units 1 & 2
Environmental Qualification of Class 1E Equipment
In Accordance with NUREG 0588 (Category II)

Outline of Wyle Laboratory's
Qualification Program Plan
Purchase Order 804525-A
March, 1981

1. Introduction & Summary

Commonwealth Edison has identified the electrical equipment at LaSalle Station Units 1 & 2 which may experience HARSH environments due to Loss of Coolant Accidents (LOCA) Feedwater Line Break Outside Primary Containment and High Energy Line Break accidents (HELB). The equipment identified by Edison included:

a. Equipment needed to bring the reactor to a cold shutdown condition following the defined accidents.

b. Equipment needed to remove core decay heat to preserve integrity of fission product barriers.

c. Equipment that must not fail in a manner detrimental to the above two safety functions.

Plant locations and equipment functions have been identified in terms of safety, i.e. active (must function), passive (must preserve pressure boundary integrity), and "important to safety" in that equipment must not function or interact deleteriously with safety equipment.

An earlier evaluation of equipment qualification to the DOR Guidelines has been made to determine the environmental qualification status of LaSalle equipment. The current program is designed to reevaluate the previously identified items and through application of the approach described in this program plan achieve full qualification status to NUREG 0588 (Category II) requirements.

Plant environments have been tabulated for equipment locations. These environments have been grouped into four bounding environmental envelopes for the purpose of simplifying the qualificiation analysis & testing efforts.

Equipment items have been grouped by Manufacturer and Model into equipment lists; the HARSH environment zones have 88 separate list entries. Ninety-five list entries are associated with NON-HARSH environmental zones. These lists will change as definitions of functional times are refined for certain equipments.

Extensive data search through qualification reports and records at Wyle Laboratories and at other sources plus the vendors engineering

record files is nearing completion. Analytical evaluations on aging are underway on 29 of the 88 list entries. Qualification assessment files are retained open for receipt of applicable data until the analytical work is completed. At that time a recommendation is made for qualification testing to assure full compliance with the requirements.

The sequence of individual list entries therefore, produces a sequence of test recommendations. These recommendations are reviewed by the utility for test approval or a replacement decision. Test procedures are written for groups of similar equipment items and list entries where possible. These test procedures are amplified into test schedules to assure that effective testing is done on a schedule which meets the objective dates.

2. Schedule

The master schedule lists the completion dates for the last list entry. Major milestones for LaSalle are as follows:

Date Collection	
Completion of Evaluation (Analysis)	June 30, 1981
Decision on Last Recommendation	July 31, 1981
Completion of Last Test Series	May 1, 1982
Final Qualification File Completed	June 30, 1982

3. Evaluation

Analytical techniques used in Reevaluation of equipment include: thermal lag analysis, test duration analysis, degradation equivalency analysis, safety functional time analysis.

4. Qualification Test Schedule

Combinations or groupings of equipment items into test baskets based on enviromental profiles enable sequential testing with minimum schedule upset. The sequence of testing includes:

a. Test plan (procedure) approval
b. Baseline functional tests
c. Radiation aging
d. Functional tests
e. Time-temperature from aging or cyclic aging
f. Functional test
g. Extreme environments
h. Functional tests
i. Seismic qualification
j. Functional test
k. Harsh environments
l. Functional test
m. Test Report issued

5. Quality Assurance

An Edison approved QA Program at Wyle is utilized for this work. Document control and review of analytical conclusions, test procedures, and test results are major coverages for this qualification effort.

6. STATUS

LSCS Harsh Environment Equipment Qualification

Category II NUREG-0588 Intitial Status Report (March 10, 1981)

DEGREE of QUALIFICATION ATTESTED TO DATE	NSSS EQUIPMENT	BOP EQUIPMENT	TOTAL EQUIPMENT
Qualified to Cat. II Requirements of NUREG-0588	2	5	7
Under EQ Analysis	15	34	49
Under EQ Testing	22	10	32
Total	39	49	88

A. The following EQ folders are essentially complete (i.e. test reports not yet filed but report has been evaluated):

Table and Item Number	Equipment Name
M.5-1 (4 & 5)	Electrical Penetration (Conax)
M.5-1 (11 & 12)	Level and Pressure Transmitter (Rosemont 1152)
M.5-1 (38)	Limit Switch (NAMCO EA-180)
M.5-1 (31)	Solenoid Valve (ASCo.)
M.5-1 (32)	Solenoid Valve (ASCo.)
M.5-2 (2)	Limit Switch (NAMCO EA-740)
M.5-2 (10)	Solenoid Valve (ASCo.)

B. The following equipment has existing EQ documentation which will be augmented by analysis to provide conformance with NUREG-0588 Cat. II.

Table and Item Number	Equipment Name
M.5-1 (28)	Hydrogen Recombiner (Atomic International)
M.5-1 (8)	(Cerro/Rockbestos) Instrumentation Cable
M.5-1 (19)	H_2-O_2 Analyzer Panel (Delphi)
M.5-1 ( )	Selector Switch (GE)
M.5-1 ( )	Control Swtich (GE)
M.5-1 (13)	Flow Transmitter (Hays)
M.5-1 (23)	Damper Motor (ITT General Controls, Series AH 90)
M.5-1 (6)	Medium Voltage Cable (Korite)
M.5-1 (2)	480V Motor Control Centers (Klockner-Moeller)
M.5-1 (41)	Valve Motor Operator (Limitorque SMB-0)
M.5-1 (41)	Valve Motor Operator (Limitorque SMB-00)
M.5-1 (41)	Valve Motor Operator (Limitorque SMB-000)
M.5-1 (41)	Valve Motor Operator (Limitorque SMB-1)
M.5-1 (41)	Valve Motor Operator (Limitorque SMB-3)
M.5-1 (41)	Valve Motor Operator (Limitorque SMB-4)
M.5-1 (16)	Flow Controller (Love Controls, 54-8115 series)

B. (Cont.)

Table and Item Number	Equipment Name
M.5-1 (37)	Limit Switch (NAMCO-EA-170)
M.5-1 (7)	Low Voltage Power and Control Cable (Okonite)
M.5-1 (10)	Instrumentation Cable (Raychem)
M.5-1 (27)	Pump motor (Reliance)
M.5-1 (24)	Fan motor (Reliance)
M.5-1 (9)	Instrumentation Cable (Samuel Moore)
M.5-1 (18)	Control Panel (System Control)
M.5-1 (3)	DC Motor Control Center (System Control)
M.5-1 ( )	Temperature switch (United Electric)
M.5-1 (33)	Solenoid Valve (Valcor V526-592 series)
M.5-1 (33)	Solenoid Valve (Valcor V526-5294 series)
M.5-1 (33)	Solenoid Valve (Valcor V526-5760 series)
M.5-1 (33)	Solenoid Valve (Valcor V526-5292 series)
M.5-1 (33)	Solenoid Valve (Valcor V526-5880 series)
M.5-1 (14)	Thermocouple (Weed Type E)
M.5-1 (15	RTD (Weed 611)
M.5-1 (21 & 22)	Fan Motor (Westinghouse)
M.5-2 (9)	Pressure Transmitter (Bailey 556)
M.5-2 (3)	Pressure Switch (Barksdale B1 T series)

B. (Cont.)

Table and Item Number	Equipment Name
M.5-1 (37)	Soleniod Valve (ASCo. WPHV-206-381 series)
M.5-2 (21)	Diff. Press/Switch (Barton 288)
M.5-2 (5)	Press. Switch (Barton 288A)
M.5-2 (22)	Diff. Press. Swtich (Barton 289)
M.5-2 (7)	Level Switch (Barton 760)
M.5-2 (1)	SRV Solenoid (Crosby)
M.5-2 (18)	Sensor Converter (GE)
M.5-2 (11)	Level Switch (Magnetrol)
M.5-2 ( )	Press. Switch (Robert Shaw, SP-222-C)
M.5-2 ( )	Diff. Press. Transmitter (Statham Inst.)
M.5-2 ( )	Press Switch (Static "O" Ring, 12N series)
M.5-2 ( )	Aux Turbine Controls (Terry Turbine)
M.5-2 ( )	Temp. Switch (Fenwal)
M.5-2 (6)	Level Indicating Switch (Yarway)

C. The following equipment has insufficient documentation to demonstrate compliance with Category II requirements of NUREG 0588 and is undergoing EQ testing:

Table and Item Number	Equipment Name
M.5-1 ( )	Limit Switch (Namco EQ-700)
M.5-1 (29 & 30)	Solenoid Valve (ASCo. 8342)
M.5-1 (26)	Electric Heating Coil (CVI)
M.5-1 (45)	Radiation Detector (General Atomics)

C. (Cont.)

Table and Item Number	Equipment Name
M.5-1 (1)	MV Switchgear (Gould/ITE)
M.5-1 (35)	Limit Switch (GPE Controls)
M.5-1 (16)	RTD/I Converter (Love Controls, 541-8114 series)
M.5-1 (17)	Relay (Love Controls)
M.5-1 (20)	Power Supply Cabinet (System Control)
M.5-1 ( )	Unit 2 Electrical Penetrations (Amphenol)
M.5-2 (34)	Pressure Swtich (Barksdale D2 H series)
M.5-2 (24)	Pressure Switch (Barksdale P1H series)
M.5-2 ( )	Temp. Element (PYCO, Type E)
M.5-2 ( )	Control Valve (Conax)
M.5-2 ( )	Solenoid Valve (GE)
M.5-2 (17)	Radiation Detector (GE)
M.5-2 ( )	Power Range Detector (GE)
M.5-2 (15)	Detector (GE)
M.5-2 ( )	NSIV-LCS Local Panel (GE)
M.5-2 ( )	SRM & IRM Pre Amps (GE)
M.5-2 ( )	Local Racks and Panesl (GE)
M.5-2 (12)	Pump Motor (GE)
M.5-2 ( )	Pump Motors (GE-5k63xx)
M.5-2 ( )	HCU (GE)
M.5-2 ( )	Voltage Preamp (GE)

C. (Cont.)

Table and Item Number	Equipment Name
M.5-2 ( )	Solenoid Valves (ITT Hammel-Dahl)
M.5-2 ( )	Temp Element (PYCo.)
M.5-2 (8)	Diff. Press. Transmitter (Rosemont, 1151 DP)
M.5-2 (16)	Diff. Press. Transmitter (Rosemont, 1151 GP)
M.5-2 ( )	Pressure Switch (Static "O" Ring, 6N & 5N Series)
M.5-2 ( )	Flow Meter (S&K Instruments)
M.5-2 ( )	Temp. Element (Fenwal)

The conclusions evident from this comparison to NUREG 0588 Category II requirements are as follows:

a. All Class IE equipment located in a harsh environment is environmentally qualified with documented records, or is being qualified by analysis using existing EQ testing information (if necessary) or is undergoing EQ testing.

b. The only exception is the change out of certain limit switches to a qualified model.

EQ analyses necesary to meet Category II requirements of NUREG 0588 are being prepared at this item by Wyle Laboratories. This work will be completed by July 1, 1981. Wyle is also currently preparing EQ test plans for all Class IE equipment not qualified by analysis. The test plans currently being prepared will be completed in groups with the final group completed by October 1, 1981. Actual testing will begin in mid May 1981 and conclude by May 1, 1982. Qualification Program completion is scheduled for June 30, 1982.

ENVIRONMENTAL QUALIFICATION OF EQUIPMENT

1) All LRG plants have received CP SER's prior to July, 1974 and as such will perform the environmental qualification review in accordance with the DOR guidelines (DOR Memo 22, Dec., 5, 1979).

2) The lead LRG plant (LSCS) will complete and docket the review of all safety-related electrical equipment subject to a harsh environment (IE Bulletin 79-01B) by November 1, 1980 or 8 weeks prior to fuel loading whichever is later.

3) All remaining LRG plants will docket the information addressed in item 2 above no later than 4 months prior to unit fuel loading.

NOTE:

1) LSCS-1 intends to complete and docket the evaluation of the environmental qualification of all other Class 1E equipment by June 1, 1981 or the date of full power operation whichever is earlier. The remaining LRG plants will docket the results of a comparable evaluation no later than 4 months prior to full power operation.

2) The applicants intend to complete the requalification or replacement of safety related electrical equipment subject to a "harsh environment" (to the extent replacement or requalification is both necessary and practicable) by June 30, 1982.
