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March 27, 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  
Supplemental Information in Response  
to NUREG-0519 Open Items  
NRC Docket Nos. 50-373/374

References (1): L. O. DelGeorge letter to B. J. Youngblood  
dated March 6, 1981

Dear Mr. Youngblood:

The purpose of this letter is to provide supplemental information which addresses the open items defined in Section 1.8 of the LaSalle County Safety Evaluation Report (SER), NUREG-0519. Each of these items with the exception of Item 1 is addressed in an enclosure to this letter. With respect to item 1, the required documentation of conformance to the safety significant regulations was submitted in Reference 1.

If you have any questions on the attached materials, please direct them to this office.

Very truly yours,

L. O. DelGeorge  
Nuclear Licensing Administrator

Enclosure

cc: NRC Resident Inspector - LSOS

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Enclosure 1

Item 2. Small Pipe Visual Inspection During Preoperational Tests  
(3.9.2.1)

Commonwealth Edison has reviewed the additional surveillance recommended by the NRC Staff and with one exception will perform the inspection proposed. A detailed discussion of our planned inspections is presented below.

1. Reactor pressure vessel level indicator instrumentation lines

A visual inspection of vessel level and pressure instrumentation lines will be made in conjunction with Startup Test Procedure (STP) 34, "Vibration Measurements." The visual inspection will be conducted to identify any excessive vibration that could result in fatigue failure.

2. Main Steam instrumentation lines for monitoring main steam flow

Although Commonwealth Edison has evaluated the performance of this test, it is judged to be impracticable and, therefore, a commitment can not be made.

(a) A meaningful test can not be performed without steam flow. The environmental conditions including temperature and radiation make it impossible for this test to be performed visually.

(b) Instrumentation of the subject lines can not be achieved without jeopardizing existing test schedules. In this regard, it should be clearly understood that this system was never under consideration for vibration monitoring under Preoperational Procedure 14.2-45 or Startup Test Procedure 14.2-130. In fact, the NRC did not raise the possibility of monitoring this additional system until February, 1981, notwithstanding the acceptance by the Staff of the proposed testing in 1979.

Furthermore since the instrument lines in question provide input to dp transmitters, were a failure to occur, the resulting hi-dp signal would result in a vessel isolation which is an analyzed transient not limiting to the plant design.

For these reasons, it is judged that this test need not be performed, due both to the fact that it does not add to the safe operation of the plant, and its addition at this time imposes an undue burden.

3. Reactor Core Isolation Cooling Lines on the RCIC steam line outside containment.

The requested visual inspection of these lines to identify any excessive vibration is currently planned as a part of the Drywell Piping Vibration Test (see Table 14.2-136).

4. Control Rod Drive (CRD) lines inside containment

The requested visual inspection to identify any excessive vibration will be performed for all CRD withdraw and insert lines inside containment in conjunction with Startup Test Procedure 34, "Vibration Measurements".

## Enclosure 2

### Item 3. Dynamic Qualification (3.10)

All safety-related equipment covered by the SQRT program were covered by an extensive dynamic qualification program. This complex program included many activities that may be summarized as follows:

1. Comprehensive evaluations for the original seismic qualifications in view of the new acceptance criteria based on:
  - a. All new loading combinations (including LOCA and pool dynamic loads).
  - b. U.S. NRC Regulatory Guide 1.92
  - c. IEEE 345-1975
  - d. U.S. NRC Regulatory Guide 1.100
  - e. U.S. NRC SRP -3.9.3 and 3.10
2. Regualification efforts, using testing, analysis or both, to demonstrate the adequacy of equipment for which the original seismic qualifications did not meet the requirements of the new acceptance criteria.
3. Hardware design modifications for equipment which failed to meet the requirements of the new acceptance criteria.
4. Replacement of equipment which cannot be modified to meet the new acceptance criteria (this happened only in one case).

### Evaluation Results

The evaluation process was completed a year ago and all pieces of equipment for which the qualification did not meet the new criteria were identified. A study was made to categorize areas of deficiency and develop a plan of attack to address these deficiencies.

### Regualification Efforts

1. Analysis
  - a. 300 reports were revised to include the new loads. This work has been completed.
  - b. 30 reports including new detailed dynamic analyses for all new requirements were completed.

- c. Fatigue evaluation for LPCS pump and the RHR Heat Exchanger was conducted for the extended duration of the pool dynamic loads and completed.
- d. A valve flexibility study to justify all amplification factors used in the qualification is in progress.

## II. Testing

### a. Laboratory Tests

Complete new qualification tests were (and are being) conducted for 17 pieces of equipment (mainly electric) and 30 pieces of instrumentation equipment.

### b. In-Plant Testing

- i) Impedance testing was completed for 16 pieces of equipment mounted on pipes and on the floor. The evaluation of the data is in progress.
- ii) SRV testing - 5 floor mounted equipment plus few pipe mounted equipment will be monitored during the test.

### Design Modification

A number of design modifications were required and implemented in the cases of four valves, hydrogen recombiner and numerous HVAC hangers to reduce the severity of the input to dampers. A few additional modifications are being studied but are not finalized yet.

### Equipment Replacement

Certain sub-components of the RCIC pump turbine have been replaced. This is the only case to be reported at the present time, but this option is still available if needed for use in the future.

### STATUS

95% of BOP equipment qualifications are completed. The 5% remaining is in progress and scheduled to be completed by the end of May, 1981; except for valve operators which may extend to June 1981. 80% of NSSS equipment qualifications are completed. The 20% remaining is in progress and will be completed by May 1981 except valve operators which may be extended to June 1981.

### Conclusions

All equipment will be qualified to meet the new acceptance criteria by June 1981.



Our equipment qualification demonstrates structural integrity, functionability and operability.

Our equipment qualifications has the following built in conservatism and/or margins:

- a) use of low damping values (1% & 2%)
- b) use of radial resultant of the pool dynamic loads in both horizontal directions
- c) use of response spectrum curves in lieu of time histories
- d) use of peak broadened response spectrum curves for all dynamic loads.

### Enclosure 3

#### Item 4 Environmental Qualification (3.11)

Commonwealth Edison has identified the electrical equipment at LaSalle Station Units 1 and 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 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" if the equipment must not function or interact deleteriously with safety equipment.

A review of all LaSalle County Station safety-related electrical equipment in harsh environments was completed against the DOR Guidelines (Guidelines for Environmental Qualification of Class IE Electrical Equipment in Operating Reactors), and was submitted to the NRC Staff on October 31, 1980.

The results of this review showed that approximately 85% of items in harsh environments were qualified to the DOR Guidelines, approximately 10% were awaiting documentation and approximately 5% were undergoing E.Q. testing.

The conclusions evident from this original comparison to DOR Guidelines were as follows:

- a. All Class IE equipment was environmentally qualified with documented records, or was qualified but written reports were still being assembled, or the devices were undergoing E.Q. testing.
- b. The only exception was the change out of a limit switch to obtain a suitable qualified model.

Based on the results of the E.Q. comparison to DOR Guidelines, a plant systems review was made for all systems employing Class 1E devices whose E.Q. documentation was not completed. This systems review would conclude that the required plant safety functions were invalidated by failure of any individual item on this incomplete documentation list. The bases included the following: functional time analysis, similarity analysis, knowledge of test results not yet in report format, and comparison analyses.

Subsequent to this original evaluation against the DOR Guidelines, but prior to the NRC Staff directive of February 13, 1981 to perform the review to NUREG-0588, Commonwealth Edison contracted Wyle Laboratories to upgrade the environmental qualification of Class 1E equipment at La Salle County to the Category II requirements of NUREG-0588 "Interim Staff Position on Environment Qualification of Safety-Related Electrical Equipment".

The current expanded program is designed to reevaluate the previously identified items and through analyses using existing test documentation or through new testing achieve full qualification status to NUREG-0588 (Category II) requirements.

Plant environments have been tabulated for equipment locations. These environments have been grouped into a number of bounding environmental envelopes for the purpose of simplifying the qualification analysis and testing efforts.

Equipment items have been grouped by Manufacturer and Model number into equipment lists; the HARSH environment zone have 88 separate list entries. Ninety-five list entries are associated with NON-HARSH environmental zones.

Extensive data search through environmental qualification reports and records at Wyle Laboratories and other sources plus the vendors engineering record files is nearly completion. Analytical evaluations on aging are underway on 49 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 NUREG-0588 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 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.



Major milestones for LaSalle as documented in the L. O. DelGeorge letter to B. J. Youngblood of March 9, 1981, are as follows:

Initial Submittal to NRC of EQ Report	October 31, 1980
Completion of Evaluation (Analysis)	June 30, 1981
Decision of Last Recommendation	July 31, 1981
Completion of Last Test Series	May 1, 1982
Final Qualification File Completed	June 30, 1982

(Note that the above dates are the completion dates for the final activity of that action category).

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

Combinations or categories of equipment items into test groups based on environmental profiles enable sequential testing with minimum schedule upset. The sequence of testing includes:

- A.) Test Plan (Procedure)
- 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

A meeting with the NRC Staff is scheduled for March 31, 1981 to review the existing LaSalle County environmental qualification records in order to clarify the current status of those records for the Staff. It is hoped that subsequent to this meeting and understanding will have been reached regarding the extent to which docketed qualification summaries require augmentation prior to the Staff initiating its audit of qualification records.

Enclosure 4

Item 5. Fuel Clad Ballooning and Rupture (4.2.3)

General Electric Company is currently completing sensitivity studies which bound NUREG-0630 data. This study, utilizing the CHASTE 05 (fuel heat-up code), is expected to show a maximum peak clad temperature (pct) impact of less than 20°F. No change in maximum average planar heat generation rate (MAPLHGR) is expected.

The NRC Staff has expressed concurrence with this approach as a basis for resolving the fuel ballooning issue for LaSalle County, and any other BWR NTOL plant for which the sensitivity study is representative.

A draft copy of this report is expected to be provided the Staff on March 31, 1981, with the formal documentation of the study targeted for April 2, 1981.

Enclosure 5

Item 6 Compliance with 10 CFR 50 Appendix G(5.3)

The response to this item can be divided into two parts: (1) those requirements stated in the current provisions of 10 CFR 50 Appendix G which can not be met due to the change in code requirements since component purchase, and as such require an exemption from current rules; and (2) full documentation of the bases for conformance to all other provisions to 10 CFR 50 Appendix G.

With regard to the first class, Commonwealth Edison submitted in the L. O. DelGeorge letter to B. J. Youngblood dated February 18, 1981 information addressing RPV materials. This information will be formally documented in FSAR Amendment 56.

With respect to the second class, Commonwealth Edison has initiated the record retrieval and documentation program necessary to confirm that no exceptions are required. It is worth pointing out that the regulations do not demand submittal of this information. The NRC Staff request for this information in February, 1981 is a review ratchet that will be difficult to accommodate quickly. The same personnel are heavily involved in retrieving and summarizing records related to the safety-related equipment environmental qualification and this work currently is assigned the highest priority.

Although we will submit a detailed schedule for completion of the Appendix G work by April 15, 1981, depending upon the depth of reporting required, this program could take as much as 90 days. Your assistance in minimizing unnecessary effort would be greatly appreciated.

Enclosure 6

Item 7. Criterion 51 of the General Design Criteria (6.2.7)

This program, as first discussed with the NRC Staff on February 6, 1981, is scheduled to be completed by April 10, 1981. Therefore, we expect to provide the requested assessment documentation on or before April 15, 1981.



Enclosure 7

Item 8. Review of Independent Inspection of Cable Routing (8.4.6)

In response to the request for a 10% field audit of cable separation contained in Reference (a), and as committed by Commonwealth Edison in Reference (b), the results of the subject cable separation audit are attached. This audit reviewed a sample consisting of approximately 10% of the total installed safety-related cables, associated cables and electrical equipment at LaSalle County Station, Unit 1. Specific cables and equipment selected for audit and the criteria to be used to assess the adequacy of the installed cable and equipment was delineated by the Architect-Engineer, Sargent & Lundy (S&L). The actual audit was performed under the auspices of the Commonwealth Edison Quality Assurance Department with the technical assistance of S&L representatives familiar with electrical design but not involved in the design of LaSalle County Station. The actual audit plan is provided as Attachment E7-1.

The results of the audit were documented in Commonwealth Edison LaSalle County Audit No. 1-80-63, the details of which are on file at the plant site. Included in Attachment E7-2 is a summary of the audit results as well as the engineering evaluation of those results. This attachment is judged to provide the necessary documentation to resolve the subject open item.

References (1): B. J. Youngblood letter to D. L. Peoples dated May 7, 1980.

(2): D. L. Peoples letter to B. J. Youngblood dated May 27, 1980.

Attachment E7-2  
LaSalle County Unit 1  
Separation Audit 1-80-63  
Summary of Results

The audit conducted involved 398 Class 1E cables, and conduit and 384 associated cable and conduit. The audit included a review of these cables for separation and markings as well as related termination requirements; and involved in excess of 10% of the total cables included in the 22 safety-related systems selected for audit.

The audit resulted in 3 findings and 1 observation all of which were determined upon investigation to be of an insignificant nature. These results, the subsequent evaluation performed and subsequent actions taken are provided in LaSalle Q.A. Surveillance Report No. 81-79, 81-94, 81-97 and 81-101 which are attached.

It should be clearly noted that after this very thorough audit only one (1) verified violation of established separation criteria was identified. This isolated deficiency, discussed in greater detail in Surveillance Report No. 81-97 has been corrected. The remaining deficiencies can be broken down into three categories, all effecting cable or conduit marking: (1) correctable deficiencies due to broken, misplaced, illegible or improperly tagged components; (2) apparent deficiencies resolved after engineering review to be within the established design criteria; such as tag location on flexible conduit, associated cable taping and associated cable bundling; and (3) auditor errors reconciled after resurveillance.

The verified deficiencies, being all related to cable marking do not effect the safe operation of the plant. Cumulatively the deficiencies represent a very small percentage of the total sample audited. Augmented QC surveillance prior to system turnover as a part of the final system walkdown which precedes plant startup will identify all other deficiencies of this type. However, resolution of such deficiencies, though expected prior to fuel loading will be accomplished as soon as possible. Because cable marking deficiencies alone do not effect the safe operation of the plant, it is judged that such deficiencies can be remedied after fuel load but prior to full power operation.