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

DEC 07 1978

Docket Nos. 50-373
and 50-374

Mr. Byron Lee, Jr.
Vice President
Commonwealth Edison Company
P. O. Box 767
Chicago, Illinois 60690

Dear Mr. Lee:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR LA SALLE COUNTY STATION, UNITS 1 & 2

In our submittal dated October 5, 1978, we requested additional information in the area of instrumentation and control systems and mechanical engineering. Subsequently, we had a telephone conversation with your personnel with respect to Question 111.74. During that telephone conversation it was agreed that we would clarify the information which we require. The Enclosure to this letter provides that clarification.

Please contact us if you desire further discussions.

Sincerely,

Olan D. Parr, Chief
Light Water Reactors Branch No. 3
Division of Project Management

Enclosure:
As stated

cc w/enclosure:
Richard E. Powell, Esq.
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One First National Plaza
Suite 2400
Chicago, Illinois 60670

7812150168

ENCLOSURE

110.0 MECHANICAL ENGINEERING BRANCH

111.7 (3.10) (3.9.2.2)

A review of the design adequacy of your safety-related electrical and mechanical equipment under seismic and hydrodynamic loadings will be performed by our Seismic Qualification Review Team (SQRT). A site visit at some future date will be necessary to inspect and otherwise evaluate selected equipment after our review of the following requested information. The SQRT effort will be primarily focused on two subjects. The first is the adequacy of the original single-axis, single-frequency tests or analyses of equipment qualified per the criteria of IEEE Std. 344-1971. The second subject is the qualification of equipment for the combined seismic and hydrodynamic vibratory loadings. The frequency of this vibration may exceed 33 hertz and negate the original assumption of a component's rigidity in some cases.

Attached Appendix 111-1 describes the SQRT and its procedures. Section V.2.A requires information which you should submit so that SQRT can perform its review.

Your have stated in your Closure Report that equipment will be qualified for the SRSS combination of the hydrodynamic and seismic required response spectra (RRS). Similarly, when qualified by analysis, the peak dynamic responses of the equipment to the hydrodynamic and seismic loads will be combined by SRSS. The combining by SRSS of either the RRS or peak dynamic responses for hydrodynamic and seismic loadings is not acceptable at this time.

To aid the staff in its review, provide a compilation of the required response spectra listed below for each floor of the seismic Category I buildings at your plant.

(1) the RRS for the OBE or SSE, whichever is controlling. If the OBE is controlling, explain why.

(2) the controlling hydrodynamic RRS

(3) items (1) and (2) combined by SRSS

(4) items (1) and (2) combined by absolute sum.

Appendix 110-1

SEISMIC QUALIFICATION REVIEW TEAM (SQRT)

Interim Procedures

I. SCOPE

SQRT tasks include both generic and site specific reviews. Generic reviews cover equipment supplied by the NSSS and A/E common to more than one plant. Specific plant reviews as delineated in the Standard Review Plan Sections 3.9.2 and 3.10 will be supplemented by SQRT site visits and evaluation.

II. OBJECTIVES

SQRT is a group of NRC staff members established to conduct reviews of the design adequacy of safety-related mechanical components, instrumentation and control equipment, and their supporting structures for various vibratory loads. SQRT is charged with accomplishing the following three tasks.

1. Determine the design adequacy of mechanical and electrical components and their supports for the required vibratory loading conditions which include:

   (a) Seismic

   (b) hydrodynamic (as applicable)

   (c) explosive (as applicable)

   (d) other vibratory inputs from the operating environment (as applicable)

   (e) appropriate combinations of the above events.

2. Changes in seismic qualification criteria, such as the revision of IEEE Std. 344 and other IEEE Standards, and the issuance of Regulatory Guides 1.100 and 1.89 require that the staff verify:
   (a) For older plants having components qualified by previous criteria; that components have adequate margin to perform their intended design functions during and after a seismic event.
   (b) For new plant applications; that there has been uniformity and consistency in implementing the current criteria.
3. In the case of plants which have design basis seismic ground motion levels and/or other required vibratory loads increased, review to assure adequate design margin exists at the revised levels.

III. GENERAL CRITERIA

The bases used by the staff to determine the acceptability of equipment qualification will be IEEE Std. 344-1975 as supplemented by Regulatory Guides 1.100 and 1.92, and Standard Review Plan Sections 3.9.2 and 3.10.

IV. GENERAL PROCEDURES

SQRT will conduct generic and plant specific reviews:

1. Generic reviews will be conducted of all NSSS vendors and most architect engineers (major equipment vendors and testing laboratories may be included if necessary) to assure proper interpretation and implementation of the current equipment qualification criteria applied

to plants applying for construction permits and operating licenses.

2. A plant specific equipment qualification review will be conducted of each plant now undergoing licensing review having components qualified to criteria different from current requirements.

   A. For components having multi-plant application (such as those within the scope of an NSSS vendor), an equipment qualification review at specific sites will provide generic qualifications.

   B. For components which have only specific plant application (mostly those within the scope of the BOP supply), an equipment qualification review at specific sites will provide site-specific qualifications.

3. Equipment qualification review for plants with revised increased design basis seismic ground motion levels and/or other required vibratory loads will be conducted on a plant by plant basis.

V. SPECIFIC PROCEDURES

SQRT procedures provide for both generic discussion meetings and plant site visits.

1. Generic Discussion Meeting:

   To implement the generic review specified in IV.1 and IV.2.A, a generic discussion meeting will be held to discuss the following:

   A. Meeting Agenda

      Meeting Objectives by SQRT

B. NSSS or A/E personnel should be prepared to present the following information:

(1) A detailed description of current practice followed in equipment qualification, including acceptance criteria, methods, and procedures used in conducting testing and analysis. Present and discuss the equipment qualification program on certain specified items (i.e., pumps, valves, diesel generators, motors, bistable units, relays, electrical cabinets, etc.)

(2) Information regarding administrative control of equipment qualification, especially the handling of interface problems, documentation, and internal review procedures.

(3) Identifying the scope of their suppliers. A list of equipment should be made available if possible prior to the meeting.

C. For the cases specified in IV.2.A, methods and procedures for conducting equipment qualification review are discussed, including selection of plants for site visits and setting up a tentative schedule for such visits.

D. Discuss necessary documentation.

E. Inspect testing facilities, if any. Testing capability, format of testing reports, wave forms of shaker table motions, and monitoring and control devices are the major items for inspection.

F. SQRT concludes the meeting and specifies the follow-up items.

2. Plant Site Reviews:

To implement plant specific equipment qualification reviews specified in IV.2 above, on-site inspection of equipment and supporting structures in question is required. Site visits generally follow the following procedures:

A. Pre-visit information submission

The applicant (plant owner) receives initial information concerning the intended visit, and should subsequently submit two summary equipment lists (one for NSSS supplied equipment and one for BOP supplied equipment). These lists should include all safety related mechanical components, instrumentation, and control equipment, including valve actuators and other appurtenances of active pumps and valves. In the lists, the following information should be specified for each item of equipment:

(1) Method of qualification used:

(a) Analysis or test

(b) If by test, describe whether it was a single or multi-frequency test and whether input was single axis or bi-axial

(c) If by analysis, describe whether static or dynamic,

single or multiple-axis analysis was used. Present natural frequency of equipment.

(2) Indicate whether the equipment is required for:

(a) hot stand-by

(b) cold shutdown

(c) both

(d) neither

The scenario to be considered for this determination is:

(i) SSE or OBE, with coincident

(ii) loss of offsite power, and

(iii) assumption of any single active failure.

(3) Location of equipment, i.e., building, elevation.

(4) Availability for inspection (Is the equipment already installed at the plant site?)

(5) Provide a description of how cold shutdown is reached using the equipment in item (2) above.

B. SQRT screens the above information and decides which items will be evaluated during our forthcoming site visit. The applicant

will be informed of these items and will be expected to submit two weeks prior to the visit an equipment qualification summary as shown on pages 10-12 for each of the selected items.

C. A brief meeting is held at the beginning of a site visit with the following agenda:

(1) SQRT explains the objectives of the site visit and procedures to conduct equipment inspection.

(2) Utility personnel or their designees present an overview of the seismic qualification program conducted.

(3) The seismic qualification of certain specified items may be discussed as necessary.

(4) SQRT specifies items that need to be inspected.

D. SQRT conducts inspection of specified items.

E. SQRT describes findings of the inspection.

F. General discussion.

G. SQRT concludes the visit and specifies needed information and the follow-up actions.

3. After each visit SQRT will issue a trip report, which identifies findings, conclusions and follow-up items. Status reports may be issued as necessary. The site review will include the issuance of

an Evaluation Report for the specific plant. Generic evaluations will be referenced to the NSSS vendor or A/E.

VI. RESPONSIBILITIES OF NRC PARTICIPANTS:

A. The Seismic Qualification Review Team consists of members of the Mechanical Engineering Branch (MEB), the Instrumentation and Control Systems Branch (ICSB), and the Power Systems Branch (PSB). One additional member from MEB will join the team when a review of a specific plant is going to be conducted. This member will be the reviewer of the plant.

The Team Leader is responsible for scheduling actions, coordinating staff positions, and contacting appropriate authorities for work assignments to each member. He reports to the MEB Branch Chief regarding the progress of SQRT performance. He will set up necessary contacts for generic reviews and will contact project management for specific plant site visits. He will specify the meeting objectives and concludes meetings.

The MEB members and Team Leader are responsible for reviewing assigned equipment qualifications in the area of responsibility of the Mechanical Engineering Branch, including the methods and procedures used in test and analysis.

Members representing the Power Systems Branch (PSB) and the Instrumentation & Control Systems Branch (ICSB) are responsible for reviewing assigned equipment qualification in the area of responsibility c

their branch, including equipment signal interpretations for functional verification. They serve as a liaison between SQRT and ICSB and PSB.

All members shall present their opinion and professional judgement to the Team Leader in order to arrive at consistent and uniform SQRT positions.

B. The MEB, PSB, and ICSB project reviewers will be advised of SQRT activities which relate to specific plants. The MEB project reviewer is responsible for evaluating the impact of SQRT activity on the specific plant review and for taking appropriate action to include pertinent information in the plant safety evaluation. The MEB project reviewer is expected to participate in the site visit and attend pertinent generic meetings as necessary.

The DPM project manager, after being informed of the intended plant visit, is expected to contact the applicant and arrange for the visit. The project manager serves as a liaison between the SQRT and the applicant.

C. Generic meetings will be arranged by the SQRT or via the DPM generic project manager if one is assigned.

D. Representatives from I&E Regional Offices and other interested organizational groups within NRC are welcome to attend either generic meetings or plant site visits as observers. The SQRT should be informed of expected attendance at such meetings or site visits.

Qualification Summary of Equipment

I. Plant Name: _____ Type:

1. Utility: _____ PWR _____
2. NSSS: _____ BWR _____
3. A-E: _____

II. Component Name _____

1. Model Number _____ Quantity: _____
2. Vendor _____
3. If the component is a cabinet or panel, name and model No. of the devices included: _____
4. Physical Description a. Appearance _____

   b. Dimensions _____

   c. Weight _____
5. Location: Building: _____

   Elevation: _____
6. Field Mounting Conditions [ ] Bolt (No. ____, Size ____)
   [ ] Weld (Length ____)
   [ ] _____
7. Natural Frequencies in Each Direction: _____

   h1: _____ h2: _____ V: _____
8. a. Functional Description: _____

   _____

   b. Is the equipment required for [ ] Hot Standby [ ] Cold Shutdow

   [ ] Both
9. Pertinent Reference Design Specifications: _____

   _____

III. Is Equipment Available for Inspection in the Plant: [ ] Yes [ ] No

Comments: _____

_____

IV. Equipment Qualification Method: Test: _____

Analysis: _____

Combination of Test and Analysis: _____

Test and/or Analysis by _____
(name of Company or Laboratory & Report No.)

Vibration Input:

1. Loads considered 1.[ ] Seismic only 2.[ ] Hydrodynamic only 3.[ ] Explosive only
4.[ ] Other (Specify)_____ 5.[ ] Combination of_____

2. Required Response Spectra (attach the graphs):

_____

3. Required Acceleration in Each Direction:

h1 = _____ h2 = _____ V = _____

VI. If Qualification by Test, then Complete:

1. [ ] Single Frequency [ ] Multi-Frequency
2. [ ] Single Axis [ ] Multi-Axis
3. Frequency Range: _____
4. TRS enveloping RRS using Multi-Frequency Test [ ] Yes (Attach TRS graphs) [ ] No
5. g-level Test at h1 = _____ h2 = _____ V = _____
6. Laboratory Mounting:
   1. [ ] Bolt (No.____, Size____) [ ] Weld (Length____) [ ]_____
7. Functional operability verified: [ ] Yes [ ] No [ ] Not Applicable
8. Other tests performed (such as fragility test, including results)_____

_____

VII. If Qualification by Analysis or by the Combination of Test and Analysis, then Complete:

1. Description of Test including Results: _____

_____

2. Method of Analysis:

[ ] Static Analysis [ ] Equivalent Static Analysis [ ] Dynamic Analysis

[ ] Response Spectrum [ ] Time-History

3. Model Type: [ ] 3D [ ] 2D [ ] 1D

[ ] Finite Element [ ] Beam [ ] Closed Form Solution

4. [ ] Computer Codes: _____

Frequency Range and No. of modes considered: _____

[ ] Hand Calculations

5. Damping: _____

6. Support Considerations in the model: _____

7. Critical Structural Elements:

A.

Identification	Location	Governing Response Combination	Seismic Stress	Total Stress	Stress Allowabl

B.

Max. Deflection	Location	Effect Upon Functional Operability