

February 18, 1994

Mr. Ross P. Barkhurst
Vice President Operations
Entergy Operations, Inc.
Post Office Box B
Killona, Louisiana 70066

Dear Mr. Barkhurst:

SUBJECT: SITE VISIT TO GATHER ENVIRONMENT QUALIFICATION (EQ) INFORMATION AT WATERFORD STEAM ELECTRIC STATION, UNIT 3 (WATERFORD 3)

The Nuclear Regulatory Commission (NRC), Office of Nuclear Reactor Regulation (NRR), plans to visit a number of nuclear power plants in order to gather information on environmental qualification (EQ) and to learn about any difficulties that are being experienced or initiatives that are being taken in this area. The purpose of this letter is to inform you that the NRC staff will perform this EQ review at Waterford 3 nuclear plant during the week of May 23, 1994. The lead reviewer for this activity will be Christopher Gratton (NRR), and he will be assisted by Ann Dummer and Chris Rourke (NRR) and Frank Quinn (NRC contractor). I have enclosed the staff's review plan for your information, and I will be in contact with your staff to discuss the plan details such as scheduling the entrance meeting, initial presentations, access to documentation and site personnel, etc. If you should have any questions regarding this effort, please contact me at (301) 504-1301, or contact Christopher Gratton at 301-504-1055.

Sincerely,

ORIGINAL SIGNED BY:

David L. Wigginton, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

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Enclosure:
As stated

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NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555-0001

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Vice President Operations
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Sincerely,

A handwritten signature in cursive script, appearing to read "D. Wigginton".

David L. Wigginton, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
See next page

Mr. Ross P. Barkhurst
Entergy Operations, Inc.

Waterford 3

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STAFF PLAN FOR GATHERING EQUIPMENT QUALIFICATION (EQ)
INFORMATION AT SELECTED NUCLEAR POWER PLANTS

BACKGROUND INFORMATION

As a result of the staff's activities related to license renewal, EQ was identified as an area that required further review. A major concern in this regard was whether the EQ requirements for older plants (i.e., those with EQ programs developed under DOR Guidelines or NUREG-0588, Category II, requirements) were adequate to support license renewal. Consequently, the staff concluded that differences in EQ requirements between older and newer plants constituted a potential generic issue which should be evaluated for backfit independent of license renewal activities.

In support of the license renewal initiative, EQ testing of electric cables was performed by Sandia National Laboratories (SNL). Some tests were performed to determine the effects of aging on typical electric cable products used in nuclear power plants. In addition, other SNL tests (unrelated to license renewal) were performed to assess the functionality of damaged electric cables during loss-of-coolant accident conditions. After accelerated aging, some of the environmentally qualified cables either failed or exhibited marginal insulation resistance during accident simulation, indicating that qualification of some electric cables may be non-conservative. Depending on the specific application, failure of electric cables during or following design-basis events could compromise the ability of safety-related equipment to function. While some of the SNL tests may have been more severe than required by NRC regulations, the test results raise questions with respect to the environmental qualification and accident performance capability of certain artificially aged equipment.

Separate from the activities supporting license renewal and in response to issues that were raised by the Office of the Inspector General (OIG) in a report dated August 12, 1992, the NRC staff conducted an assessment of fire protection requirements. The staff's report dated February 27, 1993, identified a number of weaknesses and made specific recommendations for improving the NRC fire protection program. In view of the weaknesses that were identified relative to the NRC fire protection program, the staff concluded that other NRC programs such as EQ should also be reviewed to identify and correct any programmatic weaknesses that may exist.

Consequently, the NRC has determined that focused staff and management attention are necessary to identify and fully address EQ concerns, and a Task Action Plan (TAP) has been developed to coordinate the staff's efforts in this regard. Among other things, the objectives of the EQ-TAP are to: (1) evaluate the differences that currently exist in EQ requirements between older and newer plants, (2) assess the adequacy of accelerated aging practices that are currently used for demonstrating equipment qualification; and (3) perform a programmatic review of EQ requirements to identify and resolve any other EQ

issues that may exist. The EQ-TAP also includes provisions for reviewing licensee implementation practices with regard to EQ programs, collecting information on EQ equipment operating experience, documenting EQ equipment replacement experience, and collecting information on licensee efforts with regard to condition monitoring methods.

This site visit plan has been developed to gather the information necessary to complete EQ-TAP.

OBJECTIVE

The objective of this plan is to gather EQ-related information necessary to support the objectives of the EQ-TAP; namely, evaluate the differences between plants licensed under older EQ requirements versus newer EQ requirements, assess the adequacy of accelerated aging practices that are currently used for demonstrating equipment qualification, and perform a programmatic review of EQ requirements to identify and resolve any other EQ issues that may exist.

Information will also be gathered to support other parts of the EQ-TAP plan, such as identifying condition monitoring methods used by the licensee, if any, and documenting EQ equipment operating experience, including any difficulties that licensees are having with qualified equipment.

REVIEW PLAN

1. Scope

The staff's review will focus primarily on gathering information and data pertaining to EQ equipment, including EQ parameters, assumptions, and requirements, methods being used to manage the effects of aging, condition monitoring techniques being used, and equipment maintenance and replacement information. The team will coordinate its efforts with the licensee in gathering this information by reviewing pertinent records and documents, and through discussions with plant personnel. If possible, EQ equipment will be examined in accessible areas throughout the plant.

The purpose of this review is to gather information, not to assess licensee compliance with NRC regulations. However, should compliance and/or safety issues be identified by the team, they will be discussed with the Resident staff and referred to the appropriate Region for follow-up action.

2. References

- a. 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants"
- b. Reg Guide 1.89 (Rev. 1), "Environmental Qualification of Certain Electrical Equipment Important to Safety for Nuclear Power Plants," June 1984

- c. NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," December, 1979
- d. DOR Guidelines, "Guidelines for Evaluating Environmental Qualification of Class IE Electrical Equipment in Operating Reactors," as promulgated in a Supplement to IE Bulletin 79-01B, January 1980
- e. IEEE Standard 323-71, "IEEE Trial Use Standard: General Guide for Qualifying Class I Electrical Equipment for Nuclear Power Generating Stations," April 1971
- f. IEEE Standard 323-74, "IEEE Standard for Qualifying Class IE Equipment for Nuclear Power Generating Stations," February 28, 1974
- g. Environmental Qualification Task Action Plan, June 16, 1993
- h. Environmental Qualification Safety Evaluation Report (SER) for the facility being reviewed
- i. EQ Inspection Report(s) for the facility being reviewed
- j. EQ Master List for the facility being reviewed
- k. Updated Final Safety Analysis Report for the facility being reviewed (i.e., plant description and EQ-related information)

3. Plant Selection Considerations

Facilities will be selected for this review based on plant vintage, reactor type, and containment design. The goal is to perform this review at a range of facility types involving different licensees.

4. Team Composition

The review team will consist of the following members as a minimum:

- a. Team Leader - A headquarters based reviewer who is familiar with EQ requirements in general and who is cognizant of the EQ task action plan.
- b. Equipment Qualification Specialist - NRC employee or contractor knowledgeable of EQ testing, analysis, and documentation requirements.
- c. Technical Specialist - NRC employee or contractor knowledgeable about the application and operation of electrical power and control equipment requiring EQ.

5. Preliminary Tasks

The following tasks should be completed in advance of the site visit:

a. Document Review

Prior to commencing the on-site review, team members should become familiar with the references listed in Section 2 of this review plan, along with any EQ-related licensee event reports (LERs) for the facility.

b. Team Member Assignments

In addition to the specific responsibilities discussed below, the team leader will be responsible for coordinating the activities of the team, conducting the entrance and exit meeting with the licensee, and resolving any problems that may arise. The team leader shall be the focal point for communications between the team and licensee management, and he/she shall keep the Resident staff, the NRR Project Manager, Plant Systems Branch (SPLB) supervision/management, and the licensee informed of the team's progress and of any significant findings that are identified.

The responsibilities for gathering information during the on-site review will be divided among the team members as indicated below. However, it will be necessary for team members to coordinate their efforts and to share information in order to facilitate the comparison and correlation of data. For example, replacement records for equipment should be compared with the equipment's qualified life; and the actual service environment of equipment should be compared with the environment used during qualification.

The following specific tasks shall be completed by the team members:

Team Leader - Responsible for gathering information by discussing EQ topics with members of the licensee's staff (see Section 6 of this plan for more detail).

EQ and Technical Specialists - Responsible for gathering information by reviewing EQ records and data (see Section 6 of this plan for more detail).

c. Licensee Contact

Since this review is not compliance oriented, every effort should be made to inform the licensee of the team's plans well in advance of the site visit. Coordination of this activity with the licensee may require several conference calls. At least three weeks prior to commencing the on-site review, the team leader should make the necessary arrangements

through the NRR Project Manager to discuss the following details with the licensee:

- Purpose and scope of the review.
- Documents to be reviewed, such as:
 - EQ Master List
 - procedures applicable to EQ (e.g., EQ program requirements; and procedures for procurement, maintenance, modification, and replacement of EQ equipment)
 - qualification documentation and files (for planning purposes, ask that the licensee send a copy of the Table of Contents for each qualification binder)
 - EQ-related LERs applicable to the facility
- Licensee presentations following the entrance meeting covering:
 - organization chart showing EQ hierarchy
 - overview of the EQ program,
 - training provided to management, design, maintenance, engineering, procurement, storage, operations, and quality assurance/quality control (QA/QC) personnel on the EQ program,
 - EQ documentation file organization,
 - EQ equipment that is most risk-significant, and
 - any other points that may be relevant/helpful.
- Site access/badging arrangements.
- Licensee "point of contact" for the team.
- Arrangements for a plant tour directed at EQ areas of the plant.
- Other matters, as appropriate.

6. Review Activities

a. Entrance Meeting

During the entrance meeting, the team leader will introduce the team members and describe the purpose and scope of the EQ review, and generally discuss the details of the review and other matters such as site access considerations and office accommodations. At this time, the

licensee should introduce key individuals who will be working with the team and identify a contact who will be available to assist the team during the review.

b. Licensee Presentations

Following the entrance meeting, the licensee should begin the presentations that were requested by the team, including:

- organization chart showing EQ hierarchy
- overview of the EQ program
- training provided to management, design, maintenance, engineering, procurement, storage, operations, and QA/QC personnel on the EQ program
- EQ documentation file organization
- EQ equipment that is most risk-significant, and
- any other points that may be relevant/helpful.

c. Plant Tour

At the conclusion of the presentations, the licensee should provide a brief tour of the plant, focusing on areas where EQ equipment is located and areas where EQ documentation is maintained.

d. Documentation Review

The team members will coordinate their review and information gathering activities so as to minimize the burden on the licensee. The team will review EQ equipment binders, maintenance and replacement records, and other sources to gather information on the following topics:

- Qualification Report Numbers
- Qualification Temperatures
- Equipment Service Environment
- Estimated Qualified Life
- Qualification Criteria (DOR Guidelines, NUREG-0588 Cat.I or Cat.II)
- Qualified Equipment Upgrades
- Root Causes for EQ Equipment Failures
- Programs to manage aging and/or to monitor the in-service condition of qualified equipment

This list of topics is not intended to be exhaustive. The team may identify additional information to be gathered as deemed necessary.

e. Discussions with Plant Personnel

Discuss EQ topics with members of the licensee's staff who are directly responsible for implementing and maintaining the EQ program requirements for the facility. The discussions should also include the NRC Resident staff and licensee engineering, maintenance, operations, and other personnel who may have some interface responsibilities for implementing and maintaining equipment qualification. Try to ascertain how the EQ program is functioning at the site and whether any problems in particular are being experienced with qualified equipment, such as frequently required maintenance or premature failure. Document the results of these discussions, noting any strengths, weaknesses, and problem areas that are identified. Follow-up the discussions by performing additional review of EQ and maintenance records as necessary.

7. Review Schedule

The team will be on site each day during the facility's normal working hours and will meet daily to discuss the progress of the review and to discuss the results of individual review activities. Each team member shall be responsible for completing his/her assigned activities, and any schedular problems should be discussed with the team leader so that adjustments can be made as appropriate. The team leader will communicate any significant findings or concerns to the Resident staff, SPLB supervision/management, the NRR project manager, and the licensee in a timely manner (typically within a day of discovery).

Typical Site Review Schedule:

Day 1: Travel to site
Conduct entrance meeting
Licensee presentations
Plant tour
Begin discussions and document review.

Day 2-3: Continue review activities.

Day 4: Conduct exit meeting with the licensee and the resident inspector.

During the course of the review, it is expected that the team leader will keep the Resident staff, SPLB supervision/management, the NRR project manager, and the licensee informed of the team's progress, significant findings and concerns, and general impressions. There should be no surprises at the exit meeting.

8. Documentation of Results

The team will write a brief report after each site visit that summarizes its efforts, findings, significant concerns, and conclusions. Each report will be reviewed and approved by the SPLB Branch Chief prior to issuance, and they

will be processed and issued in a manner similar to the issuance of a staff safety evaluation. Specific issues that may require further follow-up action by the Regional staff will be identified in a forwarding memo to the appropriate Project Directorate. The audit report should be issued within two weeks after exiting the site.

TECHNICAL CONTACTS:

George Hubbard (504-2870)
Jim Tatum (504-2805)
Chris Gratton (504-1055)
Ann Dummer (504-2831)