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Central Files

January 7, 1991

MEMORANDUM FOR: John W. Craig, Director
License Renewal Project Directorate
Division of Advanced Reactors
and Special Projects
Office of Nuclear Reactor Regulation

THRU: P.T. Kuo, Section Chief
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FROM: Paul C. Shemanski, Senior Electrical Engineer
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SUBJECT: SUMMARY OF MEETING WITH NUMARC ON EQUIPMENT
QUALIFICATION ISSUES RELATED TO LICENSE RENEWAL

On December 14, 1990, members of the NRR and RES staff met with representatives from NUMARC to discuss equipment qualification (EQ) issues related to license renewal. Prior to the meeting, by letter dated November 14, 1990, the staff provided NUMARC with a request for additional information (RAI) on the Cable In-Containment License Renewal Industry Report. Several major EQ issues identified in the staff RAI were discussed at the December 14, 1990 meeting.

Enclosure 1 is a list of attendees. Enclosure 2 is a list of topics prepared by the staff that were discussed at the meeting. A flow chart used to illustrate key aspects of EQ was also used for the discussion. Each of these topics as discussed during the meeting is summarized below:

EQ as an established effective program - None of the EQ programs currently being implemented by licensees fully satisfy the requirements of an established effective program as defined in draft 10 CFR Part 54. The staff stated that some existing programs will have to be modified to adequately determine the qualification of equipment during the renewal term (after 40 years). For example, the applicant may consider the EQ program required by 10 CFR 50.49 is an established program for selected electrical components. But, for a subset of these components, either extensive additional testing is

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required or a reanalysis (with appropriate justification documented or selected verification testing required, as appropriate) must be performed in order for the EQ program to be applied to the renewal period. See the attached license renewal EQ flow diagram.

Extension of qualified life through reanalysis for license renewal -
The staff discussed four acceptable methods of qualification as described in 10 CFR 50.49(f). NUMARC however, discussed IEEE Standard 323-1983 as the basis of component qualification for life extension. The staff noted that 10 CFR 50.49 and Regulatory Guide 1.89, Revision 1, discuss IEEE Standard 323-1974 which describes on-going qualification by testing but not life extension of component qualification by reanalysis. IEEE Standard 323-1983 introduces a new section on Extension of Qualified Life and the use of reanalysis and increasing qualified life by utilizing conservatism between the initial assumed environmental conditions and those observed. IEEE Standard 323-1983 has not been endorsed by the NRC staff. The staff stated that extending the qualified life of components based solely upon reanalysis may not be acceptable. The staff agreed to review the status of IEEE Standard 323-1983 and its potential use as an acceptable reference document for compliance with 10 CFR 50.49.

While the discussions focused on components currently included in an EQ Program required by 50.49, the staff also discussed the need to review the condition of equipment in the mild environment as part of the integrated plant assessment and aging management programs for license renewal.

Preaging - Components that were qualified to DOR guidelines and NUREG-0588 Category 2 were not required to be aged before type testing. Synergistic and dose rate effects are also not required to be addressed. NUMARC proposes to reanalyze these components based on an allowable extension in aging life under actual environmental conditions (normal service life). The staff noted that at this time there is insufficient data to conclusively predict the threshold of aging degradation that a component could sustain and still be expected to successfully pass a LOCA qualification test. Actual or accelerated aging plus LOCA test data may be needed for some component types. This is an area that will require further evaluation.

Extension of qualified life through reanalysis - The staff noted that it has generally not accepted analysis alone in lieu of testing. Experience has shown that qualification of equipment without test data may not be adequate to demonstrate functional operability during design basis event conditions. Reanalysis to justify a conclusion that service life is less severe and, therefore, the qualified life is extended may be acceptable. While the staff did not exclude this approach, the amount of plant specific data necessary to support such an approach is significant and is well beyond the amount of information typically recorded and retained by licensees. Such an approach

would have a significant impact on renewal application review schedules and would require extensive review on a component by component basis. This approach will affect the EQ files originally established.

Replacement components/Regulatory Guide 1.89 - The staff noted that replacement equipment must be qualified in accordance with the provisions of 10 CFR 50.49(1). The staff also noted that while Regulatory Guide 1.89 discusses exemptions to this requirement, such an approach may not be appropriate for license renewal. Replacement equipment that utilized one of the Regulatory Guide 1.89 "Sound Reasons to the Contrary" in lieu of qualification, may be subject to a one-time use only, if it is determined that the exemption is not applicable to the license renewal period.

Inspections and walkdowns - The staff discussed the need for licensees to conduct plant walkdowns/inspections in support of renewal application. Inspections which may include testing used to identify and define the status of components and any degradation. These components would then be subject to further evaluation to determine the cause and significance of the degradation and assess the need for corrective action. Inspection findings and follow-up evaluations would determine the need for and schedule additional inspections. Following receipt of the renewal application, the staff may conduct plant walkdowns to verify findings on selected components.

Generic Letter 88-07 - The staff discussed G.L. 88-07 in terms of continued reactor operation for inoperable equipment into the renewal period. For components within the scope of 10 CFR 50.49 in which a licensee does not have an adequate basis to establish qualification, the justification for continued operation (JCO) may not be allowed to be carried into the renewal period.

At the conclusion of the meeting, the following conclusions were noted:

- This first EQ meeting was useful in discussing issues related to license renewal.
- The issues of preparing for DOR and Category II plants, IEEE Standard 323-1983 methods of life extension, R.G. 1.89 one-time exclusion, and G.L. 88-07 JCO's will be dealt with in a technically sound manner in terms of plant safety. The staff will continue to work on these issues and be the subject of future discussions.
- The next meeting on equipment qualification will be held on April 16, 1991, to discuss staff comments to the Cable In-Containment IR.

NUMARC indicated that the meeting was beneficial and requested that the staff and NUMARC continue to work on the open issues on a timely basis in order to support the license renewal applications for the pilot plants.

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cc: E. Griffing, NUMARC
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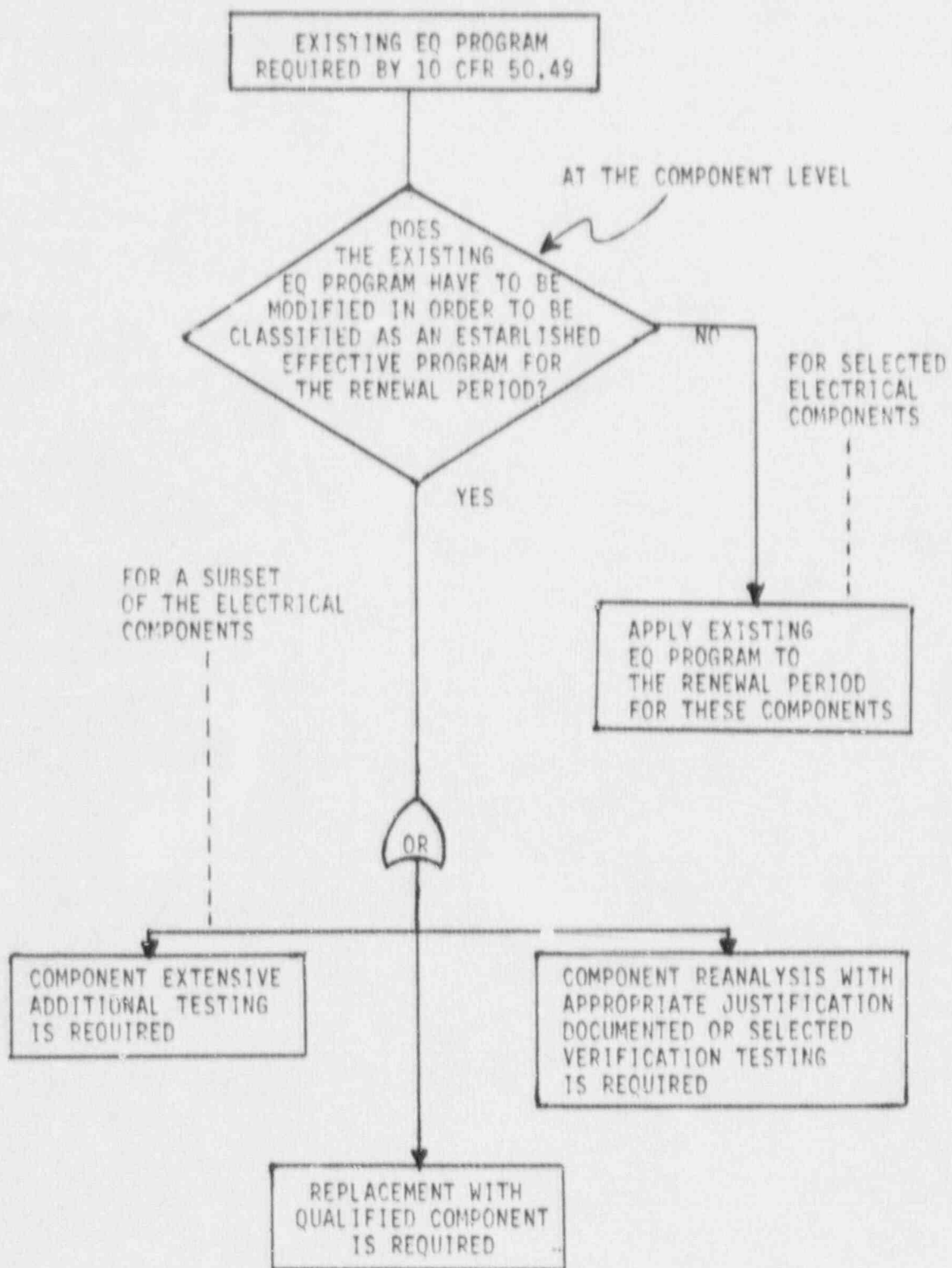
Enclosures:
As Stated

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LICENSE RENEWAL EQ FLOW DIAGRAM



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Enclosure 2

TOPICS FOR DISCUSSION

- o EXISTING 10 CFR 50.49 EQ PROGRAM AS AN ESTABLISHED EFFECTIVE PROGRAM
- o EXTENSION OF QUALIFIED LIFE FOR LICENSE RENEWAL PERIOD
 - 10 CFR 50.49 ACCEPTABLE METHODS
 - INDUSTRY REPORT REFERENCE TO IEEE STD 323-1984
- o PREAGING NUREG-0588 CATEGORY 2 AND DOR GUIDELINE COMPONENTS WHERE SIGNIFICANT AGING MECHANISMS HAVE BEEN IDENTIFIED
- o EXTENSION OF QUALIFIED LIFE THROUGH COMPONENT REANALYSIS (ARRHENIUS)
- o REPLACEMENT COMPONENT REQUIREMENTS
- o INSPECTIONS AND WALKDOWNS
- o GENERIC LETTER 88-07
- o REGULATORY GUIDE 1.89