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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 8, 1994

MEMORANDUM FOR: The Chairman
Commissioner Rogers
Commissioner Remick
Commissioner de Planque

FROM: James M. Taylor
Executive Director for Operations

SUBJECT: ENVIRONMENTAL QUALIFICATION OF ELECTRIC EQUIPMENT

In a staff requirements memorandum of June 28, 1993, the Commission directed the staff to treat environmental qualification (EQ) of electric equipment and fatigue as potential safety issues within the existing regulatory process for operating reactors and to periodically inform the Commission of the staff's efforts. This memorandum transmits to the Commission an updated report of the staff's progress with regard to EQ of electric equipment. Fatigue is being addressed in a separate memorandum.

To address EQ issues for operating reactors, the staff developed the EQ Task Action Plan (TAP). It was sent to the Commission as Enclosure 3 to the third quarterly report on fire protection issues dated July 1, 1993. The TAP describes present and future activities for both the Office of Nuclear Reactor Regulation (NRR) and the Office of Nuclear Regulatory Research (RES). It includes meetings with industry, a program review of EQ, data collection and analysis, a refined risk assessment, research on aging and condition monitoring, and development of options for resolving EQ concerns. An updated EQ TAP is enclosed.

The staff has met several times with the Nuclear Management and Resources Council, the Nuclear Utility Group on Equipment Qualification, and licensees to discuss activities under the TAP. As part of its activities to support the TAP, RES held a public workshop on November 15-16, 1993. It is using the information received at the workshop to develop the RES Program Plan.

The program review of EQ is continuing, and the staff has completed four site visits to gather information on licensee EQ activities. As documented in the TAP, the dates for some subelements of the program review have slipped up to 10 months. These delays can be attributed both to decisions to improve the overall efficiency of the program review by implementing some subelements in sequences that are different from those of the original schedule and to problems encountered in scheduling the site visits. However, these subelement delays have been minimized so that the completion date of the program review has slipped only 2 months to August 1994.

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Data collection and analysis activities are ongoing. RES has a contract with Brookhaven National Laboratory (BNL) to identify and evaluate existing EQ and aging data that are applicable to the activities of the TAP and to develop a database to assist in EQ activities. The staff has gathered information on experience with equipment replacement during the four site visits and will obtain additional information during the final site visit. The staff has prepared a draft report on the review of operating experience and will issue the final report in April 1994. While completion of the overall data collection and analysis activity has slipped 4 months to the end of 1994, the individual subelements of this activity will support the other TAP activities.

As documented in the original TAP, the staff issued a preliminary risk scoping analysis in April 1993. It has performed a more detailed risk assessment and prepared a draft report. However, issuance of the final report has been delayed pending completion of additional data collection and analysis activities. This additional information may provide further insight on which to base the final risk assessment.

As stated above, RES is developing a program plan that will include a cable test plan. The cable test plan will include testing of new, naturally aged, and artificially aged cables and evaluations of condition monitoring techniques that could give insights into methods for determining how equipment is actually aging and performing in plants. The plan will include testing of some cables under design-basis-event conditions. As stated above, RES is using information gathered at the workshop to develop its program plan. Under its contract, BNL is assisting RES in developing the cable test program. The staff will forward the RES Program Plan to the Commission as part of the next report on EQ.

As can be seen in the enclosed TAP, current estimates indicate that the predicted date of October 1994 for determining options for resolution of EQ issues will not be met. The options for resolution depend, in part, on the results of the RES test program. The RES test program will be a longer term project than initially estimated because there is considerable time involved in purchasing new cables, acquiring cables from plants, and conducting meaningful tests that include artificial aging.

Although current estimates indicate that research activities may take from 2 to 3 years, the delay in developing options for resolution does not have a safety impact. The staff has not identified EQ as an immediate safety issue, based on the 40-year qualified life of the components of concern and the degree of conservatism already included in the EQ test margins. To reduce the time to identify options for resolving EQ issues, a new Task 6 has been added to the TAP. Under this task, the staff will evaluate research results through December 1994 in combination with the results of other TAP tasks. The staff will use this evaluation to determine whether to make a safety decision based on available information and continue with confirmatory research, or whether there are any remaining items of concern that must be resolved with focused research before the staff can make a safety decision on EQ. However, to minimize any future delays, RES will proceed with the acquisition of equipment for testing and the development of test plans. The RES Program Plan will then

be adjusted to reflect the results of this task. The evaluation will start at the end of calendar year 1994 and is scheduled for completion at the end of February 1995.

Original signed by
James M. Taylor

James M. Taylor
Executive Director
for Operations

Enclosure:
EQ Task Action Plan

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