



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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Docket Nos.: 50-413, 50-414

MEMORANDUM FOR: David B. Matthews, Project Director
 Project Directorate II-3
 Division of Reactor Projects I/II
 Office of Nuclear Reactor Regulation

FROM: Carl H. Berlinger, Chief
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 Division of Engineering
 Office of Nuclear Reactor Regulation

SUBJECT: PROPOSED CHANGE TO CATAWBA NUCLEAR STATION FINAL SAFETY
 ANALYSIS REPORT (TAC NOS.: M-86367, M-86368)

In a May 12, 1993, memorandum, the NRC Region Ii office asked NRR to review the Duke Power Company (DPC) response to a finding on February 14, 1992, at the end of an electrical distribution system functional inspection (EDSFI) at Catawba Nuclear Station Units 1 and 2. The EDSFI finding and the DPC response to it were forwarded to EELB for staff review.

The EDSFI performed at Catawba Nuclear Station Units 1 and 2 from January 13 to February 14, 1992, identified in the Notice of Deviation (NOD) of March 18, 1992, a safety significant deviation from the following Final Safety Analysis Report (FSAR) commitment: "NUREG-0800, Standard Review Plan, states on page 8.3.2-5 that acceptance [of a design] is based on meeting the specific guidelines in Regulatory Guide 1.32, which endorses the Institute of Electrical and Electronics Engineers (IEEE) Standard 308."

IEEE Standard 308, in Section 5.3.1, states that protective devices should be provided to limit the degradation of Class 1E power systems. On page 8-75, of the FSAR, the licensee states that the system conforms to the requirements of this standard. In FSAR Section 8.3.1.1.2.2, the licensee states that protective devices on the 600-V ac essential auxiliary power system (EPE) are set to achieve a selective tripping scheme so that a minimal amount of equipment is isolated by an adverse condition such as a fault.

Contrary to these commitments, the incoming breakers to all the essential 600-V ac motor-control centers (MCCs) are not coordinated with the outgoing breakers from the MCCs. Further, 125-V dc vital instrumentation and control power molded-case breakers in the distribution centers are not coordinated for all faults.

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In an attempt to determine the impact on plant risk of those breakers that both the staff and the licensee agreed were uncoordinated, and to get further assurance that the consequences of the lack of coordination were insignificant, the staff, on December 6, 1993, sent a request for additional information (RAI) to DPC asking for (1) the locations of faults of any kind that could lead to uncoordinated breakers in the 125-V dc vital instrumentation and control power system and in the 600-V ac essential auxiliary power system, (2) the identity of the breakers, (3) the loads served, and (4) the consequences of losing the safety loads affected.

The licensee responded to the staff on February 7, 1994. Then on March 2, 1994, responding to the RAI, the licensee submitted copies of breaker coordination curves and system one-line drawings showing locations for the most probable worst-case faults, the associated fault currents, and the breakers that would not coordinate in case of dc double-line or three-phase faults. The licensee also submitted the calculations on which the fault currents were based and a list of loads that could not be powered if some breakers were not coordinated.

On the basis of the information submitted up to this time the staff cannot accept the licensee's proposal to change the FSAR commitments rather than the breakers themselves. The proposal is contrary to the staff's position, as stated in Generic Letter 88-15, "Electric Power Systems - Inadequate Control Over Design Processes":

"Lack of breaker coordination can create the potential for an unacceptable level of equipment loss during fault conditions. Thus, the designs of these electrical systems were not fully in conformance with GDC-17."

In Information Notice No. 88-45, "Problems in Protective Relay and Circuit Breaker Coordination," the staff's position is stated as:

"This information notice is being provided to alert addressees to a potentially significant problem concerning the possible lack of protective relay and circuit breaker coordination."

Consonant with NRR's position, expressed in T. Murley's September 17, 1993, memorandum to NRR Technical Staff, "Cost Beneficial Licensing Actions," wherein he stated, "Where licensees determine that significant resources may be saved by changing the manner in which their facilities are licensed to operate, the NRR staff should be receptive to reviewing the proposed changes.", the staff will review a licensee proposed FSAR change in lieu of the breaker and MCC change, if the licensee will submit to NRR, through PD II-3, a formal proposal to do so. The proposal should be sufficiently rigorous; for example, employing the Catawba probabilistic risk assessment and a defensible database so that the staff, after review of the proposal, could affirm, with reasonable confidence, that the failure to coordinate the subject breakers for all faults would not significantly increase the probability of a risk measure such as the core damage accident frequency.

To so affirm, the staff needs more information about the frequency of cable and MCC failures so as that the staff can determine the frequency of the initiating events and the resultant change to the core damage frequency.

The licensee should also show that order of magnitude changes in the assumed parameter values used in the PRA would not invalidate the conclusions of the PRA.

More than two years have already passed since this design deficiency was discovered by the EDSFI and still more time must pass before resolution of this issue. The uncoordinated breakers have existed for over 9 operating years at Catawba 1 and for over 8 operating years for Catawba 2. Assuming one more year to do the probabilistic analysis, and to get it reviewed by EELB, in all, 10 years will have elapsed with a potentially serious safety issue unresolved. This is too long.

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