

April 11, 2000

Template-NRR-106

Mr. W. R. McCollum, Jr.
Vice President, Oconee Site
Duke Energy Corporation
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2 AND 3 RE: FINAL ACCIDENT
SEQUENCE PRECURSOR ANALYSIS OF OPERATIONAL CONDITION

Dear Mr. McCollum:

By letter dated March 10, 2000, the NRC staff supplied you a copy of the final Accident Sequence Precursor analysis of the operational condition at the Oconee Nuclear Station, Units 1, 2, and 3, that was reported in Licensee Event Report No. 269/98-004. This was Enclosure 1 to the letter. Enclosure 2 contained our responses to your specific comments. It has recently been determined that page 26 of Enclosure 1 and page 3 of Enclosure 2 were inadvertently omitted from the letter. These pages are enclosed with this letter.

Sincerely,

/RA/

David E. LaBarge, Senior Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosure: As stated

cc w/encl: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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Oconee Nuclear Station

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Table 11. Sequence Logic for MLOCA Sequences for LER No. 361/98-003

| Event tree name | Sequence number | Logic |
|-----------------|-----------------|--|
| MLOCA + RECIRC | 2-4 | /RT, /HPI, /RBES-OK, CLBREAK, NO-DELAY, /DEPRESS, LPR-REC |
| MLOCA + RECIRC | 2-5 | /RT, /HPI, /RBES-OK, CLBREAK, NO-DELAY, DEPRESS |
| MLOCA + RECIRC | 2-9 | /RT, /HPI, RBES-OK, /CLBREAK, RBES-MIN, OPS-MIN, /DEPRESS, LPR-REC |
| MLOCA + RECIRC | 2-10 | /RT, /HPI, RBES-OK, /CLBREAK, RBES-MIN, OPS-MIN, DEPRESS |
| MLOCA + RECIRC | 2-14 | /RT, /HPI, RBES-OK, CLBREAK, RBES-MIN, OPS-MIN, /DEPRESS, LPR-REC |
| MLOCA + RECIRC | 2-15 | /RT, /HPI, RBES-OK, CLBREAK, RBES-MIN, OPS-MIN, DEPRESS |

1. For the medium-break LOCAs, ~90 min is required to deplete the BWST inventory. The time to significant core heatup following the loss of injection should be longer than for the large LOCA case discussed previously. The time available for evaluation is sufficient to establish a reasonable understanding of the nature of the events.
2. The TSC is expected to be available prior the loss of injection. Because the TSC will be in place during the important stages of the event, their evaluation is more likely to be rapid and correct. The availability of the TSC is expected to aid the control room in determining the appropriate action.
3. Considerations of break size and location that are not the most limiting would also contribute to a higher likelihood of success.

The availability of the TSC to monitor the accident and assist in the diagnosis and decision making is expected to provide reasonable reliability in arriving at an appropriate course of action. Success under these conditions is likely, and a nonrecovery probability of 0.1 is judged to be a more appropriate value. The medium-break LOCA situation is judged to be similar to the small-break LOCA situation because of the TSC availability.

Response 1b: The availability of the TSC by the time that sump switchover is required following a medium-break LOCA is acknowledged, at least for day-time working hours. This availability would impact branch OPS-MIN as well as LPR-REC. Since LPR-REC is only demanded if the operators fail to effect transfer to the sump before the ECCS pumps fail, the TSC, if available, will have also failed to understand the event before pump failure. Considering the limited time available to recover recirculation (15 min based on the Oconee PRA description of LLP0P3CREC), the burden imposed by the unusual nature of the failure, and the expected difficulty in analyzing the nature of the failure,^a a nonrecovery probability of 0.5 for LPR-REC (conditional on the failure of OPS-MIN) is considered appropriate and has been retained in the analysis. The intent was not to use 0.5 because there was complete uncertainty as to the recovery potential in a Bayesian sense, but to instead use the value because it was a reasonable estimate of the conditional probability that LPR would not be recovered, given that OPS-MIN had already failed.

The medium-break LOCA CCDPs, accounting for the unavailability of the TSC, are 9.8×10^{-7} for Units 1 and 2 and 8.5×10^{-7} for Unit 3; the overall CDDP for the event is 1.7×10^{-6} .

^aSee, for example, the analysis of LER No. 287/97-003 in the 1997 annual precursor report (*Precursors to Potential Severe Core Damage Accidents: 1997, A Status Report*, NUREG/CR-4674, Vol. 26, November 1998). In this event, two Oconee 3 HPI pumps were damaged during a reactor shutdown as a result of a low water level in the letdown storage tank. Over a 15-min time period following observation of low HPI pump discharge pressure, the operators started and stopped the two pumps and operated associated valves in an attempt to recover HPI pump discharge pressure before recognizing the potential cause of the problem and securing the pumps.