



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 53 TO FACILITY OPERATING LICENSE NPF-35  
AND AMENDMENT NO. 46 TO FACILITY OPERATING LICENSE NPF-52  
DUKE POWER COMPANY, ET AL.  
CATAWBA NUCLEAR STATION, UNITS 1 AND 2  
DOCKET NOS. 50-413 AND 50-414

1.0 INTRODUCTION

By letter dated October 16, 1987, Duke Power Company, et al., (the licensee) proposed changes to the Catawba Units 1 and 2 nuclear service water (RN) system Technical Specifications (TSs) and Section 9.2.1 of the Final Safety Analysis Report (FSAR). The proposed changes to the TSs are necessary to more specifically reflect the shared aspects of the RN system and identify in the TSs Bases Section that one RN pump can handle the heat loads from a LOCA in one unit and the shutdown heat loads from the other unit after it has been shut down for 36 hours.

The proposed TS changes are in response to the NRC staff's safety evaluation transmitted by letter dated September 30, 1987, related to a potential single failure in the RN system. In that evaluation, the staff concluded that the previous specifications for the RN system were inadequate with respect to action statements when a shared component was out of service during different modes of operation for each unit. The proposed changes to the FSAR also reflect, but are not limited to, design changes previously approved in the staff's September 30, 1987, safety evaluation. In addition to the previously approved design changes, the licensee also eliminated a simultaneous LOCA and seismic event which was identified as an original design basis. Although the basic design has not changed (i.e., all equipment necessary to be operable following a LOCA is designed to seismic Category I requirements), the reference to a simultaneous LOCA and seismic event has been deleted from the FSAR.

By letter dated January 22, 1988, the NRC staff requested additional information. The licensee's responses were provided by letter dated February 18, 1988. Further clarifications were also provided by letter dated May 12, and July 12, 1988. The substance of the changes noticed in the Federal Register was not affected by the July 12 letter.

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## 2.0 EVALUATION

The proposed RN system TS change (TS 3/4.7.4) requires that at least two independent RN loops be operable, with both units or only one unit in Mode 1, 2, 3 or 4. For two unit operation, each loop is required to contain two operable pumps and associated emergency diesel generators, two essential equipment supply and return headers, and a supply and discharge flow path capable of being aligned to the standby nuclear service water pond (SNSWP). With only one unit in Mode 1, 2, 3 or 4, each loop is required to contain at least one (in lieu of two) of the components/equipment identified for two unit operation.

For two unit operation, if the TS operability requirements cannot be met within 72 hours, at least one unit must be placed in at least hot shutdown within the next 6 hours and in cold shutdown within the following 30 hours. This action will restore two loops to operable status for any unit that remains in Modes 1, 2, 3 or 4. If the TS for single unit operation cannot be met within 72 hours, then the operating unit must take the same action identified for two units (i.e., hot standby in 6 hours, cold shutdown following 30 hours). The action statement must be taken after 72 hours for both units if only one RN loop is operable due to the inoperability of a shared valve, flow path or component (other than RN pump or its associated equipment). This action is necessary because the shared component flow path affects both units at the same time and is in accordance with the requirements of General Design Criterion 5 concerning sharing of systems. The revised specification also identifies that with RN unavailable to any essential equipment, the affected equipment will be declared inoperable and the applicable action statement for that equipment will be followed. This will prevent an incorrect interpretation of the RN specification by allowing the rest of the RN loop to remain operable.

The proposed TS change also revises the SNSWP specification (TS 3/4.7.5) to include a surveillance requirement to monitor the water temperature of Lake Wylie (the normal heat sink source for the RN system) during the months of July, August and September. This change is necessary because the automatic switchover to the SNSWP on a LOCA (high containment pressure) signal has been eliminated. During those periods of time when the Lake Wylie temperature is greater than 86.5 degrees Fahrenheit, the emergency procedure for transfer of ECCS flow paths to cold leg recirculation directs the operator to align at least one train of containment spray to be cooled by a loop of the RN system that is aligned to the SNSWP. This action will ensure adequate post-accident heat removal in accordance with the design basis accident analysis.

The Bases Section of the TSs has also been revised to reflect the above changes and to more clearly describe the shared aspects of the RN system. The Bases for TS 3/4.7.4 also identify that a single RN pump has sufficient capacity to maintain a unit indefinitely in cold shutdown, commencing 30 hours following a trip from full power while supplying the post-LOCA loads of the other unit.

The proposed changes to the RN system TSs specifically address the shared aspects of the system and the as-built conditions of the plant, i.e., some of the changes were necessary because of the recent design changes. The proposed changes are also responsive to the staff's concerns identified in the September 30, 1987 safety evaluation. Specifically, the existing RN TSs do not specify when an action statement applies to one or both units and do not clearly identify what is considered an independent loop or train. The action statements requiring hot standby in 6 hours and cold shutdown in the following 30 hours after a 72 hour time period are consistent with the existing TSs and with the Westinghouse Standard TSs.

The proposed changes to the SNSWP specifications were necessary to reflect a previously approved design change which eliminated the automatic switchover to the SNSWP on high containment pressure. The automatic switchover will continue to occur on low pump pit level indicative of a loss of Lake Wylie.

The proposed FSAR changes will revise Section 6.2 to reflect reduced RN flow rates to the containment spray heat exchanger and component cooling water (CCW) heat exchanger and Section 7.4 to reflect the fact that the automatic switchover to the SNSWP will not take place on high containment pressure. Section 9.2.1 will be revised to be consistent with the design changes regarding switchover, to indicate the capability of one pump to handle accident heat loads in one unit and the shutdown heat loads from another unit already in cold shutdown, and to decouple consideration of a simultaneous LOCA and seismic event.

The basis for the reduced flow rates to the containment spray and CCW heat exchanger is a reanalysis of post-LOCA containment performance utilizing reduced mass and energy release rates as stated in WCAP-10325 issued in 1979. The WCAP-10325 methodology was previously approved by the staff. The reanalysis showed that the present FSAR Section 6.2 analysis is bounding when the reduced RN flows are considered. This reanalysis was done under 10 CFR 50.59 and will be documented in a future FSAR revision. Because the reanalysis was performed using approved methodology, the staff finds the proposed revision to FSAR Section 6.2 to be acceptable. The same basis for acceptance is also applicable to a portion of the proposed revision to Section 9.2.1 of the FSAR, related to the reduced RN flowrates with one pump operation for a LOCA unit and a unit in cold shutdown. The staff also finds the proposed revision to FSAR Section 7.4 to be acceptable because it basically revises the FSAR to be consistent with the RN system supply automatic switchover design changes previously approved in the staff's September 30, 1987, safety evaluation.

As a result of its review of FSAR Section 9.2.1, the licensee also determined that the FSAR contained an unnecessarily conservative commitment for the RN system which required the postulation of a simultaneous LOCA and seismic event. Such an assumption is beyond the current licensing basis requirements. The licensee, therefore, deleted this commitment in the proposed FSAR revision for the RN system. The deletion of this commitment for the RN system is consistent with the deletion of the RN system supply automatic switchover from Lake Wylie

to the SNSWP on high containment pressure which is indicative of a LOCA. The staff agrees that a commitment to consider LOCA and seismic event consequences simultaneously is unnecessary. The design of the RN system continues to meet the design basis requirements (10 CFR Part 100 and General Design Criterion 2) for mitigation of a LOCA using seismically qualified equipment by retaining the automatic switchover to the seismically qualified SNSWP from the nonseismic Lake Wylie on low pump pit level. The SNSWP has been previously reviewed and approved by the staff as a suitable post-LOCA ultimate heat sink during initial plant licensing. Thus, the staff finds deletion of the commitment for consideration of simultaneous LOCA and seismic events to be acceptable for the RN system.

In addition to the above, it should be noted that the licensee proposed a revision to FSAR Section 9.2.1.3 for the RN system which deleted reference to the loss of Lake Wylie simultaneously with the design basis LOCA although no design changes were made to require this revision. As indicated above, while postulation of simultaneous LOCA and seismic events is beyond the current licensing design basis for the RN system, LOCA mitigating systems must be seismically qualified in accordance with the requirements of 10 CFR Part 100 and General Design Criterion 2. The staff and licensee recognize that adequate seismically qualified post-LOCA decay heat removal capability is available by use of the seismic SNSWP. Therefore, the staff requested that this reference not be deleted because seismic qualification for LOCA mitigating systems is a design basis applicable to the RN system which does not change because of the deletion of the commitment for consideration of a simultaneous LOCA and seismic event. By letter dated May 12, 1988, the licensee committed not to make the above proposed revision to FSAR Section 9.2.1.3 which would delete reference to the loss of Lake Wylie and thereby make it clear that appropriate seismically qualified post-LOCA decay heat removal capability is available.

Based on its review of the licensee's proposed TS changes related to the RN system, the staff concludes that they adequately address the sharing aspects of the RN system in accordance with the requirements of GDC 5, reflect the as-built system conditions, and address the staff's concerns identified in the September 30, 1987, safety evaluation. The staff also concludes that the proposed revisions to the FSAR are acceptable because they are consistent with or based on previously approved design changes and analysis methodology and are in accordance with the requirements of 10 CFR Part 100 and GDC 2 for ensuring a seismically qualified post-LOCA decay heat removal capability. The staff, therefore, finds the proposed RN system TS and FSAR changes to be acceptable.

### 3.0 EVALUATION

The Commission prepared an Environmental Assessment on the proposed Amendments and pursuant to 10 CFR 51.32 the Commission has determined that issuing these amendments will have no significant impact on the environment (53 FR 35394 )

#### 4.0 CONCLUSION

The Commission issued a Notice of Consideration of Issuance of Amendments to Facility Operating Licenses and Opportunity for Hearing which was published in the Federal Register (53 FR 22061) on June 13, 1988. The Commission consulted with the state of South Carolina. No public comments were received, and the state of South Carolina did not have any comments.

We have concluded, based on the consideration discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors:           K. Jabbour, PDII-3/DRP-1/II  
  W. LeFave, DEST/SPLB

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