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July 15, 1981

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: Catawba Nuclear Station
Docket Nos. 50-413, 50-414

Dear Mr. Denton:

The following comments are provided in response to Mr. Robert L. Tedesco's letter of May 26, 1981 concerning the conclusions of the Reactor Safety Study Methodology Applications Program evaluation of Sequoyah Unit 1.

Duke Power Company supports the use of probabilistic analysis as an aid in evaluating the level of safety associated with nuclear power plants, and particularly in the application of available resources for improving safety where they can be of the most benefit. However, reasonable application of these techniques requires a meaningful standard for comparison. Considering the level of details in the Sequoyah RSSMAP Study, we do not believe that studies such as the Sequoyah RSSMAP provide a good de facto standard. Therefore, we do not feel that the comparison of Catawba to the conclusions reached in RSSMAP is particularly appropriate in identifying necessary corrective actions. Nevertheless, we have reviewed each of the conclusions contained in pages 4-8 and 4-9 of the Sequoyah RSSMAP report with respect to the Catawba Nuclear Station, and our assessment is provided in the attachment to this letter.

Very truly yours,

William O. Parker, Jr.

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Attachment

cc: P. K. VanDoorn
Resident Inspector
Catawba Nuclear Station

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CATAWBA NUCLEAR STATION

ASSESSMENT OF SEQUOYAH RSSMAP
CONCLUSIONS WITH RESPECT TO CATAWBA
NUCLEAR STATION

RSSMAP CONCLUSION

An important accident sequence occurring for the Sequoyah plant results from the potential for blockage or closure of the drains between the upper and lower compartments. This causes a common-mode failure of the ECRS and CSRS when the sump runs dry (sequences S_1HF and S_2HF). The probability of these sequences could be reduced by improved checking procedures and improved fault detection capabilities.

COMMENTS

The Catawba containment contains six drain lines which are used to provide a flow path between the upper and lower compartments of containment. This compares with Sequoyah which has only two drain lines to perform this function. Since any two drain lines at Catawba are adequate to provide flow for the ECR and CSR, there is a significantly lower likelihood that failure to provide recirculation for Catawba would be due to blockage of drain lines. To prevent the accidental closure of the drain lines, each drain line valve (one per drain line) will be double verified after refueling operations. Confirmation of this requirement is required by the precritical valve alignment procedure. To help insure no blockage occurs, these lines are checked for blockage during periodic surveillance procedure.

RSSMAP CONCLUSION

Failure of the ECRS alone caused by component failures other than the drains also results in some important accident sequences.

COMMENTS

The ECRS is vital to the plant during a LOCA sequence; therefore, it would be expected that this would be the result. To quantify the failure probability of the ECRS failure and its importance to a dominant accident sequence, an analysis would be required. This analysis would identify major contributors to system failures and the systems importance to accident sequences.

RSSMAP CONCLUSION

Sequence V, in which check valve failures cause the high-pressure primary coolant to fail the low-pressure piping outside containment, remains an important sequence for Sequoyah. This sequence could be improved by a more strategic testing procedure ot the check valves over the limited testing capability which now exists.

COMMENTS

Provisions for the periodic leak testing to verify the operability of both inboard and outboard check valves will be included in the Technical Specifications for Catawba to minimize the possibility of an interfacing LOCA. These specifications are currently being reviewed and modified to include such a test procedure. The testing of both inboard and outboard check valves should decrease the probability of an interfacing LOCA to a significantly lower probability than Sequoyah, since it seems the Sequoyah procedure was to test the outboard check valve only.

RSSMAP CONCLUSION

Unlike larger containments, core melting caused by failure of ECIS or ECRS fails the lower pressure, smaller ice condenser containment by overpressure even though the containment cooling system continues to operate properly. The analysis of accident processes by Battelle Columbus Laboratories revealed that the smaller containment pressure and volume design would not withstand the pressure exerted by the noncondensible gases generated in the core meltdown accidents. (This result was similar to the RSS findings for the RSS BWR design.)

COMMENTS

Although a quantitative result for the functional capability of Catawba containment has not yet been defined, it is expected to fall within the range of the results for McGuire Nuclear Station (67.5 psig). This result is due to the near-duplicate relationship between McGuire and Catawba containments. We expect Catawba to withstand considerably higher pressures than Sequoyah (30 psig). Also, Duke Power Company has expended a significant effort to gain understanding into the causes and effects of the generation of noncondensible gases during a reactor accident. Duke Power has also taken actions to prevent and mitigate such events.

RSSMAP CONCLUSION

Sequence TMLB '-δ, which was important for the Surry plant as analyzed in the RSS, does not appear to be as significant to risk for Sequoyah due to the lower unavailability of on-site ac power.

COMMENTS

An indepth study would be required to conclude the same for Catawba, but since this is a positive feature, no study was deemed needed.

RSSMAP CONCLUSION

Failure of the containment cooling system causing core meltdown following a small LOCA (the S_2C sequence in the RSS) does not appear to lead to core meltdown at Sequoyah due to the difference in sump water temperature at the time of containment failure.

COMMENTS

The containment heat removal capability and the presence of the ice condenser should result in a similar result for Catawba.