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DENTON,H.R. Office of Nuclear Reactor Regulation, Director
STOLZ,J.F. Operating Reactors Branch 4

SUBJECT: Forwards proposed response dates to concerns in NRC 830608 ltr providing approval of proposed wide-range hot leg level/ reactor vessel head monitoring concept for coolant inventory tracking w/pumps off.

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July 18, 1983

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

Attention: Mr. John F. Stolz, Chief
Operating Reactors Branch No. 4

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Sir:

By letter dated June 8, 1983, the NRC provided approval of a proposed wide range hot leg level/reactor vessel head monitoring concept for coolant inventory tracking with pumps off as presented in Attachment III of my letter of March 10, 1983. The NRC letter requested that additional information be provided to address certain Staff concerns. The Staff initially wants a schedule for providing these responses. Accordingly, please find attached a total listing of Staff concerns identified by Duke and the proposed response dates.

Based on our review of the Staff concerns, Duke cannot agree with the Staff at this time that these concerns can be resolved with either attention during the detailed engineering design or with minor conceptual modifications as the Staff asserts, and still meet the Staff desired installation schedule of the latter half of 1985. The delay in resolution of these concerns and initiation of final design work will have an impact on the installation schedule due, in part, to the operating performance of Oconee Nuclear Station during the first six months of 1983 which results in refueling outages earlier in 1985 than Duke had previously provided. Specifically, Unit 1 was shut down June 1 for refueling and is expected to start up in early August. Its next refueling outage is anticipated for December 1984 or early 1985 rather than May 30, 1985 as indicated in my March 10, 1983 submittal. Unit 2 is scheduled to shut down in September 1983 for refueling with restart planned for December. Its next refueling outage is anticipated for June 1985 rather than July 1985 as indicated in my submittal. Unit 3, after refueling in the summer of 1984, will undergo its next refueling outage in September 1985 rather than November 1985 as indicated in my submittal. These dates are all subject to change and are for planning purposes only, but indicate that the most likely unit for initial installation would be Unit 3 rather than Unit 1 as estimated previously. Installation on the last Oconee unit would then be in 1987.

As stated in our March 10, 1983 submittal, implementation of the system can occur the first refueling outage commencing 24 months after NRC approval of the system based on approval of the Duke responses to Staff concerns to be provided on the schedule identified in the attached and the system concept

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approval which has been previously provided. Duke considers that Staff formal acceptance of our responses to the Staff concerns is necessary in order to assure that acceptance criteria for the final system are firmly established prior to initiation of detailed design, procurement and installation activities. Prompt Staff acceptance of the forthcoming Duke responses to Staff concerns will result in timely implementation of the final inadequate core cooling instrumentation system on the above schedule.

Very truly yours,

Hal B. Tucker

RLG/php

Attachment

cc: Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Mr. J. C. Bryant
NRC Resident Inspector
Oconee Nuclear Station

Mr. John F. Suermann
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attachment 1
Duke Power Company
Oconee Nuclear Station

Response to NRC Request for Information
Inadequate Core Cooling Instrumentation

Item		Response Date
A.(1)	From a measurement standpoint, the concept proposed in Attachment III of the licensee submittal appears to be a satisfactory approach to inventory tracking in the vessel head and one hot leg. However, if the other hot leg is unmonitored per our understanding, we have concerns about the capability to detect voiding and interruption of natural circulation in the unmonitored hot leg. This could be of particular importance for any accidents involving voiding or gas collection in one candy cane and not the other, or accidents requiring isolation of the steam generator associated with the monitored hot leg. Your evaluation addressing this concern should demonstrate that the monitors provided are sufficient to detect or infer void formation in either hot leg or the reactor vessel and to trend the coolant inventory in the total system.	August 26, 1983
(2)	From a safety standpoint, the staff has identified in Enclosure 1 some concerns which relate primarily to level measurement errors and to the vulnerability and potential consequences of a break in any of the instrument lines leading to the single tap in the decay heat line. During final design, Duke Power Company should be aware of these concerns and modify the design if necessary to assure that conditions which could mislead the operator will not exist. Before final approval of the design, Duke Power Company should provide an analysis of the level measurement errors for both the reactor head level and the hot leg level measurements and provide the additional information requested in Attachment 1. This information may be developed during final design engineering and submitted with the final design description. The staff should be notified of the schedule for this submittal.	August 26, 1983
B.	Reactor Coolant Pump Motor Current Monitor	
(1)	Duke Power plans to use existing pump current monitors which are non-safety grade but said to be highly reliable. Justification for deviation from NUREG-0737 seismic and environmental design requirements is not provided.	August 26, 1983

(2) The staff will require additional information concerning development of the pump current versus void correlations and justification for deviations from NUREG-0737 design requirements before we can complete our review. — August 26, 1983

C. Upgrading of Saturation Margin Monitor

(1) Duke Power Company states in their March 10, 1983 submittal that the subcooling margin monitors currently installed on the Oconee Units 1, 2, and 3 satisfy the requirements of NUREG-0578. Subsequent to installation of these systems, more detailed design requirements were provided in NUREG-0737 to define the long term upgrading requirements indicated by NUREG-0578. The licensee is requested to explain whether or not the presently installed subcooling margin monitor also conforms to the requirements of NUREG-0737 Section II.F.2 and Appendix B. — August 26, 1983

D. Upgrading of Core Exit Thermocouples — August 26, 1983

The licensee's submittal indicates that no exceptions are taken to the NUREG-0737 design requirements. However, the following additional information is needed so that we may complete our review.

(1) It is not clear from the design proposed that the primary and backup channels are separate and electrically independent, and that these channels are powered from Class 1E power sources. Clarification is requested. — August 26, 1983

(2) Specific data for surveillance, ease of repair and periodic testing should be provided when it becomes available. — August 26, 1983

E.(1) Provide an analysis of the expected errors in the hot leg and reactor vessel head level measurements. This analysis should include not only an overall estimate of the measurement uncertainty, but also a list including estimates of each contributing factor, i.e., temperature of the impulse lines, common mode pressure effects on the differential pressure transducer, and especially uncertainties associated with the transducers. Explain how the individual errors are combined to give an estimate of the overall error. — August 26, 1983

(2) With a single tap in the decay heat drop line implied by Figure 2, a failure in this line would affect all level measurements. Provide an assessment of the vulnerability of this common line to failure. What provisions will be made to protect it? August 26, 1983

(3) Suppose an impulse line on one hot leg was broken that would tend to drive the dp transducer full scale. How would this condition be detected? August 26, 1983

(4) Provide specifications for the proposed dp transducers.

(5) Provide an analysis to show the effects of flashing of dissolved gases in the impulse lines. August 26, 1983

(6) Discuss the ability of the transmitters to withstand a LOCA environment within the containment and be available for post-accident monitoring--consider the loss of the pressurizer transmitters in the TMI-II accident in this discussion. August 26, 1983

(7) Describe the proposed method for temperature compensation. Provide an analysis of the error that would be expected both with and without the temperature compensation. August 26, 1983

(8) Describe the location of indication of the state of the reactor pumps with respect to the level indicators in the control room. Describe the method proposed for indicating to the operator that the level measurement system should not be used when the pumps are on. August 26, 1983

(9) Describe the trending displays available for the operator for the ICC instrumentation. Are analog displays (recorders) provided for any of the ICC instrument outputs? August 26, 1983

(10) Describe the proposed tests to determine the reliability of CETs to 2300°F. August 26, 1983

(11) Describe in more detail how the SMM is used to monitor and control venting. August 26, 1983

(12) Estimate the errors in the HLLMS due to low local pressure at the reference tap during venting. August 26, 1983

(13) The description of the Attachment III proposed HLLMS is somewhat vague about the number of systems that would be installed on each plant.

(a) Explain the nomenclature used in Figure 2, i.e., OTSG, '1A' ('2B' '3B').

(b) Does a decay heat drop line exist on hot legs '1A' ('2B' '3B')? Is the pressurizer connected to the identified hot legs?

(c) The proposed design apparently does not include a HLLMS on both hot legs.

If it does not, then provide analyses showing:

(a) All transients or accident scenarios in which it would be possible to have voiding or gas collecting in one candy cane and not the other.

(b) What procedure would be used to vent noncondensable gases from the unsensed leg with no inventory monitor on that leg.

(c) The behavior of the water level in each hot leg during a loss of heat sink transient due to a break in a steam generator tube.

(d) A small break on one hot leg, but not the other.

(e) A loss of feedwater on one side but not the other.

(f) The behavior of the water level in each hot leg during a transient due to a stuck-open PORV.