Omaha Public Power District
1623 Harney Omaha, Nebraska 68102
402/536-4000

September 28, 1984
LIC-84-323

Mr. James R. Miller, Chief
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Licensing
Operating Reactors Branch No. 3
Washington, D.C. 20555

Reference: Docket No. 50-285

Dear Mr. Miller:

Evaluation of Inadequate Core Cooling Instrumentation System
for the Fort Calhoun Station Unit No. 1

The Omaha Public Power District received your letter dated July 11, 1984. By letter dated August 2, 1984 (LIC-84-250, R. L. Andrews to J. R. Miller) the District informed your office that the requested information concerning the subject would be provided by September 30, 1984. Accordingly, please find attached the District's response.

Sincerely,

R. L. Andrews
Division Manager
Nuclear Production

RLA/DJM/rh-C

Attachments

cc: LeBoeuf, Lamb, Leiby & MacRae
1333 New Hampshire Avenue, N.W.
Washington, D.C. 20036

Mr. E. G. Tourigny, NRC Project Manager

Mr. L. A. Yandell, Senior Resident Inspector

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Attachment 1

The July 11, 1984 letter (J. R. Miller to W. C. Jones) contained Enclosure 1, "Request for Additional Information - Omaha Public Power District's Proposed Inadequate Core Cooling Instrumentation System for Fort Calhoun Station Unit No. 1."

The District's responses are as follows:

1) Describe the status of the RVLMS installation including a schedule for completion of installation and calibration and provide a sketch to show the locations of those thermocouple sensors relative to the reactor size.

Response

The installation of the RVLMS is essentially complete. Reactor head modifications, heated junction thermocouple (HJTC) probes installation, in-containment mineral-insulated (MI) cable installation, and Qualified Safety Parameter Display System (QSPDS) installation have been accomplished. The RVLMS is currently undergoing an Operational Availability Demonstration Test and will be left running throughout the remainder of this operating cycle. This is to prove reliability and to allow personnel to gather experience with the system. Since plant startup from a refueling outage in July, 1984, the system has shown excellent reliability. Providing this performance continues, the system will officially be declared operable after the end of the next refueling outage, currently scheduled to begin in December, 1985 (reference Attachment 2 for detailed schedule). A core map showing relative Core Exit Thermocouples (CET's) and HJTC locations is attached, (see Figure 1).

2) Provide detailed plans for upgrading the core exit thermocouple system with respect to conformance with the design requirements of NUREG-0737, Item II.F.2. and identify deviations, if any. Also, provide the following information:

a. How many CET's will be upgraded? When will the upgraded system be completed?

b. What is the qualification status of CET cables, connectors, penetrations and compensation junction boxes?

Response

Twenty-eight (28) detectors were replaced in 1983 with ICI's which include a CET in each detector. A qualified thermocouple design is provided in this assembly. Thermocouple performance is guaranteed to 1650°F and calibration to this temperature features an accuracy of ±4°F to 530°F and ±3/4% to 1650°F. Thermocouple type testing has been conducted to 2300°F to verify integrity and function. These Class 1E qualified CET's are connected to the Class 1E QSPDS via LOCA-qualified MI cable in containment, and Class 1E qualified organic cable outside containment. Primary CET display in the control room is the Emergency Response Facility Computer System (ERFCS) and backup is the seismically qualified Class 1E QSPDS.

No known deviations from the requirements of NUREG-0737, Item II.F.2. exist. The CET system is qualified, including CET's, cables, connectors and penetrations. No compensation junction boxes are provided as this function is performed in the Class 1E QSPDS.

As stated in Item 1, above, installation of the system is complete; however, the system will not be declared fully operable until after the end of the next refueling outage (Also see Attachment 2).

c. How many CET's will be used for the backup display and how many CET's will be used for the primary display? If the same CET signal is used for both backup and primary display, will there be a qualified isolation device for signals to the primary display?

Response

Twenty-eight (28) CET's will be used for both the primary and the backup displays. Isolation between the two systems is accomplished by means of a fiber-optic data link between the QSPDS and the ERFCS.

3) Provide an evaluation of the final SMM with respect to NUREG-0737, Appendix B design requirements and identify deviations, if any.

Response

The existing Subcooled Margin Monitor (SMM) incorporates a Class 1E design and conforms with the design requirements of Appendix B to NUREG-0737 with the exception of the qualification status and range of the primary system RTDs. Additionally, recording capability for the existing SMM is not provided.

The District has investigated certain methods for upgrading the primary system RTDs including complete replacement, addition of new RTDs in the primary system piping, signal sharing, etc. This investigation is ongoing and the District believes that an SMM that conforms fully with the requirements of NUREG-0737 will be installed and operable following the 1985 refueling outage.

The final SMM will be the QSPDS with primary display and recording capabilities provided by the ERFCS and backup display by the QSPDS.

4) In addition to the primary display for ICCI (Critical Function Monitoring System), two backup displays will be installed. Identify the type and function of these two backup displays, and provide the completion schedule.

Response

The backup displays are Class 1E, seismically qualified plasma display units (PDUs) supplied as part of the Combustion Engineering QSPDS. The units are neon gas discharge type. They are currently located in the control room, mounted in the QSPDS cabinets. Determination of the final display location will consider results of the Detailed Control Room Design Review (DCRDR) currently in progress. These displays utilize human factors engineering principles to provide alphanumeric display of safety parameters including ICC parameters. These displays will serve as backup to the primary SPDS, each displaying one-half of the safety-related parameters. Completion date, as stated above, is the end of the 1985 refueling outage.

Attachment 2

Enclosure 2 to the July 11, 1984 letter (J. R. Miller to W. C. Jones), entitled "Milestones for Implementation of Inadequate Core Cooling Instrumentation," provided a list of items which must be completed in order to fully implement the ICCI system. The Safety Evaluation (SE) requests that these milestones be incorporated into the Fort Calhoun Unit No. 1 schedule and be provided for staff review.

Accordingly, the following represents the milestone dates for items found in Enclosure 2. It should be noted that these are only milestones and do not represent firm regulatory commitment dates.

1. Submit final design description (by licensee) (complete documentation requirements of NUREG-0737, Item II.F.2, including all plant-specific information items identified in applicable NRC evaluation reports for generic approved systems).

   Milestone Date: June 1985

2. Approval of emergency operating procedure (EOP) technical guidelines (by NRC).

   NOTE: This EOP technical guideline, which incorporates the selected system, must be based on the intended uses of that system as described in approved generic EOP technical guidelines relevant to the selected system.

   Milestone Date: January 1985

3. Inventory Tracking System (ITS) installation complete (by licensee).

   Milestone Date: 30 days after the end of the 1985 refueling outage.

4. ITS functional testing and calibration complete (by licensee).

   Milestone Date: 30 days after the end of the 1985 refueling outage.

5. Prepare revisions to plant operating procedures and emergency procedures based on approved EOP guidelines (by licensee).

   Milestone Date: 30 days after the end of the 1985 refueling outage.

6. Implementation letter report to NRC (by licensee).

   Milestone Date: 6 months after 1985 refueling outage

7. Perform procedure walk-through to complete task analysis portion of ICC system design (by licensee).

   Milestone Date: Prior to 1985 refueling outage

8. Turn on system for operator training and familiarization.

   Milestone Date: Currently the system is turned on for testing and familiarization and will be used for some training purposes beginning the summer of 1985. Official training will not begin until completion of #5 and #7.

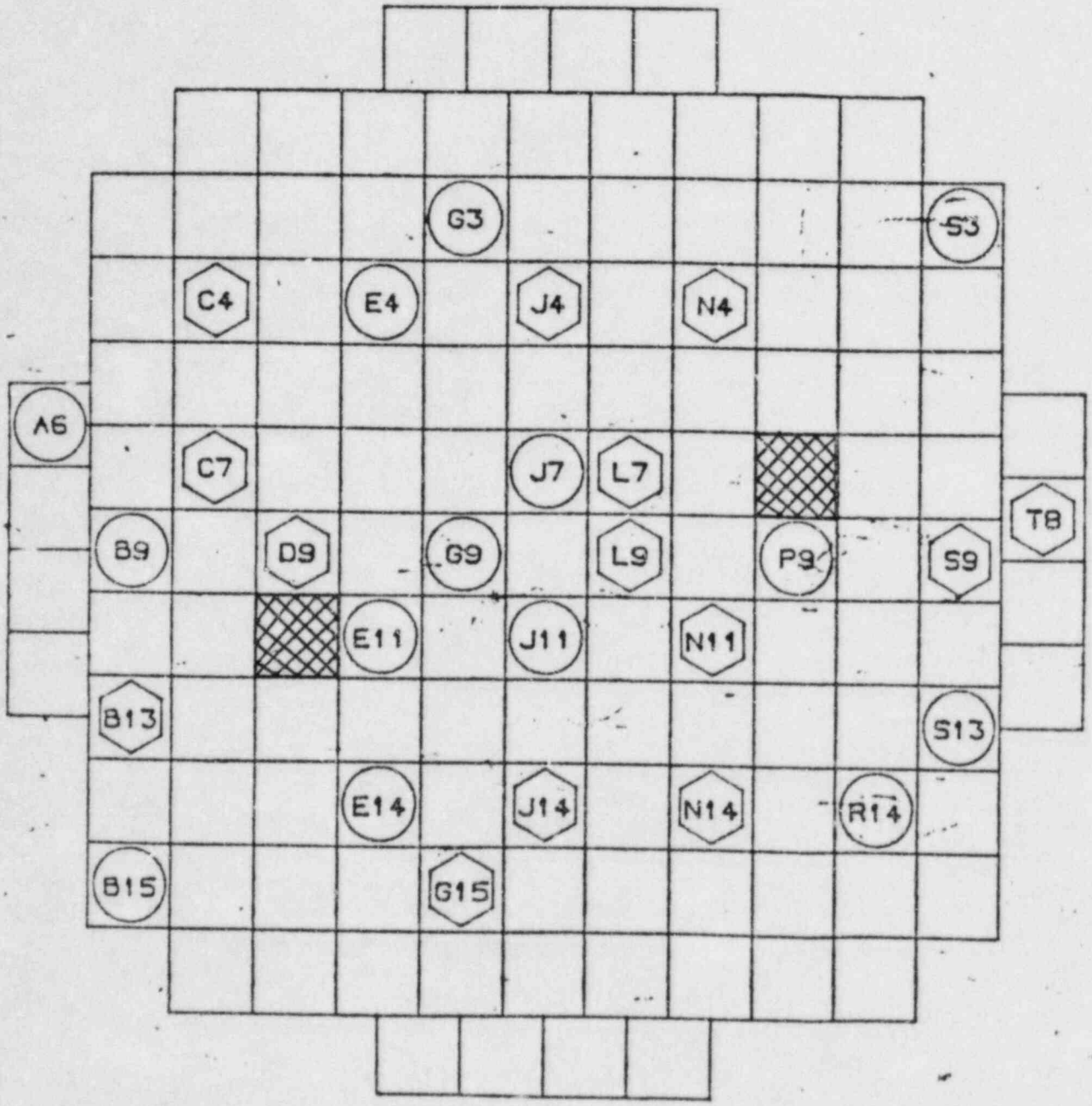
9. Approval of plant-specific installation (by NRC).

   Milestone Date: 90 Days After #6

10. Implement modified operating procedures and emergency procedures (by licensee).

    Milestone Date: 60 Days After #9

FIGURE 1



T/C CORE LOCATIONS-CHANNELS A&B

(XXX) = CHANNEL B ⬡XXX⬡ = CHANNEL A

▨ = APPROXIMATE HJTC PROBE LOCATIONS