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

July 19, 1985
LIC-85-319

Mr. Edward J. Butcher, Acting Chief
Operating Reactors Branch #3
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, DC 20555

References: (1) Docket No. 50-285
(2) Letter OPPD (R. L. Andrews) to NRC (J. R. Miller) dated September 28, 1984 (LIC-84-323)
(3) Letter OPPD (R. L. Andrews) to NRC (E. J. Butcher) dated June 27, 1985 (LIC-85-211)

Dear Mr. Butcher:

NUREG-0737, Item II.F.2
Inadequate Core Cooling Instrumentation (ICCI)

Reference (2) provided the Omaha Public Power District's milestone schedule for submittal of the final design description for the ICCI, including the documentation requirements of NUREG-0737, Item II.F.2. Reference (3) supplied the final design description and noted that this package was currently undergoing independent review. This letter provides clarifying information as a result of this review. The attachment to this letter contains the changed pages to the Reference (3) submittal. The changes are denoted by vertical lines in the right hand margin.

Sincerely,

R. L. Andrews
Division Manager
Nuclear Production

RLA/DJM/dao

Attachment

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

Mr. E. G. Touringy, NRC Project Manager
Mr. L. A. Yandell, NRC Senior Resident Inspector

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The following information is displayed on the QSPDS displays:

A. Liquid inventory level above the fuel core.

B. Unheated junction temperature at the eight positions.

C. Heated junction temperature at the eight positions.

D. Temperature differential at the eight positions.

The following plant-specific information is hereby provided:

i) Paragraph 3.1.1 of Reference 3.2 listed C-E's recommended instrument ranges for certain SMM inputs:

INPUT	RECOMMENDED RANGE	FC1 RANGE
Pressurizer Pressure	0-3000 psia	0-2500 psia
Cold Leg Temperature	60-710°F	465-615°F
Hot Leg Temperature	60-710°F	515-665°F
UHJTC Temperature	100-1800°F	32-2300°F

Pressurizer pressure indication provided is adequate to monitor all anticipated pressure events analyzed in the USAR. For those analyses the pressure will not exceed the 2500 psia end point.

A commitment has been made (Ref. 2.6) to upgrade the qualification and range of the hot and cold leg RTD's.

ii) Paragraph 3.2 of Ref. 3.2 stated that alarms for the following ICC variables will be provided with setpoints to be predetermined on plant-specific bases. For Fort Calhoun, these setpoints are as follows:

VARIABLE	SETPOINT
Temperature Subcooled Margin	$\leq$ 10°F subcooled
Core Exit Temperature	$\geq$ 670°F
Reactor Vessel Level	$\leq$ 100%

iii) The primary displays for the ICCI information are the Emergency Response Facilities Computer System (ERFCS) CRT's located in the control room. The ERFCS is a Modcomp based digital computer system. Some details of the system are shown in Figure 1 and additional information is provided in the response to Item 4.2.

1.b. detailed description of existing instrumentation systems.

OPPD currently utilizes a Combustion Engineering Subcooled Margin Monitor. This device receives inputs of pressurizer pressure and RCS hot and cold leg temperatures and displays margin (both temperature and presssure) to subcooling. Two independent channels are provided. Additionally, RCS temperature and pressure indications are displayed on the main control board. Range upgrade and LOCA qualification of the primary system hot and cold leg RTD's are addressed in reference 2.6.

1.c. description of completed or planned modifications.

A description of, and schedule for changes to the SMM RTD's was provided in reference 2.6, Attachment 1, Response 3. Additionally, as described in the District's Reg. Guide 1.97 submittal, (Reference 2.9), the range of the pressurizer pressure transmitters will be modified if the resolution of the ATWS issue indicates the need for such an upgrade.

2. A design analysis and evaluation of inventory trend instrumentation, and test data to support design in item 1.

The design analysis and evaluation of the ICC detection instrumentation is addressed in reference 3.2. Additional information on the design analysis and evaluation is provided in reference 3.8. Reference 3.1 provides answers to previous NRC questions regarding the HJTCS.

Test data to support the design of the HJTCS is provided in references 3.3, 3.4, and 3.6.

NRC analysis of these evaluations is provided in reference 1.2.

3. Description of tests planned and results of tests completed for evaluation, qualification, and calibration of additional instrumentation.

System qualification and system verification testing is discussed in sections 5.0 and 6.0 of reference 3.2. Additional details and test documentation is provided in references 3.3, 3.4, and 3.6.

A functional test procedure, designed to verify performance of the QSPDS, including software routines and proper display functioning, has been prepared and performed. Additionally, a hardware test procedure, designed to ensure proper function and calibration of the QSPDS microprocessors, has been performed. Results of these tests indicate correct and satisfactory performance of the hardware, software, and display equipment. Portions of these tests will be incorporated into a routine system test procedure to demonstrate and assure continued system performance and calibration of the ICCI associated instrumentation.

4.4. Describe the use of the primary and backup displays. What training will the operators have in using the core exit thermocouple instrumentation? How will the operator know when to use the core exit thermocouples and when not to use them? Reference appropriate emergency operating quideline where applicable.

The primary ICCI displays are the plant SPDS CRT's located in the control room. The backup displays are the QSPDS Plasma Display Units (PDU's) mounted in the QSPDS panels in the control room. The backup displays are required for operator use only in the event the primary SPDS displays are not operable.

Emergency Operating Procedures (EOP's) consistent with the standard C-E EPG's are currently being developed. Training in the use of the CET's will be covered when these plant-specific EOP's are finalized.

The District's submittal of April 15, 1983 (Reference 2.3, Attachment 4) provides a general description and schedule for the upgraded EOP's.

(E4)

4.7. Confirm the environmental qualification of the core exit thermocouple instrumentation up to the isolation device.

The core exit thermocouples their associated cabling, the QSPDS microprocessors and displays and the isolation device in the QSPDS (i.e., the fiber optic modem) are qualified for use in their respective environments. See response to item 1 of Appendix B to NUREG-0737, contained in this submittal on Page 40.

2. Single failure analysis

Two physically separate, electrically isolated trains of ICC instrumentation are provided. No single failure within either the instrumentation, its auxiliary supporting features, or their power sources concurrent with the failures that are a condition or result of a specific accident will prevent the operators from being presented the ICC information.

In the remote possibility that one complete channel of instrumentation is lost, there is sufficient diversity of information (e.g., hot and cold leg temperatures, pressurizer pressure, subcooled margin, reactor vessel level, etc.) presented by the surviving channel to prevent information ambiguity.

3. Class 1E power source

Each channel of the QSPDS, including HJTC heater control and HJTC, SMM and CET signal processing, the backup displays, and the class 1E to non-1E isolation devices are powered from the station's vital instrumentation buses. These buses are energized from the station standby power sources and are backed up by batteries.