

DUKE POWER COMPANY

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VICE PRESIDENT
NUCLEAR PRODUCTION

May 14, 1984

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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 and 50-414

Dear Mr. Denton:

Ms. Elinor G. Adensam's letter of April 10, 1984 requested confirmation of implementation of TMI Item II.F.2, Instrumentation for Inadequate Core Cooling. The following summarizes the status of each system.

The Incore Thermocouple System has been installed. Thermocouple connectors will be modified during early May 1984. Functional testing and calibration will be completed after the reactor vessel head is installed subsequent to fuel loading and prior to entering Mode 3.

The Reactor Vessel Level Indication System (RVLIS) was scheduled to be installed in early May 1984. Westinghouse Electric Corporation has been contracted to functionally test and calibrate the system in two phases: vacuum filling of the instrumentation and hydraulic lines, and calibration/start-up tasks. The second phase of work will be performed with actual reactor coolant flow data taken with pumps running and the core in place. This will be completed prior to entry into Mode 2.

The subcooling margin monitor function has been programmed for the Operator Aid Computer. Checkout of this function was performed during Hot Functional Testing.

Each of the above systems is described in Table 1.9-1 of the Catawba FSAR. Attached are revisions to this table which will be included in Revision 10. A summary of licensee conclusions will be included in the Startup Summary Report which is required by Technical Specifications 6.9.1.1, 6.9.1.2, and 6.9.1.3. Each of the above systems are addressed in the Technical Specifications which are currently under review by the NRC Staff. Emergency operating procedures (EOPs) to be used at Catawba were discussed in my letter dated February 24, 1984.

Very truly yours,

H.B. Tucker / HBT
Hal B. Tucker

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Mr. Harold R. Denton, Director
May 14, 1984
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cc: Mr. James P. O'Reilly, Regional Administrator
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Response to TMI Concerns

Incore Thermocouple System

I. Present Design

The present incore thermocouple system has 65 T/C's (thermocouples) positioned to sense exit flow temperature of selected fuel assemblies. The T/C's penetrate the reactor vessel head in 5 locations known as instrument ports. Each instrument port has 13 T/C's. Electrical connection to the T/C's is made at the instrument ports by qualified connectors. The class 1E thermocouples are cabled to qualified thermocouple penetrations. Forty of the thermocouple channels have been upgraded as described to insure a minimum of four per core quadrant are always available. The system design accounts for attrition. The remaining junction boxes inside containment to allow transition to copper for the remainder of the cabling including the run to an instrument penetration. Outside containment, the class 1E T/C's are cabled to reference junction boxes to allow the transition to copper wire. These cables are cabled to the backup display along with the non-safety T/C's. The backup display will display T/C readings in the control room by use of push-to-read switches. All T/C's are cabled from the backup display to the primary display, the plant computer. The Incore Thermocouple System is shown on Figure 1.9-7.

A. Present System Capabilities (NUREG 0737 II.F.2 Attachment 1 format)

1. Core inlet temperature data is used with core exit temperature to give radial distribution of coolant enthalpy rise across the core. This is available to the operator via CRT or hard copy in the control room.
2. The plant computer via CRT is the operator's primary display having the following capabilities:
 - a. A spatially oriented core map is available on demand indicating temperature and enthalpy rise at each core exit thermocouple location.
 - b. The incore thermocouples are an input into the saturation monitor program to assist operator actions for inadequate core cooling procedures.
 - c. Direct readout via CRT and hard copy print out capability is provided for all thermocouple temperatures. This readout range extends from 200 degrees F. to 2300 degrees F.
 - d. Trending of selected thermocouples to show temperature - time history is available on demand.

Response to TMI Concerns

9. The provisions of Duke Power Company's Quality Assurance Program as described in FSAR Chapter 17 and Topical Report Duke 1 were applied to the Class 1E incontainment portion of the system. The remainder of the existing system is non-safety.

II. Incore Thermocouple System Upgrade

The present incore T/C system will be upgraded in the following manner. From outside of containment the non-safety thermocouple cabling will not be altered. However, the class 1E T/C cables will be cabled to a class 1E backup display directly from the T/C penetrations. These T/C's will be cabled to the primary display using qualified isolation devices. The backup display will be selected as part of the ongoing control board review. A description of the upgraded display will be provided by December 31, 1984.

The upgrade of the incore T/C system will be completed on Unit 1 by or during the first refueling and on Unit 2 prior to fuel load.

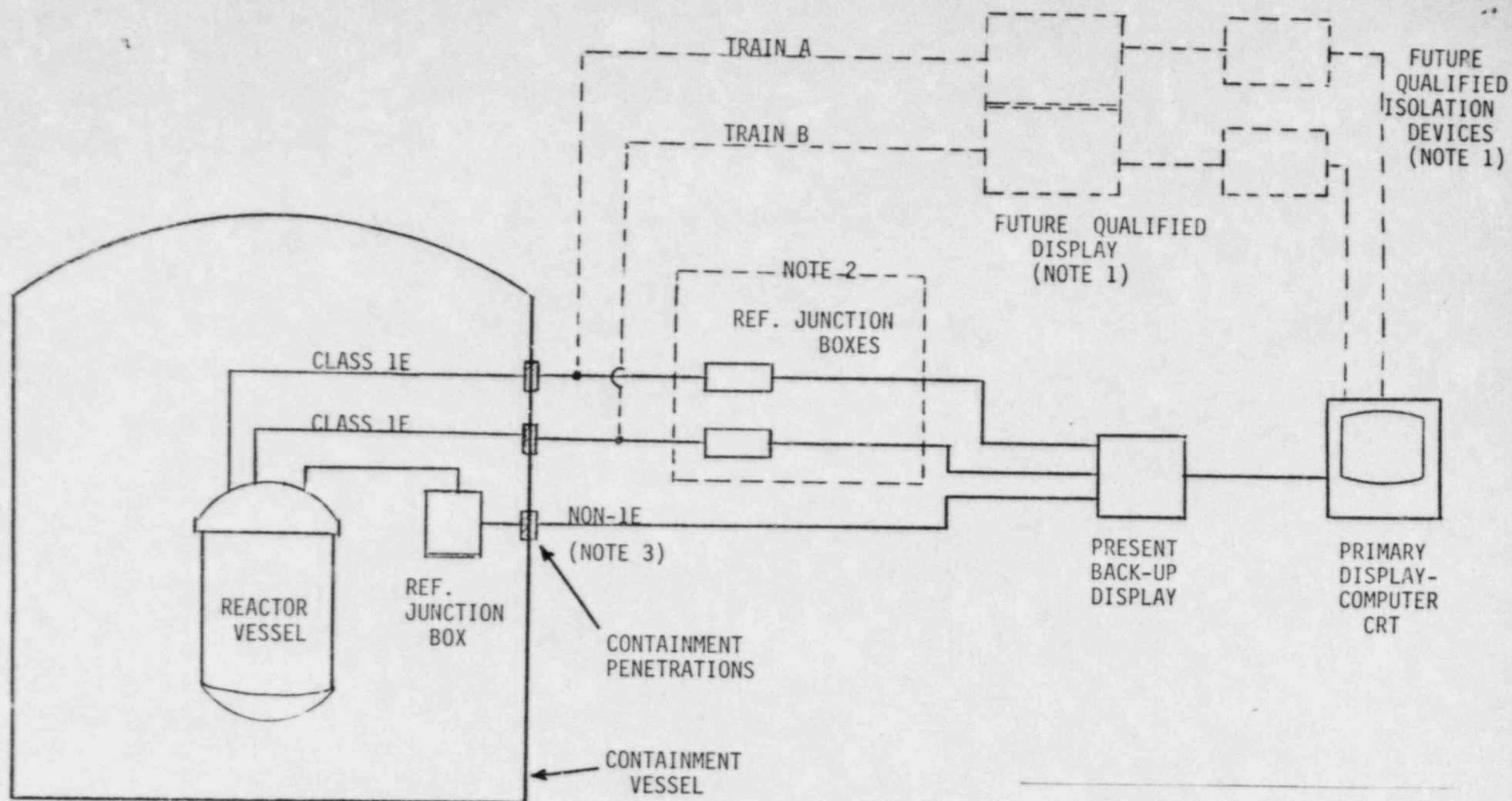
A. Upgraded System Capabilities (NUREG 0737 II.F.2 Attachment 1 format)

Display capabilities will be the same as the present design description with exceptions listed below. Exception numbers correspond to original design numbers.

2(f) & 4 The control room review will be completed and all operator display devices will be human factor designed.

5. The following consists of an evaluation of the Catawba Nuclear Station Incore Thermocouple System upgrade compliance with Appendix B to Item II.F.2. The paragraph numbers relate directly to Appendix B paragraph numbering.

- (1) The Class 1E instrumentation will be environmentally qualified in accordance with Catawba FSAR Section 3.11 and the Duke Power Company NUREG-0588 submittal. The qualification will apply from the sensor (qualification assumed per II.F.2 guidance) to the final display device. For the primary display via the plant computer, qualification applies from the sensor to the isolation device. The isolation device will be accessible for maintenance during accident conditions.



NOTES

NOTE 1: The dotted system components and cables will be added during the upgrade of the incore thermocouple system.

NOTE 2: These components will be removed during the upgrade of the system.

NOTE 3: These portions of the system will retain their present configuration after the upgrade.



INCORE THERMOCOUPLE
SYSTEM CONFIGURATION
CATAWBA NUCLEAR STATION

Figure 1.9-7
Rev. 10
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