



CHARLES CENTER • P. O. BOX 1475 • BALTIMORE, MARYLAND 21203

ARTHUR E. LUNDVALL, JR.
VICE PRESIDENT
SUPPLY

October 14, 1983

Director of Nuclear Reactor Regulation
Attention: Mr. J. R. Miller, Chief
Operating Reactors Branch #3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Calvert Cliffs Nuclear Power Plant
Units Nos. 1 & 2; Dockets Nos. 50-317 and 50-318
Inadequate Core Cooling Instrumentation (ICCI)

Reference: NRC Generic Letter 82-28 from D. G. Eisenhower to All Licensees
of Operating Westinghouse and C-E PWR's, same subject, dated
December 10, 1982.

Gentlemen:

The purpose of this letter is to report to you our progress in implementing the requirements of the referenced generic letter with regard to the subcooled margin monitor and the core exit thermocouple monitoring system. Issues which remain outstanding include environmental qualification of each of these two ICCI subsystems and installation of a new core exit thermocouple monitoring system that satisfies the intent of NUREG-0737, Item II.F.2. The current status of each of these issues is discussed below.

Subcooled Margin Monitor

The subcooled margin monitor consists of temperature and pressure sensors, associated cabling and connectors located inside containment, and redundant digital subcooled margin calculators and displays located outside containment. As described in previous correspondence, the subcooled margin monitors were installed utilizing existing reactor coolant system instrumentation channels (reactor protection system inputs). Since these channels were originally classified as safety related and remain classified as such for use in inadequate core cooling instrumentation channels, formal qualification of components located inside containment is being accomplished under our ongoing environmental qualification review program required by 10 CFR Part 50, Paragraph 50.49.

To ensure completeness in our review of components located outside containment, we are awaiting environmental qualification data from the vendor of the subcooled margin calculator and display.

All required information concerning subcooled margin monitor design criteria and performance was provided in earlier correspondence. The subcooled margin monitor

8310240134 831014
PDR ADDCK 05000317
P PDR

App 2
1/10

has been incorporated into the emergency operating procedures at Calvert Cliffs and operator training has been completed under the revised procedures.

Core Exit Thermocouple Monitoring System

The Calvert Cliffs core exit thermocouple monitoring system will utilize existing thermocouples associated with the incore instrumentation system. A preliminary review of the incore instrumentation system and associated cabling, connectors and control room display instrumentation indicate that conformance to the design criteria contained in NUREG-0737 may require significant plant modifications. Therefore, additional engineering reviews are being conducted to evaluate potential modifications as described below for the principal components of the core exit thermocouple monitoring system.

1. Ex-vessel Connectors

The Calvert Cliffs incore instruments currently utilize Gulton connectors at the cable-to-incore instrument guide tube flange termination points. These connectors were originally supplied under the NSSS scope of supply as safety-related components; however, qualification for post-accident service would be required for use in the core exit thermocouple monitoring system. An alternative would be to replace the Gulton connectors with a type that is already qualified. Since either option would involve considerable additional expense, we are in the process of evaluating both options to determine which one will accomplish our qualification objectives most efficiently given the scheduler constraints of 10 CFR Part 50, Paragraph 50.49.

2. Instrument Cabling

We have determined that the incore instrument cables and containment electrical penetrations are qualifiable for post-accident, in-containment applications. Formal qualification of these components will be accomplished under our ongoing environmental qualification program.

3. Signal Processors and Control Room Displays

Core-exit thermocouple signals are currently processed by the plant computer and displayed in tabular form on the control room printers. NUREG-0737 recommends, in part, that the primary display of core exit temperatures consist of a human factored, spatially oriented core map with the capability for rapid access to trending data and hard copy read-outs. In addition, a backup display is discussed which would consist of an electrically independent display in the control room capable of providing readout for a minimum of 16 operable thermocouples.

NUREG-0737 also describes the specific design criteria and quality standards that shall be applied to core exit thermocouple display instrumentation.

To satisfy the system performance and quality criteria contained in NUREG-0737, the existing Calvert Cliffs core exit thermocouple signal processing and

display system must be completely re-designed. The signal isolation and physical separation requirements associated with providing both a Class IE and a Non-Class IE display will require tapping directly into existing instrument loops to provide signal inputs (through isolation devices) to the Non-Class IE display. The requirement for a Class IE backup display limits the use of the plant computer to signal processing for the primary display. Consequently, a separate signal processing capability must be provided. To meet the requirement for a spatially oriented, human factored display either a hardwired core mimic display on the control board, or a computerized display on a CRT would be needed.

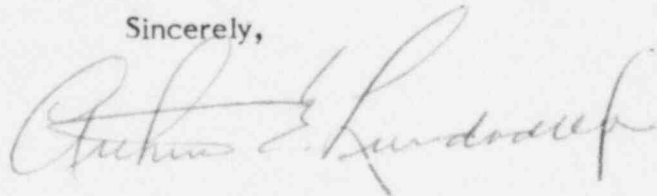
Various options exist for implementing these requirements, however, all of them are dependent upon two major projects that are currently underway at Calvert Cliffs. As you know, a Data Acquisition System (DAS) is being installed at Calvert Cliffs that will serve to receive and condition instrument signals for use as input to the plant computers and other non-Class IE control room equipment. The DAS will ameliorate the need for tapping into existing Class IE instrument loops to provide additional non-Class IE control room displays such as the primary display now required for the core exit thermocouples.

You are also aware that we are procuring a new main-frame computer system for installation at Calvert Cliffs which will replace the existing plant computers. Associated with the plant computer replacement project is the installation of a Safety Parameter Display System (SPDS) utilizing a human factored CRT display.

Given the extensive upgrades that are currently underway in the area of data collection, processing, and display at Calvert Cliffs, we feel that implementation of a new core exit thermocouple monitoring system would best be performed on a schedule that is consistent with that for the above projects. Our preliminary schedule for completing these upgrades was provided in our response to NRC Generic Letter 82-33. As we indicated in previous correspondence, the core-exit thermocouple monitoring system will be engineered to meet the intent of the criteria contained in NUREG-0737 in that any deviations will be justified.

If you should have any questions concerning our approach for implementing improved inadequate core cooling instrumentation at Calvert Cliffs, please do not hesitate to contact us.

Sincerely,



cc: J. A. Biddison, Jr., Esq.
G. F. Trowbridge, Esq.
Mr. D. H. Jaffe, NRC
Mr. R. E. Architzel, NRC