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Director of Nuclear Reactor Regulation
Attention: Dr. W. R. Butler, Project Director
Project Directorate I-2
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUSQUEHANNA STEAM ELECTRIC STATION
PROPOSED AMENDMENTS 138 TO LICENSE NO. NPF-14
AND 92 TO LICENSE NO. NPF-22:
REVISIONS TO TEMPERATURE LEAK DETECTION
RWCU/HPCI/RCIC SETPOINTS
PLA-3487 FILE A17-2, R41-2

Docket Nos. 50-387
50-388

Dear Dr. Butler:

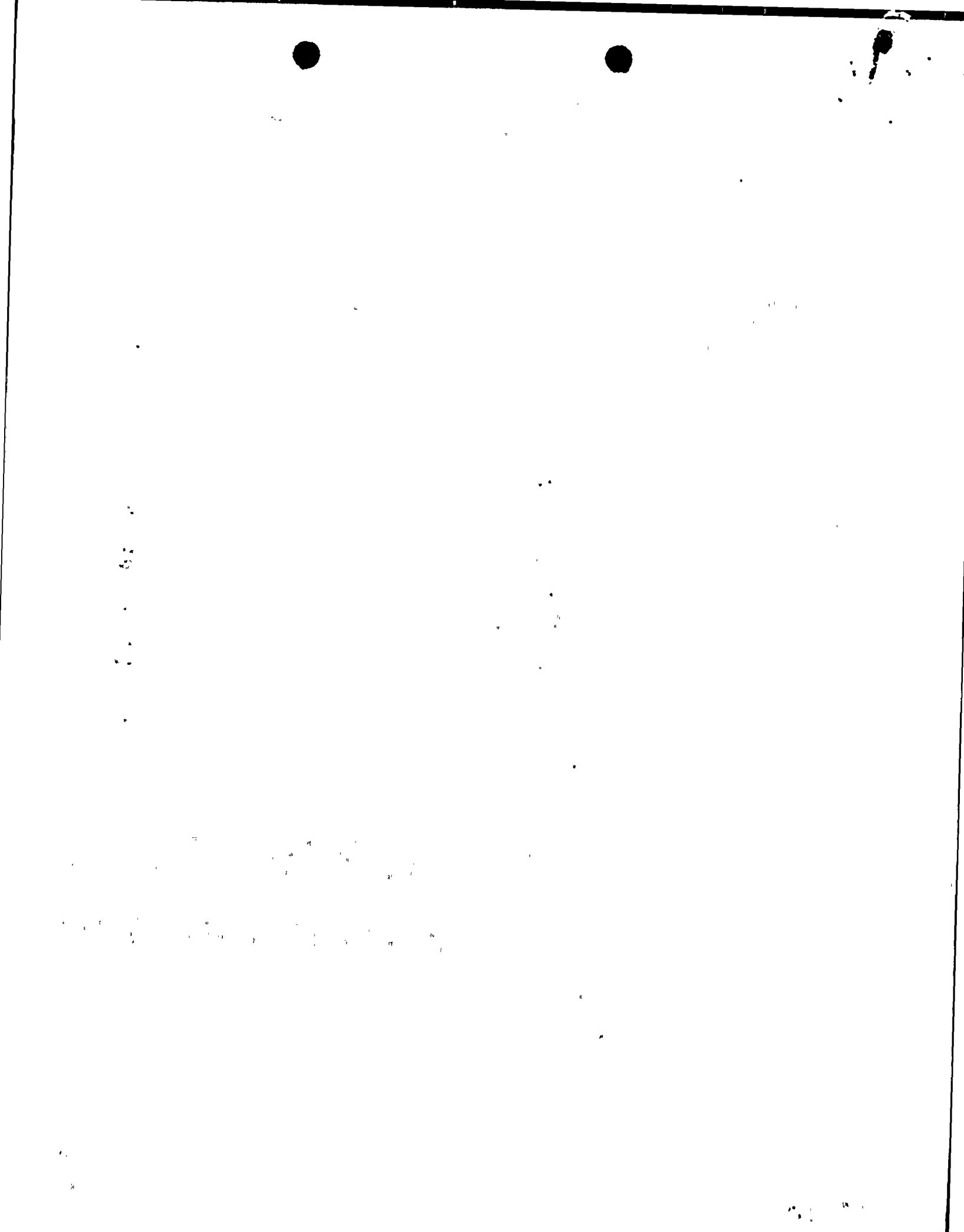
The purpose of this letter is to propose changes to the Susquehanna SES Unit 1 and Unit 2 Technical Specifications to revise the isolation setpoints for the ambient and differential temperature leak detection function in the RWCU penetration room and HPCI and RCIC room coolers. This technical specification change does not impact our proposed amendment 127 to NPF-14 and amendment 79 to NPF-22 to delete the isolation function of the differential temperature sensing system associated with leak detection (PLA-3330 dated January 26, 1990).

DESCRIPTION OF CHANGE

This proposal results in the revision to the isolation setpoints that are presently associated with ambient and differential temperature leak detection for the RWCU penetration room and HPCI and RCIC room coolers. These systems interface with the reactor coolant pressure boundary (RCPB) but are outside the primary containment boundary. The Technical Specifications involved are portions of Table 3.3.2-2, which specify ambient and differential temperature circuit requirements. The changes are illustrated on the attached marked-up pages.

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SAFETY ANALYSIS

The SSES FSAR Section 5.2.5.1.3(1) defines the basis for HPCI, RCIC and RHR ambient and differential temperature as follows: "the setpoint includes sufficient margin above the post-LOCA maximum temperature to preclude inadvertent isolation signals" and that "consideration has been given to keeping this setpoint low enough to allow timely detection of a 5 gpm leak." SSES FSAR Section 7.3.1.1a.2.4.1 describes the "Primary Containment and Reactor Vessel Isolation Control System (PCRVICES) Isolation Functions and Settings," which includes the Main Steam Tunnel and RWCU leak detection temperature switches. The Main Steam Tunnel leak detection system is described as "designed to detect leaks equivalent to 25 gpm water." RWCU leak detection is discussed in this section of the SSES FSAR, but it does not define a leak rate basis for temperature setpoints. Leak duration and process temperature bases are not defined in the SSES FSAR.

In order to evaluate the existing setpoints, temperature calculations were performed for the HPCI, RCIC, RHR and RWCU equipment areas and the HPCI/RCIC Piping Area. The calculations use a computer model to predict the temperature rise resulting from a leak. The results of the temperature calculations provide the design inputs for setpoint calculations for the ambient and differential temperature switches installed in each of the areas.

The calculations for the HPCI, RCIC and RWCU rooms have shown that the temperature rise resulting from a 5 gpm leak is not sufficient to reach the existing setpoints within a reasonable time. Lowering the setpoints to allow timely detection of a 5 gpm leak does not provide sufficient margin above post-LOCA or maximum design temperature and would increase the risk of inadvertent system isolations. Calculations with leak rates of 25 gpm provide setpoints which provide timely leak detection and sufficient margin above maximum design or post LOCA temperatures.

The ambient and differential temperature setpoints proposed by this Technical Specification change incorporates the new basis. The proposed setpoint changes are based on a leakage rate of 25 gpm and process temperature corresponding to full reactor power. Setpoint changes are required for the RWCU penetration room and for the HPCI and RCIC Room cooler temperature switches.

Proposed Temperature Setpoint Design Basis

1. Setpoints are based on room thermal response to a defined design basis leak as predicted by a thermal transient computer model (COTTAP).

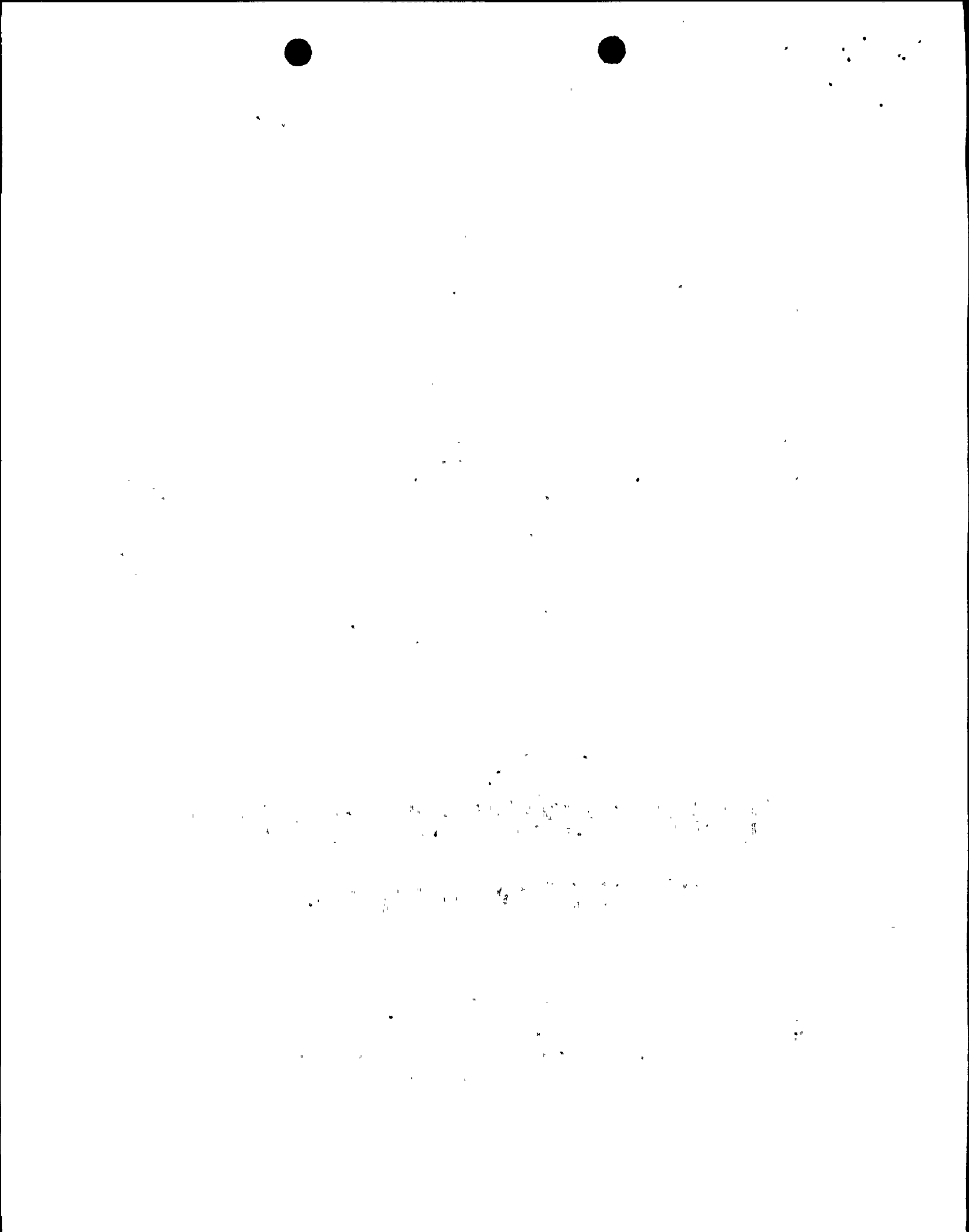
2. Setpoints provide sufficient margin above maximum design operating temperature or post LOCA design temperature to preclude inadvertent system isolation.
3. Setpoints are calculated for leakage at the following process conditions. For the HPCI Equipment Room, RCIC Equipment Room, and HPCI/RCIC Piping Area the leaking fluid is steam at 535°F and 1000 psig. For the RWCU Pump Rooms, the leaking fluid is water at 535°F and 1000 psig and for the RWCU Penetration Room and Heat Exchanger Rooms the fluid is water at 440°F and 1190 psig.
4. Setpoints detect leakage equivalent to 25 gpm water for all areas. The 25 gpm leak basis is also consistent with GE design specifications, with the basis used at other BWR's, and with the Technical Specifications proposed by Technical Specification Improvement.

The safety function of the leak detection instruments is to detect leakage from the Reactor Coolant Pressure Boundary (RCPB) as required by GDC 30, Reg. Guide 1.45 and the Standard Review Plan (NUREG 0800). The purpose of leak detection, as described in FSAR Sections 7.3.1.1a.2.1 and 7.6.1a.4.1, is to prevent the excessive loss of reactor coolant and the release of radioactive material. Temperature monitoring is designed to detect small leaks below the size of a pipe break. The system is thereby intended to provide advance warning of a pipe flaw or other breach in the RCPB and prevent the development of larger scale leak or break conditions.

The proposed Technical Specification change does not affect the ability to detect leakage as required by GDC 30, Reg. Guide 1.45 and the Standard Review Plan (NUREG 0800). The change clearly defines the basis for temperature monitoring. The setpoint bases, including the increase in the nominal leak rate for automatic isolation of the system, does not affect the safety function of the system as a whole. By providing more assurance that inadvertent isolations of systems (ECCS and others) do not occur the overall plant safety is enhanced. The function of the other leak detection instruments is not affected by this change. The leak detection system as a whole continues to satisfy its safety requirements.

NO SIGNIFICANT HAZARDS CONSIDERATION

- I. The proposed change does not involve a significant increase in the probability or consequence of an accident previously evaluated.



The SSES FSAR does not analyze the size of the small leak on which the temperature setpoints are based. Other accidents which result in coolant leakage outside containment are analyzed in FSAR Sections 15.6.2 (Instrument Line Break) and 15.6.4 (Steam System Piping Break Outside Containment). Both of these are assumed accidents, with no causes identified. The analysis in Section 15.6.4 is the enveloping evaluation for pipe breaks outside containment. The proposed 25 gpm leakage rate basis is well below the leakage corresponding to a catastrophic pipe failure for the applicable system piping and does not significantly increase the risk of a break.

The radiological consequences of a coolant leak outside primary containment was analyzed. The analysis concludes that there is no impact on the 10CFR100 offsite dose limits or on the 10CFR50, Appendix A, GDC 19 control room dose limits.

Additionally, the temperature switches and isolation valves are redundant. Failure of a single switch to detect a leak does not preclude detection and, where appropriate, isolation by the other switch and valve. The reliability of the temperature switches is not affected by the setpoint. The other methods of leak detection provide backup for the temperature instruments.

- II. The proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

The proposed technical specification change does not affect any systems other than leak detection and does not affect the ability to detect and isolate leakage. Although a 25 gpm leak is not specifically analyzed in the FSAR, it is bounded by the analysis in Chapter 15.6.4. The proposed change does not, therefore, create the possibility of an accident or malfunction of a different type than any evaluated previously in the FSAR.

- III. The proposed change does not involve a significant reduction in a margin of safety.

The temperature switches and setpoints are listed in Technical Specification Section 3.3.2, "Isolation Actuation Instrumentation," but the Technical Specification basis does not discuss setpoint basis with respect to leakage rate or process conditions. The bases does, however, state "the setpoints ... are established at a level away from the normal operating range to prevent inadvertent actuation of the system involved." Temperature measurement is not discussed in the basis for Technical Specification 3.4.3, "Reactor Coolant System Leakage."

The proposed technical specification change satisfies the bases for Section 3.3.2 by defining that the setpoints margin above maximum design temperatures, but does not reduce any margin of safety defined for any Technical Specification.

Any questions on this submittal should be directed to Mr. C.T. Coddington at (215) 774-7915.

Very truly yours,



H. W. Keiser

cc: NRC Document Control Desk (original)
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