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DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Provides status re implementation of control room fire detection sys.Installation of addl fire detectors delayed due to repeated testing failures.Utilization of in-cabinet detection sys under review.

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April 7, 1982
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Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
CONTROL ROOM FIRE DETECTION IMPLEMENTATION STATUS

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Denton:

This letter is to inform you of the various activities we have pursued to date in attempting to determine the response of the presently installed control room ceiling fire detectors. Our commitment to conduct a test is referenced in Amendment Nos. 31 and 12 to the Facility Operating Licenses of Unit Nos. 1 and 2, respectively, which required us to implement all items in Table 1 of the NRC's Fire Protection Safety Evaluation Report for the Donald C. Cook Nuclear Plant dated June 4, 1979. Item 23 of this Table required us to conduct this control room detector test. The license conditions of Amendment Nos. 31 and 12 have been met in that all items of Table 1 have been implemented, including Item 23. As stated in the SER however, additional detectors were to have been installed by the first refueling of Unit No. 2 if the results of the test indicated that these additional detectors were necessary. Due to problems uncovered during the test, and which are discussed below, the implementation of these detectors has not been performed.

The first test was conducted in May, 1979 by AEPSC Fire Protection personnel and plant personnel. This test failed in that none of the detectors were able to detect the smoke, even though a visible haze was observed and the odor permeated the control room. A second test was conducted in August, 1979 in which the manufacturer (Pyrotronics) also participated. The detectors were cleaned as needed and their sensitivities were checked. In addition, a combustion products meter was utilized to detect the amount of combustion products reaching a detector. The test was conducted at three locations using the guidelines of UL217 for the heat source, burn material, and arrangement. The test failed at all three locations except for a variation in which the test assembly (smoke generator) was moved close to a detector. The presence of the smoke during the test was very pronounced as to odor and visibility. It was observed during the test

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that the smoke never entered the ionization sampling chambers of the detectors due to air flow paths created by the control room ventilation units.

Following the second test, attempts were made to find a detecting device that could perform in the environment of the control room and still have the sensitivity to detect minimum quantities of smoke. In the last quarter of 1980, a projected beam smoke and heat detector manufactured by the Chubb Co. of England, was considered for use. In March, 1981 the first Chubb detector test was scheduled. The test was subsequently cancelled due to defective equipment and problems encountered in aligning the beam. A test was subsequently conducted in May, 1981 with the equipment operable and aligned. This test failed due to smoke dilution resulting from the air flow conditions in the control room.

We are investigating a number of in-cabinet detection systems. These include additional ionization detectors, a linear heat sensor, rate compensation fire detectors, and a tubing-type air sampling system. We have found that implementation of an in-cabinet detection system is extremely difficult due to the limited space within the cabinets and the control room and due to the fact that if detectors are installed in these cabinets, or if the cabinets are modified, the cabinet qualification may be affected. We will keep you informed of the situation and would appreciate any comments or suggestions you may have on the subject.

We will be installing additional ionization detectors in the control room approximately 6 to 12 inches below the ceiling which should place them in the smoke stratum, below the air flow paths created by the control room ventilation units. Also, we will be lowering several existing detectors from their present positions to be located in the smoke stratum. We intend to continue testing to ascertain whether a simulated fire in a closed cabinet is capable of being detected by these detectors at elevations within the smoke stratum.

All of the above notwithstanding, we still believe that the continuous presence of the operators in the control room is the most reliable fire detection system. This belief has been confirmed in each of the tests performed, since the operators present detected the smoke very quickly and decisively.

This document has been prepared following Corporate Procedures which incorporate a reasonable set of controls to insure its accuracy and completeness prior to signature by the undersigned.

Very truly yours,

R. F. Hering
Vice President

/md

cc: John E. Dolan - Columbus
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