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U. S. Nuclear Regulatory Commission
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Mail Stop O-P1-17
Washington, D. C. 20555-0001

Donald C. Cook Nuclear Plant Units 1 and 2
SUPPLEMENTAL INFORMATION
ON LICENSE AMENDMENT REQUEST
FOR CONTROL ROOM HABITABILITY
(TAC Nos. MA9394 and MA9395)

Reference: Letter from R. P. Powers (I&M) to U. S. Nuclear Regulatory Commission Document Control Desk, "Donald C. Cook Nuclear Plant Units 1 and 2, License Amendment Request for Control Room Habitability and Generic Letter 99-02 Requirements," submittal C0600-13, dated June 12, 2000.

In the referenced letter, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant Units 1 and 2, proposed to amend Facility Operating Licenses DPR-58 and DPR-74. In accordance with the requirements of 10 CFR 50.67, I&M proposed to apply the alternative source term (AST) described in NUREG-1465 to the control room dose analysis. I&M also proposed to amend the Unit 1 and Unit 2 technical specifications (T/S) in support of the revised control room dose analysis. Implementation of the proposed T/S changes and the AST analytical assumptions, methodology, and acceptance criteria are required to demonstrate full compliance with control room habitability requirements specified in 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 19.

Attachment 1 to this letter provides supplemental information to fulfill two regulatory commitments made in the referenced letter. First, I&M committed to provide a supplement to the license amendment request addressing the consequences of a locked reactor coolant pump rotor event for Unit 1. I&M committed to submit this supplement prior to Unit 1 entering Mode 2. Attachment 1, herein, presents the results of the Unit 1 cycle-specific analysis demonstrating that no fuel rods would experience departure from nucleate boiling

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for a locked rotor event during the upcoming Unit 1 operating cycle (Unit 1 Fuel Cycle 17). These results demonstrate that the locked rotor event analysis documented in the referenced letter is valid for the upcoming Unit 1 operating cycle. The locked rotor event analysis documented in the referenced letter demonstrated that the dose to control room operators would be within the limits of GDC-19, using the AST.

Second, I&M committed to finalize the evaluations of postulated single failures for the control room emergency ventilation system emergency inlet dampers and provide a supplement to the referenced license amendment request if the revised doses differed significantly from the values provided in Attachment 6 of that submittal. Although the revised doses calculated by this single failure evaluation do not differ significantly from the calculated doses previously reported in the referenced letter, a summary of the evaluation results is provided in Attachment 1 demonstrating fulfillment of this commitment.

I&M has reviewed the supplemental information provided by this letter and concludes that the evaluation of significant hazards considerations contained in the referenced letter is not affected.

Attachment 2 documents a commitment made in this letter.

Should you have any questions, please contact Mr. Wayne J. Kropp, Director of Regulatory Affairs, at (616) 697-5056.

Sincerely,

M. W. Rencheck
Vice President Nuclear Engineering

/dmb

Attachments

c: J. E. Dyer
MDEQ – DW & RPD, w/o attachment
NRC Resident Inspector
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ATTACHMENT 1 TO C1100-10

SUPPLEMENTAL INFORMATION ON LICENSE AMENDMENT REQUEST FOR CONTROL ROOM HABITABILITY

Background

In the referenced letter, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant Units 1 and 2, proposed to amend Facility Operating Licenses DPR-58 and DPR-74. In accordance with the requirements of 10 CFR 50.67, I&M proposed to apply the alternative source term (AST) described in NUREG-1465 to the control room dose analysis. I&M also proposed to amend the Unit 1 and Unit 2 technical specifications (T/S) in support of the revised control room dose analysis. Implementation of the proposed T/S changes and the AST analytical assumptions, methodology, and acceptance criteria are required to demonstrate full compliance with control room habitability requirements specified in 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 19.

This letter provides supplemental information to fulfill two regulatory commitments made in the referenced letter. First, I&M committed to provide a supplement to the license amendment request addressing the consequences of a locked reactor coolant pump (RCP) rotor event for Unit 1. I&M committed to submit this supplement prior to Unit 1 entering Mode 2. The results of the Unit 1 cycle-specific analysis demonstrating that no fuel rods would experience departure from nucleate boiling for a locked rotor event occurring during the upcoming Unit 1 operating cycle (Unit 1 Fuel Cycle 17) are presented herein under the heading, "Locked Rotor Event - Unit 1 Cycle 17 Departure from Nucleate Boiling (DNB) Analysis." These results demonstrate that the locked rotor event analysis documented in the referenced letter is valid for the upcoming Unit 1 operating cycle. The locked rotor event analysis documented in the referenced letter demonstrated that the dose to control room operators would be within the limits of GDC-19, using the AST.

Second, I&M committed to finalize the evaluations of postulated single failures for the control room emergency ventilation system (CREVS) emergency inlet dampers and provide a supplement if the revised doses differed significantly from the values provided in Attachment 6 to the referenced letter. Although the revised doses calculated by this single failure evaluation do not differ significantly from the calculated doses reported in the referenced letter, a summary of the results of the evaluation is provided under the heading, "Single Failure Evaluation for Control Room Emergency Ventilation System" to demonstrate fulfillment of this commitment.

Locked Rotor Event - Unit 1 Cycle 17 Departure from Nucleate Boiling (DNB) Analysis

Reference 1 included the results of new dose analyses using the AST. The new analyses calculated the dose consequences to control room personnel for loss-of-coolant accident (LOCA) and non-LOCA events, including the locked rotor event (Updated Final Safety Analysis Report Section 14.1.6). The analysis of the locked rotor event demonstrated that adequate radiation protection is

provided to permit control room occupancy without personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent (TEDE).

In the analysis of a locked rotor event, an instantaneous seizure of an RCP rotor is assumed to occur, which rapidly reduces flow through the affected reactor coolant loop. No cladding failure was postulated in the locked rotor event analysis summarized in the referenced letter because the calculated peak cladding temperature did not exceed 2700°F. However, the licensing basis analysis for a Unit 2 locked rotor event relies on the DNB ratio as a cladding failure criterion. Therefore, a cycle-specific analysis was performed demonstrating that no fuel rods would experience DNB in a locked rotor event during the current Unit 2 operating cycle (Unit 2 Fuel Cycle 12). This was documented in the referenced letter.

To maintain consistency with the Unit 2 licensing basis analysis, I&M committed in the referenced letter to provide a supplement addressing the locked rotor event for Unit 1. The Unit 1 analysis has subsequently been completed demonstrating that no rods would experience DNB for a locked rotor event during Unit 1 Fuel Cycle 17. As a result, the dose consequences described the referenced letter are valid for Unit 1 during Fuel Cycle 17. I&M will continue to conduct cycle-specific reviews of Unit 1 locked rotor events to demonstrate that the event would not result in control room doses that exceed the 5 rem TEDE limits of 10 CFR 50.67.

Single Failure Evaluation for Control Room Emergency Ventilation System

The CREVS was not designed to meet single failure criterion. Nevertheless, I&M has historically evaluated the impact of postulated single failures on the capability of the CREVS to mitigate doses to control room operators. Although I&M has performed modifications to eliminate previously analyzed single failures, new postulated single failures have been identified involving the modified emergency inlet dampers. Prior to submittal of the revised control room dose analyses in the referenced letter, a preliminary evaluation was conducted to estimate the effects of these failures on the calculated radiological doses. This preliminary evaluation indicated that doses for two accidents (small break (SB) LOCA and rod ejection accident) would be above the reported values, but well within the requirements of 10 CFR 50.67. I&M committed to complete the single failure evaluation and provide the results of the evaluation to the Nuclear Regulatory Commission if the final doses differed significantly from the values given in the referenced letter. I&M committed to complete this activity prior to Unit 1 entry into Mode 2.

I&M has completed the CREVS single failure evaluation. This evaluation determined the effect of damper single failures on the event analyses that rely on automatic isolation of normal control room ventilation and automatic actuation of the CREVS emergency mode. These are the analyses for a large break (LB) LOCA, SBLOCA, rod ejection event, steam generator tube rupture (SGTR) event, and steam line break event. The single failure evaluation analyzed two potential damper failure configurations for the emergency ventilation inlet dampers. In the first configuration, it is assumed that one of two parallel control room pressurization/cleanup filter unit vent fans is in continuous operation throughout the duration of the event. In the second configuration, it is assumed that two

fans are initially started, with one fan being manually shut down after the initiation of the event. Both cases assume one of the two parallel emergency ventilation inlet dampers fails full open and remains full open for the duration of the event.

To determine the impact of the damper failure, the control room doses were calculated for the five events identified above assuming each of the two damper failure configurations. The CREVS single failure evaluation uses the AST assumptions and methodologies. The following table compares the control room doses reported in the referenced letter to the control room doses with a damper failure. In all cases, the control room dose calculated with a damper failure is greater than the dose calculated without a damper failure. However, for LBLOCA and SGTR, doses indicated in the table for the damper failure conditions are the same as those reported in the referenced letter. This is because the doses reported in the referenced letter were conservatively "rounded up." The calculated doses were actually slightly less than indicated in the referenced letter.

Final Calculated Control Room Doses

Event	Control Room Dose reported in Reference 1 TEDE Dose (rem)	Control Room Dose with damper failure TEDE Dose (rem)
LBLOCA	2.0	2.0
SBLOCA	1.6	1.9
Rod Ejection	2.8	3.2
SGTR - Pre-Accident Iodine Spike - Accident-Initiated Iodine Spike	 0.4 0.2	 0.4 0.2
Steam Line Break - Pre-Accident Iodine Spike - Accident-Initiated Iodine Spike	 0.11 0.4	 0.12 0.5

In conclusion, I&M does not consider the effect of the damper failure evaluation on the calculated doses presented in the referenced letter to be significant because the rod ejection accident remains the dose-limiting event for personnel in the control room and all calculated doses remain below the 5 rem TEDE limit specified in 10 CFR 50.67.

Reference

1) Letter from R. P. Powers (I&M) to Nuclear Regulatory Commission Document Control Desk, "Donald C. Cook Nuclear Plant Units 1 and 2, License Amendment Request for Control Room Habitability and Generic Letter 99-02 Requirements," submittal C0300-16, dated June 12, 2000.

ATTACHMENT 2 TO C1100-10

COMMITMENTS

The following table identifies those actions committed to by Indiana Michigan Power Company (I&M) in this submittal. Other actions discussed in the submittal represent intended or planned actions by I&M. They are described to the Nuclear Regulatory Commission (NRC) for the NRC's information and are not regulatory commitments.

Commitment	Date
I&M will continue to conduct cycle-specific reviews of Unit 1 locked rotor events to demonstrate that the event would not result in control room doses that exceed the 5 rem TEDE limits of 10 CFR 50.67.	Prior to the start of each fuel cycle.