



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 141 TO FACILITY OPERATING LICENSE NO. DPR-58  
AND AMENDMENT NO. 128 TO FACILITY OPERATING LICENSE NO. DPR-74

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-315 AND 50-316

1.0 INTRODUCTION

By letter dated September 22, 1989, Indiana Michigan Power Company (the licensee) requested approval of amendments to the D. C. Cook, Units 1 and 2 plant Technical Specifications (TS). The amendments propose to add an exemption from TS 4.0.4 requirements for the 18-month measurement of hot-leg to cold-leg differential temperature ( $\Delta T$ ). This proposal would permit the licensee to measure and calibrate the  $\Delta T$  inputs to the overpower  $\Delta T$  and overtemperature  $\Delta T$  calculators after reaching rated thermal power. The amendments also propose an editorial change to Note 9 of TS Table 4.3-1, "Reactor Trip System Instrumentation Surveillance Requirements."

2.0 DISCUSSION

During the last Unit 2 refueling outage, all four steam generators were replaced. During the subsequent start-up and power ascension, the licensee discovered that the flow characteristics of the new steam generators were such that the flow distribution between the reactor coolant loops changed when the reactor was taken from the hot standby condition to full power. This change in flow distribution caused the loop 2 differential temperature instrumentation to indicate a reactor power (based on  $\Delta T$ ) several percent lower than the other loops. This event was reported to the NRC in LER 89-010, dated May 24, 1989.

In the past, the  $\Delta T$  measurements were made before entry into Mode 2, as TS Table 3.3-1, "Reactor Trip System Instrumentation," requires that the overpower and overtemperature  $\Delta T$  trips be operable in Modes 1 and 2. However, since the flow distribution of the reactor coolant loops changes from hot standby to full power, calibration of the  $\Delta T$  instrumentation before start-up does not provide adequate assurance of the proper function of the associated trip functions during high power operation. Therefore, the associated reactor trip functions, namely the overpower and overtemperature  $\Delta T$  trips, could be considered inoperable until the loop  $\Delta T$  measurements and recalibrations were performed at rated thermal power (RTP). TS 4.0.4, "Applicability," prohibits the licensee from entering an Operational Mode unless all specified applicability conditions have been performed within the specified surveillance interval.

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As a result of the LER, the licensee had previously committed to measure individual loop delta T at the beginning of each fuel cycle and to recalibrate the delta T instrumentation during the operating cycle as necessary to reflect steam generator tube plugging or reactor coolant pump flow changes. The licensee had previously requested, and received, TS amendments which provided exemptions from TS 4.0.4 requirements for the F delta I penalties associated with the overpower and overtemperature delta T trips. The licensee has now proposed that similar exemptions from TS 4.0.4 requirements be granted for the measurement of the loop delta T inputs to the overpower and overtemperature delta T trips.

The amendments also propose to change Note 9 of TS Table 4.3-1 to refer generally to TS Table 2.2-1, "Reactor Trip System Instrumentation Trip Setpoints." Note 9 of Table 4.3-1 refers to several notes in Table 2.2-1 and this change enhances readability.

### 3.0 EVALUATION

The overpower and overtemperature delta T trips provide protection from violation of linear power density (kW/ft) and departure from nucleate boiling ratio (DNBR) limits, which were established to prevent damage to the fuel or its cladding. These trip functions utilize a relationship between loop differential temperature and reactor power. The trip units use calculators to compare measured loop delta T to trip set points calculated from the nominal loop delta T for rated thermal power. Penalties are assessed by the calculators for deviations of Tave, F delta I and other inputs from nominal values. The trip functions were designed to protect the reactor from relatively slow transients initiated from near 100% rated thermal power, such as uncontrolled boron dilution, slow control withdrawal, small steamline breaks, or RCS depressurization due to a small break LOCA. As such, these trips are not effective in mitigating transients during start-up and power ascension.

The proposed amendments would permit the licensee to perform the loop delta T measurements and calibrations at rated thermal power. As the overpower and overtemperature delta T trips perform very little function during start-up and power ascension, the safety impact of this amendment is minimal during these phases of operation. During power operation near 100% RTP, redundant reactor trip functions, such as the high set point power range neutron flux (PRNF), low pressurizer pressure, and low reactor coolant flow trips provide a large degree of protection from transients which could cause fuel cladding damage. Therefore, the safety impact of this proposal upon power operation is also minimal.

The remaining change is editorial in nature and improves the readability of the Technical Specifications.

Based on the above evaluation, the staff concludes that the licensee's proposed Technical Specification amendments, as delineated in the September 22, 1989, letter is acceptable.

### 4.0 ENVIRONMENTAL CONSIDERATION

These amendments involve changes in a requirement with respect to the installation or use of a facility component located within the restricted area as



defined in 10 CFR Part 20 and changes in a surveillance requirement. We have determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

#### 5.0 CONCLUSION

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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