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INDIANA
MICHIGAN
POWER

September 1, 2000

C0900-09
10 CFR 50.90

Docket No.: 50-316

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Washington, DC 20555-0001

Donald C. Cook Nuclear Plant Unit 2
LICENSE AMENDMENT REQUEST
CHANGES TO A MODERATOR TEMPERATURE COEFFICIENT VALUE
ASSUMED IN CERTAIN TRANSIENT ANALYSES

Pursuant to 10 CFR 50.90, Indiana Michigan Power Company (I&M), the Licensee for Donald C. Cook Nuclear Plant Units 1 and 2, proposes to amend the Unit 2 Facility Operating License, DPR-74. I&M has revised Unit 1 and 2 safety analyses to incorporate changes regarding modeling of pressurizer heater operation and spray effectiveness as they relate to certain transients that are analyzed for pressurizer overfill. As a part of the revision to the Unit 2 analyses only, I&M proposes to change the value of the moderator temperature coefficient (MTC) assumed as an initial condition for these transients. I&M is seeking approval, therefore, on its use of a different value for MTC as an input assumption for analyses of these transients on Unit 2.

The affected Unit 1 and Unit 2 analyses involve the loss of all non-emergency alternating current power (LOAC) and loss of normal feedwater (LONF) transients. To model these transients more accurately, the LOAC and LONF pressurizer overfill analyses have been revised to: 1) model the pressurizer heaters; and 2) increase the assumed effectiveness of the pressurizer spray at higher pressurizer water levels. For Unit 2 only, the assumed MTC is proposed to be revised from the currently assumed value of +5 percent millirho per degree Fahrenheit (pcm/°F) to 0 pcm/°F. Because this change in MTC is non-conservative relative to the value assumed in safety analyses credited in

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previous Nuclear Regulatory Commission (NRC) safety evaluation reports, this analytical assumption change for Unit 2 was determined to involve an unreviewed safety question. Therefore, NRC staff review and approval of the Unit 2 MTC analysis input assumption is required in accordance with 10 CFR 50.90.

Attachment 1 provides a detailed description of the proposed changes. Attachment 2 describes the evaluation performed in accordance with 10 CFR 50.92(c), which concludes that no significant hazard is involved. Attachment 3 provides the environmental assessment.

I&M requests approval of this request by November 15, 2000.

Copies of this letter and its attachments are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality, in accordance with the requirements of 10 CFR 50.91.

Should you have any questions, please contact Mr. Wayne J. Kropp, Director of Regulatory Affairs, at (616) 466-2447.

Sincerely,

M. W. Rencheck
Vice President Nuclear Engineering

/dmb

Attachments

c: J. E. Dyer
MDEQ - DW & RPD
NRC Resident Inspector
R. Whale

AFFIRMATION

I, Michael W. Rencheck, being duly sworn, state that I am Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company

M. W. Rencheck
Vice President Nuclear Engineering

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 1 DAY OF September, 2000

Danielle M. Schrader
Notary Public

My Commission Expires April 4, 2004

DANIELLE M. SCHRADER
Notary Public, Berrien County, MI
My Commission Expires Apr 4, 2004

ATTACHMENT 1 TO C0900-09

DESCRIPTION OF THE PROPOSED ANALYSIS CHANGES

A. Summary of the Proposed Changes

Indiana Michigan Power Company (I&M), the Licensee for Donald C. Cook Nuclear Plant (CNP) Units 1 and 2, proposes to amend the Unit 2 Facility Operating License, DPR-74. I&M has revised analyses regarding modeling of pressurizer heater operation and spray effectiveness as they relate to certain transients analyzed for pressurizer overfill. As a part of the revision to the Unit 2 analyses only, I&M proposes to revise the moderator temperature coefficient (MTC) assumed as an initial condition for these transients. Since the revised MTC is non-conservative relative to the value assumed in safety analyses credited in previous Nuclear Regulatory Commission (NRC) Safety Evaluation Reports (SER), I&M is seeking approval on its use of a different value for MTC as an input assumption for analyses of these transients on Unit 2.

The Unit 1 and Unit 2 analyses that required revision involve the loss of all non-emergency alternating current power (LOAC) and loss of normal feedwater (LONF) transients. To model these transients more accurately, the LOAC and LONF pressurizer overfill analyses have been revised to: 1) model the pressurizer heaters, and 2) increase the assumed effectiveness of the pressurizer spray at higher pressurizer water levels. For Unit 2 only, the assumed MTC is proposed to be revised from the currently assumed value of +5 percent millirho per degree Fahrenheit (pcm/°F) to 0 pcm/°F. Because this change in MTC is non-conservative relative to the value assumed in previous NRC analyses, this analytical assumption change for Unit 2 was determined to involve an unreviewed safety question (USQ). Therefore, NRC staff review and approval of the Unit 2 MTC analysis input assumption is required in accordance with 10 CFR 50.90. These changes are described in detail below.

I&M has revised the Unit 1 and Unit 2 LOAC and LONF analyses to model the effects of pressurizer heaters on pressurizer water level. This change provides consistency with CNP analysis methodology by including an input assumption regarding pressurizer heater operation that will yield more conservative analytical results. In Nuclear Safety Advisory Letter (NSAL) 98-007 (Reference 1), Westinghouse Electric Company (Westinghouse) identified the need to incorporate this modeling assumption. NSAL-98-007 identified that when the heaters are modeled in the analyses of pressurizer fill events, they could make the transient results more limiting by increasing the rate at which the pressurizer fills. The increased pressurizer fill rate could result in an earlier predicted occurrence of the maximum pressurizer level during the transient, which could result in a water-solid pressurizer condition (i.e., pressurizer overfill).

I&M has also revised the Unit 1 and Unit 2 LOAC and LONF analyses to incorporate a change to the modeling of pressurizer spray for the analysis of these transients. This change corrects a potentially non-conservative modeling assumption with respect to the effectiveness of the spray at pressurizer water levels approaching a water-solid pressurizer condition (i.e., > 90% volume). The need to change this modeling assumption was also identified in NSAL-98-007.

I&M proposes to change the MTC value assumed in the Unit 2 LOAC and LONF analyses from the currently assumed partial-power value of +5 pcm/°F to the full-power value of 0 pcm/°F. This input assumption change is requested to achieve acceptable results for the pressurizer fill analysis for these two transients when analyzed for Unit 2.

The proposed changes are described in detail in Section D of this attachment.

B. Description of the Current Requirements

Updated Final Safety Analysis Report (UFSAR) Section 14.1.9, "Loss of Normal Feedwater Flow" summarizes the analysis of the LONF event for Units 1 and 2. This transient is postulated to occur as a result of pump failures, valve malfunctions, or a loss of offsite alternating current power. The LONF transient is characterized by a reduction in capability of the secondary system to remove the heat generated in the reactor core. The LOAC transient, summarized in UFSAR Section 14.1.12, "Loss of Offsite Power (LOOP) to the Station Auxiliaries," is postulated to be caused by a complete loss of the offsite grid accompanied by a turbine trip at the station, or by loss of the onsite alternating current (AC) power distribution system. Like the LONF transient, a LOAC transient may also result in a reduction in the capability to remove heat from the reactor core, but in this case due to a loss of all power to the plant auxiliaries.

The analyses for these postulated transients use the LOFTRAN code to model the plant response. LOFTRAN computes pertinent variables, including the pressurizer water level. Pressurizer sprays and pressurizer heaters are control systems designed for the primary function of controlling pressurizer pressure. The current analyses assume pressurizer sprays operate throughout the transient at their maximum flow rate. This assumption maximizes the pressurizer water level, thereby increasing the calculated potential for a water-solid pressurizer condition. Continuous pressurizer spray is also assumed to affect pressurizer pressure throughout the transient and is thereby assumed to have a continuous effect on pressurizer level until the maximum, calculated pressurizer level is achieved. The analyses do not currently assume operation of the pressurizer heaters. The Unit 1 and Unit 2 analyses for these transients assume an MTC of +5 pcm/°F at 102 percent power. The safety analyses for both transients demonstrate that pressurizer overfill does not occur.

C. Bases for the Current Requirements

Nuclear plants are designed to ensure they can be operated safely even if highly unlikely occurrences, or faults, are postulated. The analyses that demonstrate the capability of the plant to mitigate such events are summarized in the Safety Analysis chapter of the UFSAR. The analyses are classified based upon the anticipated frequency of occurrence. There are four American Nuclear Society (ANS) fault conditions, with the most frequent Condition I events representing normal operational occurrences and the least frequent Condition IV occurrences representing faults that are not expected to take place. ANS Condition II occurrences, such as the LOAC and LONF transients, are faults that may occur with moderate frequency during the life of the plant.

The safety analyses are performed to demonstrate that the applicable safety analysis criteria for these events are met. The applicable criteria for these Condition II events are:

1. They are accommodated with, at most, a reactor shutdown and the plant being capable of returning to operation after a corrective action.
2. No ANS Condition II occurrence shall cause consequential loss of function of fuel cladding and reactor coolant system (RCS) barriers.

To show compliance with criterion 2, safety analyses are performed using conservative input assumptions to demonstrate that pressurizer overfill will not occur. Precluding a water-solid pressurizer condition ensures that water is not discharged from the pressurizer safety valves or power-operated relief valves (PORVs). Discharge of water through these valves could result in damage to the valves and render the RCS pressurizer boundary incapable of isolation. Such a condition would violate criterion 2.

The analyses of plant transients are based on a set of conservative assumptions pertaining to initial plant conditions, equipment capabilities, and whether equipment is credited in mitigating the event. Plant process control systems are not credited in the analysis of non-loss-of-coolant accident (non-LOCA) events or transients unless normal operation of the control system leads to more limiting analysis results. Conversely, no credit is taken in the safety analyses for control systems that would improve analysis results.

D. Need for Revision of the Requirement

Westinghouse notified I&M of modeling issues regarding operation of the pressurizer heaters and spray effectiveness as they relate to events analyzed for pressurizer overfill in NSAL-98-007. Pressurizer heaters have not been previously modeled in non-LOCA safety analyses. NSAL-98-007 identified that when the heaters are modeled in the analyses of transients that can result in pressurizer overfill, they potentially make the transient results more limiting by contributing to the thermal expansion of the water in the pressurizer. Additionally, NSAL-98-007 identified a potential non-conservative modeling assumption with respect to the

effectiveness of the pressurizer sprays at pressurizer levels approaching a water-solid pressurizer condition (i.e., >90% volume). Westinghouse, in its initial announcement of these modeling deficiencies sent to all utilities (Reference 1), stated that for transients analyzed for pressurizer overfill, modeling an increased effectiveness of the pressurizer sprays at higher pressurizer water levels reduces the time to reach the maximum, calculated pressurizer level during the transient and may result in violating the analysis criterion. I&M has subsequently determined, however, that the revised input assumptions, taken individually and as a whole, are appropriate and conservative and, as explained below, do not result in violating the analysis criteria.

Implementation of the proper modeling for pressurizer heaters and sprays in the Unit 1 LOAC and LONF analyses confirm that all acceptance criteria continue to be met; in particular, the pressurizer overfill does not occur. However, to meet the acceptance criteria for the Unit 2 analyses, the assumed MTC was changed from the partial-power value of +5 pcm/°F to the full power value of 0 pcm/°F. While this change in Unit 2 MTC value is consistent with the full power value assumed in Unit 2 Technical Specifications (T/S) and the Core Operating Limits Report, the need to assume a less conservative MTC value as an input for the LOAC and LONF transient analyses than that assumed in safety analyses credited in previous NRC SERs was determined to involve a USQ. Therefore, NRC staff review and approval of the revised MTC input assumption is required in accordance with 10 CFR 50.90.

E. Description of the Proposed Changes

The LONF analysis is summarized in UFSAR Section 14.1.9, "Loss of Normal Feedwater Flow" and the LOAC analysis is summarized in UFSAR Section 14.1.12, "Loss of Offsite Power (LOOP) to the Station Auxiliaries." The changes that have been implemented for the safety analyses for the LONF and LOAC transients are:

1. The pressurizer heaters have been modeled in the Unit 1 and Unit 2 LOAC and LONF transients.
2. The non-conservative modeling assumption with respect to the effectiveness of the pressurizer spray at pressurizer levels approaching a water-solid pressurizer condition has been corrected in the LOFTRAN computer code. The Unit 1 and Unit 2 LOAC and LONF transients were re-analyzed assuming an increased pressurizer spray effectiveness at higher pressurizer water levels.

As a result, I&M proposes to reduce the MTC value used in the Unit 2 LOAC and LONF analyses from +5 pcm/°F to 0 pcm/°F at 102% of full power. The analyses have been completed using this proposed change, and demonstrate that all acceptance criteria are met.

A UFSAR change has been prepared to reflect the analytical changes addressed in this submittal.

F. Bases for the Proposed Changes

The proposed change would affect the analyzed RCS response postulated for LOAC and LONF transients. In response to the concerns identified in NSAL-98-007, Westinghouse re-assessed the pressurizer fill analyses for these two transients. For both units, the revised input parameters pertaining to pressurizer heaters and sprays are assumed (i.e., operation of pressurizer heaters and increased effectiveness of pressurizer sprays). Additionally, the Unit 2 assessment includes the revised MTC value.

Operational occurrences that are postulated to occur on a moderate frequency, such as the LOAC and LONF transients, are analyzed to ensure they do not generate a more serious plant condition without other faults occurring independently. Specifically, these events are analyzed to ensure that pressurizer overfill would not occur. If pressurizer overfill occurs, liquid could pass through the PORVs or the safety valves. Since these valves are qualified to pass steam rather than liquid, there is a potential that overfill could fail one of these valves in the open position, resulting in an uncontrolled release of primary coolant. An uncontrolled release of primary coolant through a failed open relief or safety valve would be considered a small break loss-of-coolant accident (SBLOCA). Because a loss-of-coolant accident is a more serious condition than a LOAC or LONF transient, this would constitute a violation of the acceptance criterion for this type of transient, as discussed above. The changes already implemented affect the approach to modeling the pressurizer heaters and sprays in the accident analysis. The proposed Unit 2 MTC change affects an input assumption to the analyses, but none of these changes result in a revision to the acceptance criteria for or a change in the probability of occurrence of these events. The results of these revised analyses, as tabulated below, confirm that pressurizer overfill would not occur for either event.

Unit 1
Pressurizer Capacity with Surge Line - 1843.35 cubic feet (ft^3)

	UFSAR	Revised Assessment
LONF	1604 ft^3	1656 ft^3
LOAC	1800 ft^3	1670 ft^3

Unit 2
Pressurizer Capacity with Surge Line - 1898.66 ft^3

	UFSAR	Revised Assessment
LONF	1827 ft^3	1840 ft^3
LOAC	1784 ft^3	1719 ft^3

By demonstrating that neither transient would result in a pressurizer overfill, the occurrence of a consequential loss of RCS barrier function would be precluded. As Condition II events do not result in releases of RCS to the containment, and the LOAC and LONF transients would not generate a more serious plant condition, the radiological consequences of these transients would be unchanged and remain negligible.

The change to assume the operation of the pressurizer heaters in the analysis of the LOAC and LONF events is consistent with CNP analysis methodology. Consideration of the effect of control systems on the transient analysis has always been part of the analysis methodology; however, previous modeling did not incorporate the effects of the pressurizer heater system. Since operation of the pressurizer heaters has been determined to result in a conservative penalty with respect to overfill and is consistent with our analysis methodology, it will now be assumed in the analyses. This is a conservative change in an input assumption that causes more limiting analysis results and is consistent with the modeling of plant process control systems in the analysis of non-LOCA transients.

The change to the pressurizer spray modeling assumption is a correction in an existing analysis assumption in the LOFTRAN computer code. The pressurizer sprays were assumed in the current analyses to maximize the water volume in the RCS but they did not accurately model performance at very high pressurizer levels (i.e., > 90%). The revised analyses correct this non-conservative modeling assumption. This is a correction to an input assumption that also causes more limiting analysis results and is also consistent with the modeling of plant process control systems in the analysis of non-LOCA transients.

However, the effect of revising only the pressurizer heater and spray parameters in the Unit 2 LOAC and LONF analyses without a corresponding change to the input assumption regarding MTC value is that the revised analyses results would not preclude the occurrence of a pressurizer overfill. To obtain acceptable results for Unit 2, it is necessary to reduce the MTC assumed in the LOAC and LONF analyses from +5 pcm/°F to 0 pcm/°F at 102% of full power. With this change, the acceptance criteria for these analyses are still met (i.e., a pressurizer overfill event is not postulated to occur), even given the other modeling changes for these transients.

Historically, a positive MTC has been assumed in analyses of these transients in support of previously submitted CNP license amendments (References 2-5). In Reference 4, the NRC approved the current Unit 2 T/S 3/4.1.1.4 MTC curve. This curve allows a constant MTC of +5 pcm/°F for core power levels from 0% to 70%. Above 70% power, the allowed MTC value ramps down linearly to 0 pcm/°F at full power. The basis for NRC approval of the changed MTC curve was that the safety analysis assumptions would remain valid, and thus, the revised curve with a linear MTC reduction from 70% to 100% core power would be bounded by previous safety analyses.

Although the revised Unit 2 MTC value assumed for the LOAC and LONF transient analyses is reduced from that assumed in the current analysis of record (as described in the UFSAR), it is still within the requirements of Unit 2 T/S 3.1.1.4 for 100% power. Thus, the revised MTC value remains bounding for full-power operation. Furthermore, the accident analyses for the LONF and LOAC scenarios both assume an initial reactor power of 102%, which also bounds full power operation. Therefore, the change to the assumption for the Unit 2 MTC ensures that the assumed conditions for the event evaluation still bounds the most limiting plant operating conditions captured in T/S 3.1.1.4. Thus, the basis for approval of the current Unit 2 MTC curve, as specified by the Reference 4 SER, remains valid.

Reference 5 approved the transition to Westinghouse 17×17 Vantage 5 fuel, similar to the fuel currently used in the Unit 2 reactor core. The Reference 5 SER notes that if a positive MTC is intended for Vantage 5, the same positive MTC, consistent with the plant T/S, should be used in the plant-specific safety analysis. The NRC found the positive MTC condition satisfactory, based upon I&M's affirmation of this condition. The proposed change uses the full-power MTC value as the assumed input value for analysis of transients that are most severe at full power. Although this is not the same positive MTC assumed for Vantage 5 fuel at power levels below 70%, the use of the full-power MTC is consistent with the plant T/S. Westinghouse conducted a sensitivity study to confirm that the basis for establishing an MTC of 0 pcm/°F at full power bounds partial-power conditions with the corresponding positive MTC. Specific LOAC and LONF calculations were performed by varying (reducing) the nominal core power levels and assuming corresponding increasingly positive MTC values at each core power level. The result of the study confirmed that, for both the LOAC and LONF events, assuming full power with an MTC value of 0 pcm/°F bounds the case with a positive MTC initialized at a lower power level.

Therefore, although the proposed MTC assumed in the LOAC and LONF analyses is a reduction in the margin assumed in the UFSAR initial conditions for these analyses and is a reduction in margin in analyses of MTC provided for NRC evaluation, the use of the full-power MTC is consistent with the plant T/S and is bounding for full-power operation and partial-power operation at the corresponding MTC value allowed by the plant T/S.

G. Impact on Previous Submittals

By Reference 6, I&M requested a change to Unit 1 and Unit 2 T/S 3/4.4.4, "Pressurizer," to reflect the current power supply to the pressurizer heaters and to require action in all conditions involving inoperable pressurizer heaters. The changes proposed by Reference 6 are necessary to reflect the current configuration of the pressurizer heater electrical power supply and to provide assurance that the pressurizer heater function will be performed when required. The evaluation of no significant hazards supporting the T/S changes proposed by Reference 6 indicates that the pressurizer heaters are not required to mitigate the consequences of any accidents. Although the changes that have already been implemented as described in this submittal include assuming

operation of the pressurizer heaters in the analyses for the LOAC and LONF transients, these revised assumptions are included for conservatism only. Operation of the heaters is not required to mitigate the consequences of these events. Therefore, the changes that have already been implemented as described in this submittal do not affect those proposed by Reference 6. Furthermore, the revised LOAC and LONF analyses summarized in this submittal conservatively model the design heater capacity, rather than the minimum T/S required capacity. This assumption ensures the accident analyses bound the actual plant response to these transients; therefore, the changes proposed by Reference 6 have no effect on the revised LOAC and LONF analyses addressed in this submittal.

No other previous submittals are affected by this request.

References

1. Westinghouse Electric Company (Westinghouse), "Nuclear Safety Advisory Letter (NSAL) 98-007; Analysis Modeling of Pressurizer Heaters," dated August 11, 1998
2. Letter from S. A. Varga (NRC) to J. Dolan (I&M), Amendment No. 27 to Facility Operating License No. 74, dated February 10, 1981
3. Letter from D. L. Wigginton (NRC) to J. Dolan (I&M), Amendment Nos. 111 and 94 to Facility Operating License Nos. DPR-58 and DPR-74, dated June 10, 1987
4. Letter from J. Stang (NRC) to M. Alexich (I&M), Amendment Nos. 120 and 107 to Facility Operating License Nos. DPR-58 and DPR-74, dated February 9, 1989
5. Letter from T. G. Colburn (NRC) to M. P. Alexich (I&M), "Amendment Nos. 148 and 134 to Facility Operating License Nos. DPR-58 and DPR-74: (TAC Nos. 75395, 75396 and 76816)," dated August 27, 1990
6. Letter from R. P. Powers (I&M) to U. S. Nuclear Regulatory Commission, "Donald C. Cook Nuclear Plant Units 1 and 2; Technical Specification Change Request; Pressurizer Heaters," Correspondence Number C0900-12 dated September 1, 2000

ATTACHMENT 2 TO C0900-09

NO SIGNIFICANT HAZARDS CONSIDERATION EVALUATION

Indiana Michigan Power Company (I&M), the Licensee for Donald C. Cook Nuclear Plant (CNP) Unit 2, has evaluated this proposed amendment and determined that it does not involve a significant hazard. According to 10 CFR 50.92(c), a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

1. involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated;

2. create the possibility of a new or different kind of accident from any previously analyzed; or

3. involve a significant reduction in a margin of safety.

I&M has incorporated analytical changes regarding operation of the pressurizer heaters and spray effectiveness as they relate to certain transient events analyzed for pressurizer overfill. Because of these changes, I&M proposes to revise the initial value of the moderator temperature coefficient (MTC) that is assumed in the Unit 2 analyses for these events.

The changes in the Unit 1 and Unit 2 analyses are for the loss of all non-emergency alternating current power (LOAC) and loss of normal feedwater (LONF) transients. To model these transients more accurately, changes have been made or are being requested to incorporate assumptions in the LOAC and LONF pressurizer overfill analyses. Specifically, I&M revised these analyses to: 1) model the pressurizer heaters; and 2) increase effectiveness of the pressurizer spray at higher pressurizer water levels. For Unit 2 only, the assumed MTC is proposed to be changed from the currently assumed value of +5 percent millirho per degree Fahrenheit (pcm/°F) to 0 pcm/°F. Because this change in MTC is non-conservative relative to the value assumed in safety analyses credited in previous Nuclear Regulatory Commission (NRC) safety evaluation reports, this analytical assumption change was determined to involve an unreviewed safety question. Therefore, NRC staff review and approval of the revised MTC input assumption is required in accordance with 10 CFR 50.90.

I&M has revised the Unit 1 and Unit 2 LOAC and LONF analyses to model the effects of pressurizer heaters on pressurizer water level. This change provides consistency with CNP analysis methodology by including an input assumption regarding pressurizer heater operation that will yield more conservative analytical results. Westinghouse Electric Company (Westinghouse), in Nuclear Safety Advisory Letter (NSAL) 98-007 (Reference 1), identified the need to incorporate this modeling assumption. NSAL-98-007 identified that when the heaters are modeled in the analyses of pressurizer fill events, they could make the transient results more limiting by increasing the rate at which the pressurizer fills. The increased pressurizer fill rate

could result in an earlier predicted occurrence of the maximum pressurizer level during the transient, which could result in a water-solid pressurizer condition (i.e., pressurizer overfill).

I&M has also revised the Unit 1 and Unit 2 LOAC and LONF analyses to incorporate a change to the modeling of pressurizer spray for analysis of these transients. This change corrects a potential non-conservative modeling assumption with respect to the effectiveness of the spray at pressurizer water levels approaching a water-solid pressurizer condition (i.e., > 90% volume). The need to change this modeling assumption was also identified in NSAL-98-007.

Finally, I&M proposes to change the MTC value assumed in the Unit 2 LOAC and LONF analyses from the currently assumed partial-power value of +5 pcm/°F to the full-power value of 0 pcm/°F. This input assumption change is requested to achieve acceptable results for the pressurizer fill analysis for these two transients when analyzed for Unit 2.

The determination that the criteria set forth in 10 CFR 50.92 are met for this amendment request is indicated below.

1. Does the change involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated?

The proposed change (i.e., revise MTC assumption) and changes already implemented (i.e., revised modeling of pressurizer heaters and sprays) result in more conservative modeling of transient analyses and do not involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated. The proposed change and changes already implemented would affect the analyzed reactor coolant system (RCS) response to a LOAC or LONF transient. Operational occurrences that are postulated to occur on a moderate frequency, such as the LOAC and LONF transients, are analyzed to ensure they do not generate a more serious plant condition without other faults occurring independently. Specifically, these events are analyzed to ensure that pressurizer overfill would not occur. If pressurizer overfill occurs, liquid could pass through the power-operated relief valves or the safety valves. Since these valves are qualified to pass steam and not liquid, there is a potential to fail one of these valves in the open position, creating an uncontrolled release of primary coolant. An uncontrolled release of primary coolant through a failed-open relief or safety valve would be considered a small break loss-of-coolant accident (SBLOCA). Because a loss-of-coolant accident is a more serious condition than a LOAC or LONF transient, this would constitute a violation of the acceptance criterion discussed above. The changes already implemented affect the approach to modeling the pressurizer heaters and sprays in the accident analysis and the proposed Unit 2 MTC change affects an input assumption to the analyses, but none of these changes result in a revision to the acceptance criteria for a change in the probability of occurrence of these events.

The changes to the pressurizer heater and spray modeling assumptions result in a more conservative outcome for the LOAC and LONF transients. When considered in concert with the proposed change to reduce the assumed MTC value, the revised LOAC and LONF analyses yield acceptable results (pressurizer overfill does not occur). Pressurizer heaters and sprays are control systems that are used to modulate the primary coolant pressure during normal operation, and during certain postulated accident scenarios. Neither of these control systems are considered precursors or initiators to any accidents described in the Updated Final Safety Analysis Report (UFSAR). The change to conservatively assume the heaters are in operation during a LOAC or LONF transient does not affect the actual design or operation of the heaters during any mode of operation. Similarly, revising the assumed effectiveness of the sprays in the LOAC and LONF accident analyses has no effect on the actual design or operation of the sprays. Consequently, the changes to the assumed operation of the sprays and heaters in the LOAC and LONF accident analyses would not cause either of these control systems to become an initiator or precursor of an accident. The MTC is an analysis input that affects the way the plant responds during a temperature transient. Reducing the MTC assumed in the analysis to a more restrictive value will result in a less severe response of the reactor core and RCS to the LOAC and LONF transients. The MTC assumed for a safety analysis does not initiate any accident scenarios. Changing the MTC as an assumed input to the analysis does not result in an increase in the frequency of any initiating events. Therefore, these changes do not increase the probability of a previously evaluated accident.

The operation of pressurizer heaters and sprays has no direct impact on radiological consequences of a LOAC, LONF, or any other previously analyzed event. Similarly, the assumed MTC does not directly impact the source term or radiological release pathways for any previously analyzed events. Revising the LOAC and LONF analyses to conservatively model the pressurizer heaters and sprays and to assume a more restrictive MTC value results in precluding the occurrence of a pressurizer overfill condition. Consequently, the revised LOAC and LONF analyses demonstrate that these transients would not progress to the occurrence of a SBLOCA. Therefore, these analytical changes do not result in an increase in the consequences for these transients.

Therefore, the probability of occurrence or the consequences of accidents previously evaluated are not significantly increased.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The changes in modeling and assumptions for the LOAC and LONF transients do not create the possibility of a new or different kind of accident from any accident previously evaluated. The changes to the modeling of the pressurizer heaters and sprays are analysis assumption changes that result in a more conservative outcome for the LOAC and LONF transients. Because the

changes do not alter the design or operation of the pressurizer heaters or sprays, they do not introduce any new malfunctions. The changes pertain to the correction of analysis assumptions for modeling the pressurizer control features for the two UFSAR events that have been evaluated. The only potential outcome of the application of the heater and revised spray models causing the analyses to exceed the acceptance criteria is another event (i.e., SBLOCA) that has been evaluated in the UFSAR. Consequently, the changes to the modeling of pressurizer heaters and sprays in the LOAC and LONF transients cannot affect or create new accident initiators or precursors or create the possibility of a new or different kind of accident.

The MTC is an analysis input that affects the way a plant responds during a temperature transient. Reducing the MTC assumed in the analysis to a more restrictive value will result in a less severe response of the reactor core and RCS to the LOAC and LONF transients. As used in these analyses, the assumed MTC value is not a factor in initiating any accident scenarios. Consequently, the application of a lower MTC value to the analyses of the LOAC and LONF transients cannot affect or create new accident initiators or precursors or create the possibility of a new or different kind of accident.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the change involve a significant reduction in a margin of safety?

The changes to modeling and assumptions for the LOAC and LONF transients do not involve a significant reduction in a margin of safety. The changes to the modeling of the pressurizer heaters and sprays result in a more conservative outcome for the LOAC and LONF transients. The acceptance criterion for events analyzed for pressurizer overfill, such as the LOAC and LONF transients, is that the pressurizer does not reach a water-solid condition. In order for the Unit 2 analyses to meet this acceptance criterion, it was necessary to change the assumed MTC from a positive value to zero at full-power conditions. However, a positive MTC has been assumed in previous NRC analyses of these transients in support of past CNP license amendments. Specifically, the NRC's approval of the current Unit 2 Technical Specification (T/S) 3/4.1.1.4 MTC curve (License Amendment 107 to DPR-74) was predicated, in part, on the basis that the safety analysis assumptions remain valid. Because a positive MTC was assumed in previous safety analyses, and the proposed MTC value is less conservative than the positive value assumed in those previous safety analyses, this activity is a reduction in the margin of safety.

T/S 3/4.1.1.4, Figure 3.1-2, specifies the operational limits for the MTC. The T/S allows a constant MTC of +5 pcm/°F for core power levels from 0% to 70%. Above 70% power, the allowed MTC value ramps down linearly to 0 pcm/°F at full power. The basis for the limitations

on MTC are provided to ensure that the value of this coefficient remains within the limiting conditions assumed in the UFSAR accident and transient analyses. Although the revised initial MTC value assumed in these analyses is reduced from that assumed in the current analyses of record in the CNP UFSAR, it is still within the requirements of Unit 2 T/S 3.1.1.4 for 100% power. Thus, the revised MTC value remains bounding for full-power operation. Furthermore, the analyses for the LONF and LOAC scenarios both assume an initial reactor power of 102%, which also bounds full power operation. Consequently, the revised assumption for the Unit 2 MTC ensures that the conditions assumed for the transient evaluation still bound the most limiting plant operating conditions and are consistent with the requirements in T/S 3.1.1.4. Thus, the basis for approval of the current Unit 2 MTC curve, as specified by the safety evaluation report that approved this curve (Amendment No. 107 to DPR-74), remains valid.

A sensitivity study was performed to confirm that the basis for establishing an MTC of 0 pcm/°F at full power bounds partial-power conditions with the corresponding positive MTC. Specific LOAC and LONF calculations were performed by varying (reducing) the nominal core power levels and assuming the corresponding positive MTC values at each core power level. The result of the study confirmed that, for both the LOAC and LONF events, the full power case with an MTC value of 0 pcm/°F bounds the case with a positive MTC initialized at a lower power level.

By revising the assumed MTC value from a positive value to zero, the Unit 2 LOAC and LONF analyses demonstrate that the analysis acceptance criteria are met (i.e., pressurizer overfill does not occur) and bound the positive MTC cases at lower power levels. Therefore, the combination of these three analytical modeling changes results in an acceptable analytical outcome for Unit 2. Furthermore, the zero MTC value is still within the requirements of Unit 2 T/S 3.1.1.4 for 100% power. Thus, the revised MTC value remains bounding for full-power operation. Although the proposed MTC assumed in the LOAC and LONF analyses is a reduction in the margin provided to the NRC in previous evaluations of these transients, the use of the full-power MTC is consistent with the plant T/S and is bounding for full-power operation and partial-power operation at the corresponding MTC value allowed by the plant T/S.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

In summary, based upon the above evaluation, I&M has concluded that the proposed change involves no significant hazards consideration.

ATTACHMENT 3 TO C0900-09

ENVIRONMENTAL ASSESSMENT

Indiana Michigan Power Company (I&M) has evaluated this license amendment request against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. I&M has determined that this license amendment request meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9). This determination is based on the fact that this change is being proposed as an amendment to a license issued pursuant to 10 CFR Part 50 that changes a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or that changes an inspection or a surveillance requirement, and the amendment meets the following specific criteria.

(i) The amendment involves no significant hazards consideration.

As demonstrated in Attachment 2, this proposed amendment does not involve significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.

As documented in Attachment 1, there will be no significant change in the types or significant increase in the amounts of any effluents released offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed changes will not result in significant changes in the operation or configuration of the facility. There will be no change in the level of controls or methodology used for processing of radioactive effluents or handling of solid radioactive waste, nor will the proposal result in any change in the normal radiation levels within the plant. Therefore, there will be no significant increase in individual or cumulative occupational radiation exposure resulting from this change.