



March 11, 2003

AEP:NRC:2016-05

Docket No: 50-316

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Stop O-P1-17  
Washington, DC 20555-0001

Donald C. Cook Nuclear Plant Unit 2  
REQUEST FOR NOTICE OF ENFORCEMENT DISCRETION  
FROM TECHNICAL SPECIFICATION 3.7.1.2  
LIMITING CONDITION FOR OPERATION FOR THE  
AUXILIARY FEEDWATER SYSTEM

Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 2 (DPR-74), requests regional enforcement discretion from compliance with the requirements of Technical Specification (TS) 3.7.1.2, Action "a." I&M requests that the 72-hour allowed outage time (AOT) included in TS 3.7.1.2, Action "a," be extended by an additional 36 hours to accomplish restoration of the Unit 2 West Motor Driven Auxiliary Feedwater (MDAFW) pump to an operable status.

On March 5, 2003, the Unit 2 West MDAFW pump was declared inoperable and the 72-hour AOT for TS 3.7.1.2, Action "a," was entered in preparation for routine maintenance. During post-maintenance testing of the pump, a loud "buzzing" noise was heard emanating from the vicinity of the pump motor. The conservative decision was made to replace the suspect motor with a spare motor of larger dimension, but functionally equivalent. CNP has determined that the time necessary to install the spare motor, test, and return the West MDAFW pump to an operable status would exceed the 72-hour AOT per TS 3.7.1.2, Action "a."

CNP evaluated the above described condition and determined that the risk of the requested extension does not warrant an unnecessary plant transient to shut down Unit 2. Requesting a license amendment would not be practical because the Unit 2 West MDAFW pump would be restored to compliance with the TS before a license amendment could be issued.

A-001

Therefore, I&M requested enforcement discretion to preclude a required entry for Unit 2 into Mode 3 by 1000 hours on March 8, 2003. To accomplish this, I&M requested the 72-hour AOT for Unit 2 TS 3.7.1.2, Action "a," be extended by 36 hours.

The details contained in the attachment to this letter were discussed with the Nuclear Regulatory Commission (NRC) staff in a conference call beginning at 2300 hours on March 7, 2003. Regional enforcement discretion was verbally granted at 0127 hours on March 8, 2003.

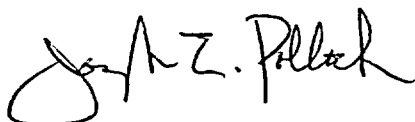
On March 9, 2003, the Unit 2 West MDAFW pump was declared operable at 0246 hours. At that time, Unit 2 exited the action statement for TS 3.7.1.2.

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.

This submittal contains no new commitments.

Should you have any questions, please contact Mr. Brian A. McIntyre, Manager of Regulatory Affairs, at (269) 697-5806.

Sincerely,



Joseph E. Pollock  
Site Vice President

BWO/jen

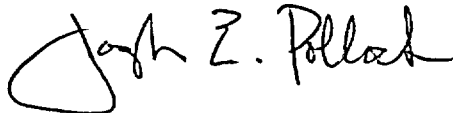
Attachment

c: K. D. Curry – AEP Ft. Wayne  
J. E. Dyer – NRC Region III  
J. T. King – MPSC  
MDEQ - DW & RPD  
NRC Resident Inspector  
J. F. Stang, Jr. – NRC Washington DC

**AFFIRMATION**

I, Joseph E. Pollock, 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.

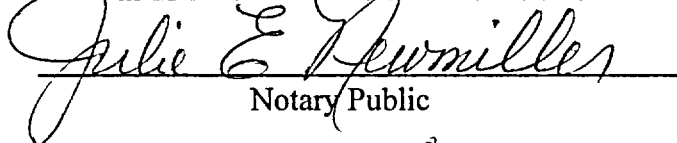
Indiana Michigan Power Company



Joseph E. Pollock  
Site Vice President

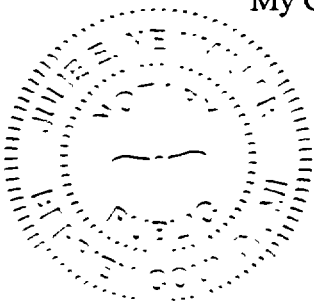
SWORN TO AND SUBSCRIBED BEFORE ME

THIS 11<sup>th</sup> DAY OF March, 2003

  
Notary Public

My Commission Expires 8-22-2004

JULIE E. NEWMILLER  
Notary Public, Berrien County, MI  
My Commission Expires Aug 22, 2004



bc: A. C. Bakken III  
P. B. Cowan  
M. J. Finissi  
J. P. Gebbie  
S. A. Greenlee  
D. W. Jenkins  
J. A. Kobyra, w/o attachment  
E. A. Larson, w/o attachment  
B. A. McIntyre, w/o attachment  
J. E. Newmiller  
D. J. Poupard  
M. K. Scarpello, w/o attachment  
T. K. Woods, w/o attachment

ATTACHMENT TO AEP:NRC:2016-05

WRITTEN REQUEST FOR A NOTICE OF ENFORCEMENT DISCRETION

**1. TECHNICAL SPECIFICATION REQUIREMENT OR OTHER LICENSE CONDITIONS THAT WILL BE VIOLATED**

Action "a" of Technical Specification (TS) 3.7.1.2, "Auxiliary Feedwater System," will be violated for Unit 2.

The TS 3.7.1.2 Limiting Condition for Operation (LCO) requires that, in Modes 1 through 3 (power operation through hot standby), three independent Auxiliary Feedwater (AFW) pumps be operable. If one AFW pump is inoperable, Action "a" of TS 3.7.1.2 requires that the AFW pump be restored to operable status within 72 hours or be in at least HOT STANDBY (Mode 3) within the next 6 hours and in HOT SHUTDOWN (Mode 4) within the following 6 hours.

Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP), requests regional enforcement discretion from compliance with TS 3.7.1.2, Action "a," for Unit 2 such that the 72-hour allowed outage time (AOT) will be extended by 36 hours to restore the Unit 2 West Motor Driven AFW (MDAFW) pump to an operable status.

**2. CIRCUMSTANCES SURROUNDING THE SITUATION, INCLUDING APPARENT ROOT CAUSES, THE NEED FOR PROMPT ACTION AND IDENTIFICATION OF RELEVANT HISTORICAL EVENTS**

At 0400 hours on March 5, 2003, TS LCO 3.7.1.2, Action "a" was entered to perform routine maintenance on the Unit 2 West MDAFW pump. During post-maintenance surveillance testing of the pump, a loud "buzzing" noise (lasting approximately one second) was heard emanating from the vicinity of the pump motor. Due to the presence of the noise, infrared thermography of the motor was performed during the surveillance. No abnormalities were indicated.

The motor was instrumented for another run to collect data to assist in determining the source and cause of the noise. The motor was started and the following data was collected during the five-minute run:

- Electromagnetic Interference (EMI) testing utilizing the hand-held EMI unit. The data did not indicate the presence of a degraded condition.
- Vibration monitoring of the motor. The data did not indicate the presence of a degraded condition or a degrading trend.
- Oil samples were collected from the motor and pump bearings. Visual examination indicated no problems in the oil, nor any evidence of bearing degradation.

Following the five-minute run, the circuit breaker was checked and preventive maintenance was performed that ruled out the circuit breaker as the cause for the noise.

In addition, a motor characterization test was performed. This test checks the condition of the insulation in the motor and power cables from the circuit breaker. It also checks the electrical connections and the inductance of the motor stator windings. The test results indicated no abnormalities or evidence of degradation.

The condition monitoring tests that were performed prior to and following the manifestation of the noise did not indicate any degraded condition. However, based on the prior experience of the personnel involved, the noise was believed to indicate a potentially degraded condition in the motor. As such, the following actions were performed:

- The pump and motor were rotated by hand and both were found to rotate freely.
- The pump was uncoupled from the motor and each component was rotated by hand. Both were found to rotate freely.
- The motor was run uncoupled and a similar noise was heard.

At this point, CNP decided to replace the suspect West MDAFW pump motor with a spare. This decision was based on the results of a supporting/refuting evaluation performed by CNP, which eliminated the pump, breaker, or system alignment as the possible source of the noise. The spare pump motor was functionally the same, but had a different frame size. However, the spare motor was identical to the frame size used on the Unit 1 and Unit 2 East MDAFW pumps. Because the spare was of a different frame size, changes to the motor mounting configuration were necessary. A different coupling hub was required for the spare motor, which has a larger shaft size than the suspect motor it was replacing. In addition, the spare motor weighs more than the suspect motor (4,800 pounds versus 2,800 pounds).

An equivalency evaluation was performed to evaluate the differences between the suspect motor and the spare motor. All critical characteristics were compared to the current motor design. CNP concluded that the differences had no adverse effect on the function or qualification of the West MDAFW pump.

A search of CNP's corrective action system database did not identify similar occurrences with other AFW pump motors or any other motors. In addition, plant personnel were interviewed to obtain earlier history. Other significant large motor failures had occurred at CNP (e.g., reactor coolant pump, non-essential service water and condensate booster pump motors), but the motors are of differing voltages and differing manufacturers than the West MDAFW pump motor.

Searches in the INPO EPIX database did not reveal a similar condition with Reliance Electric motors (the manufacturer of CNP's MDAFW pump motors). Documented failures were related to bearing failures or breaker/relay issues.

The apparent cause of the Unit 2 West MDAFW pump motor noise was a loose rotor or stator bar. This conclusion is consistent with the EPRI Technical Report for Troubleshooting of Electric Motors. The suspect motor will be sent offsite to a qualified vendor for as-found condition analysis.

At the time that enforcement discretion was requested, the spare motor had been installed and an uncoupled run was successfully performed. Remaining work was to fabricate the motor coupling, align the spare motor to the West MDAFW pump, couple, and successfully perform post-maintenance testing before restoring the pump to an operable status.

**3. SAFETY BASIS FOR THE REQUEST, INCLUDING AN EVALUATION OF THE SAFETY SIGNIFICANCE AND POTENTIAL CONSEQUENCES OF THE PROPOSED COURSE OF ACTION, INCLUDING A QUALITATIVE RISK ASSESSMENT USING BOTH RISK INSIGHTS AND INFORMED JUDGEMENTS**

The AFW system is a safety-related system that provides feedwater to the steam generators (SGs) when the main feedwater pumps are unavailable. Each unit's AFW system consists of three feedwater supply trains with diverse power sources. One train includes a turbine-driven AFW pump supplying all four SGs. The other two trains consist of MDAFW pumps, each supplying two SGs. The MDAFW pumps are capable of supplying the corresponding sets of SGs in the opposite unit through manual cross-tie supply valves.

Safety Basis/Risk Impact:

This Notice of Enforcement Discretion (NOED) has been evaluated from a probabilistic risk perspective. This evaluation determined that the risk associated with maintaining the plant at power for an additional 36 hours with the Unit 2 West MDAFW pump inoperable is lower than the risk associated with performing a reactor shutdown.

An evaluation was performed using WinNUPRA to quantify the updated 2001 version of the CNP probabilistic risk assessment (PRA) model. For the evaluation, two zero test and maintenance quantifications of the PRA model were performed: one quantification run assumed all equipment was available (as a base case) and the other case assumed the Unit 2 West MDAFW pump was unavailable. No other equipment that would have an effect on Unit 2 risk was assumed unavailable since no equipment is currently out of service.

A comparison of the results from these two quantifications of the PRA model indicate an increase in the core damage frequency (CDF) of  $5.7E-8$  per day, and an increase in large early release frequency (LERF) of  $9.4E-9$  per day over the zero-maintenance base case model results (CDF and LERF for the base case are  $3.85E-5$  per year and  $4.77E-6$  per year, respectively).

These increases in CDF and LERF were also compared to the risk associated with a reactor trip that could occur during a controlled shutdown. This risk was characterized by the conditional core damage probability (CCDP) and conditional large early release probability (CLERP) for such an occurrence. The averted CCDP (CLERP) value was determined as the product of the CCDP (CLERP) for a reactor trip initiating event and the probability that such a trip might occur during a power descension.

The CCDP/CLERP associated with a reactor trip that could occur during a controlled shutdown was calculated as follows:

- The CDF from transients with power conversion available was divided by the transient event frequency.
- The LERF from transients with power conversion available was divided by the transient event frequency.
- These probabilities were then multiplied by the conditional probability of a reactor trip occurring during a controlled shutdown.

The probability of a reactor trip during a controlled shutdown was estimated based on CNP-specific data from 1990 through 2002. The resulting CCDP and CLERP values are  $3.2E-07$  and  $2.2E-08$ , respectively.

A review of these results indicates that LERF is the limiting risk factor. Dividing the CLERP for the shutdown cycle by the daily LERF increase for remaining at power with the Unit 2 West MDAFW pump out-of-service shows that there is no net increase in risk associated with maintaining Unit 2 at power for an additional 2.3 days (or approximately 56 hours). Based on the analysis above, there is no net increase in risk associated with extending the AOT of the Unit 2 West MDAFW pump from 72 hours to a total of 108 hours.

#### **4. THE JUSTIFICATION FOR THE DURATION OF THE NONCOMPLIANCE**

I&M proposed to extend the 72-hour AOT to a total of 108 hours to allow sufficient time to install the spare Unit 2 West MDAFW pump motor, machine (approximately 4 to 6 hours) the motor coupling, install (approximately 4 to 12 hours) and align (approximately 8 to 12 hours) the motor coupling, and perform post-maintenance (approximately 2 to 4 hours) and operability (approximately 1 to 2 hours) testing before the pump could be restored to an operable status. As



discussed above, there is no net increase in risk associated with operating Unit 2 for an additional 36 hours.

With enforcement discretion granted at 0127 hours on March 8, 2003, Unit 2 avoided the unnecessary transient of a reactor shutdown.

**5. BASIS FOR THE CONCLUSION THAT THE NONCOMPLIANCE WILL NOT BE OF POTENTIAL DETRIMENT TO THE PUBLIC HEALTH AND SAFETY AND THAT NO SIGNIFICANT HAZARD CONSIDERATION IS INVOLVED**

I&M has evaluated this request for enforcement discretion against the criteria set forth in 10 CFR 50.92 and concludes that the request involves no significant hazards consideration. The evaluation is provided below.

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

Extending the 72-hour AOT by 36 hours does not physically alter any plant structures, systems, or components, and does not affect or create new accident initiators or precursors. The allowed outage time for a component is not an accident initiator; therefore, there is no effect on the probability of accidents previously evaluated.

The AFW system is required to mitigate the consequences of accidents previously evaluated in the Updated Final Safety Analysis Report. Extending the 72-hour AOT by an additional 36 hours does not significantly increase the consequences of an accident since the redundant Unit 2 East MDAFW pump and turbine-driven AFW (TDAFW) pump remain operable and capable of performing their design function. In addition, the probability of an accident occurring during the 36-hour extension is low. The requested action does not affect the types or amounts of radionuclides released following an accident, or the initiation and duration of their release.

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 requested action to extend the 72-hour AOT by 36 hours does not physically alter any structures, systems, or components, and does not affect or create new accident initiators or precursors. The accident analysis assumptions and results are unchanged. No new failures or interactions have been created.

Extending the 72-hour AOT by an additional 36 hours does not introduce new failure modes or mechanisms associated with plant operation. Furthermore, the additional 36-hour period associated with the restoration of the Unit 2 West MDAFW pump would not create a new accident type.

Therefore, the 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 applicable margin of safety is the period of time that the Unit 2 West MDAFW pump is inoperable. I&M has determined that no net increase in risk is associated with extending the 72-hour AOT by an additional 36 hours. Although the proposed action deviates from a requirement in TS 3.7.1.2, it does not affect any safety limits, setpoints in the TS, or other operational parameters, nor does it affect any margins assumed in the accident analyses. The redundant Unit 2 East MDAFW pump and TDAFW pump continue to be operable to perform their required design function.

Therefore, the proposed action does not significantly reduce the margin of safety.

6. **THE BASIS FOR THE CONCLUSION THAT THE NONCOMPLIANCE WILL NOT INVOLVE ADVERSE CONSEQUENCES TO THE ENVIRONMENT**

I&M has evaluated the requested enforcement discretion 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 the requested action meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9). This determination is based on the fact that the proposed action is being requested as enforcement discretion to a license issued pursuant to 10 CFR 50, and that the change involves no significant hazards considerations. Although the proposed action involves noncompliance with the requirements of an LCO:

- (i) The proposed action involves no significant hazards consideration.
- (ii) There is no significant change in the types or a significant increase in the amounts of any effluent that may be released offsite, since the proposed action does not affect the generation of any radioactive effluent nor does it affect any of the permitted release paths.
- (iii) There is no significant increase in individual or cumulative occupational radiation exposure. The action proposed in this request for enforcement discretion will not significantly affect plant radiation levels, and, therefore, does not significantly affect dose rates and occupational exposure.

Accordingly, the proposed action meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

## **7. PROPOSED COMPENSATORY MEASURES**

During the period that the Unit 2 West MDAFW pump was inoperable, the following compensatory measures and restrictions were in effect:

- No Unit 2 safety-related equipment was to be removed from service for maintenance.
- No Unit 2 vital secondary equipment was to be removed from service for maintenance.
- No work was to be performed on shared safety significant systems (i.e., essential service water, charging, and AFW).
- No work was to be performed which could have potentially jeopardized unit operation (i.e., waterbox flushing, pump swaps, etc.).
- No switchyard work was to be performed.
- The system dispatcher was contacted to confirm that in the event system degradation or perturbations were to occur, the control room would be notified.

In addition, during the period that the Unit 2 West MDAFW pump was inoperable, any forecast of severe weather was to be evaluated by the Shift Manager for potential impact on offsite power sources. If such an impact had been identified, then with concurrence of the Director of Operations or Assistant Director of Operations, the NRC Senior Resident Inspector was to be notified, and Unit 2 would have been shut down in an orderly manner.

## **8. STATEMENT THAT THE REQUEST HAS BEEN APPROVED BY THE FACILITY ORGANIZATION THAT NORMALLY REVIEWS SAFETY ISSUES**

This request was reviewed and approved by the Plant Operations Review Committee.

## **9. CRITERIA FOR APPROPRIATE PLANT CONDITIONS SPECIFIED IN NRC INSPECTION MANUAL CHAPTER 9900 SECTION B**

I&M evaluated the requested enforcement discretion against the criteria specified in Section B.2.1.1.a of NRC Inspection Manual Chapter 9900. This section states that the NOED is intended to avoid unnecessary transients as a result of compliance with the license condition and thus minimize potential safety consequences and operational risks.

I&M considered that the condition satisfied this criterion. Compliance with TS 3.7.1.2, Action "a," could have initiated an undesirable transient by requiring Unit 2 to be in Mode 3 by 1000 hours on March 8, 2003. Extending the allowed outage time from 72 hours to 108 hours

allowed continued Unit 2 operation for that additional time needed to perform the required Unit 2 West MDAFW pump motor replacement and subsequent testing of the pump. No corresponding health and safety benefit was gained by requiring a plant shutdown. Based on the above, the criteria were satisfied.

**10. FOLLOWUP LICENSE AMENDMENT**

No TS changes are required.

**11. CIRCUMSTANCES INVOLVING SEVERE WEATHER OR OTHER NATURAL EVENTS**

The proposed enforcement discretion did not involve severe weather or other natural events.