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 FACIL:50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana & 05000316
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 RECIP.NAME RECIPIENT AFFILIATION
 DAVIS,A.B. Document Control Branch (Document Control Desk)

SUBJECT: Responds to 900226 ltr transmitting notice of violation &
 proposed imposition of civil penalty in amount of \$75,000.

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AEP:NRG:1125
10 CFR 2.201

Donald C. Cook Nuclear Plant Unit 2
Docket No. 50-316
License No. DPR-74
NRC INSPECTION REPORT NO. 50-316/89028 (DRP); RESPONSE
TO NOTICE OF VIOLATION

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Attn: A. B. Davis

March 27, 1990

Dear Mr. Davis:

This letter is in response to your letter dated February 26, 1990, which forwarded a Notice of Violation and proposed imposition of a civil penalty in the amount of \$75,000. The Notice of Violation and associated civil penalty resulted from a routine safety inspection conducted at the Cook Nuclear Plant on October 16 through 20, October 24 through 26, and December 4, 1989, by members of your staff. The violation involves the installation of an improperly sized flow orifice in the Cook Nuclear Plant Unit 2 turbine-driven auxiliary feedwater pump (TDAFP) discharge prior to initial plant startup. The mis-sized orifice resulted in the establishment of an incorrect setpoint in the TDAFP flow retention circuitry which created the potential for TDAFP runout and subsequent unavailability of this source of auxiliary feedwater following a postulated feedwater or main steam line break.

Our response to the Notice of Violation is provided in the attachment to this letter. In addition, item 4 of the attachment responds to your request that we specifically address actions taken to improve our corrective action system and operator attention to detail during the conduct of testing. In response to your further request, item 4 of the attachment also provides a discussion of our evaluation of our receipt inspection program in an effort to identify areas in need of improvement. The \$75,000 civil penalty is being remitted through a separate submittal.

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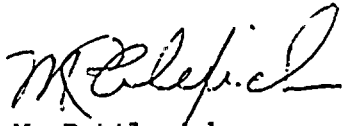
Mr. A. B. Davis

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AEP:NRC:1125

This letter is submitted pursuant to 10 CFR 50.54(f) and, as such, an oath is enclosed.

Sincerely,



M. P. Alexich
Vice President

ldp

Attachment

cc: D. H. Williams, Jr.
A. A. Blind - Bridgman
R. C. Callen
G. Charnoff
A. B. Davis - Region III
NRC Resident Inspector - Bridgman
NFEM Section Chief

STATE OF OHIO)
COUNTY OF FRANKLIN)

Milton P. Alexich, being duly sworn, deposes and say that he is the Vice President of licensee Indiana Michigan Power Company, that he has read the foregoing Response to NRC Inspection Report No. 50-316/89028 (DRP); Response to Notice of Violation and knows the contents thereof; and that said contents are true to the best of his knowledge and belief.

M. Alexich

Subscribed and sworn to before me this 27th

day of March, 1990.

Rita D. Hill
NOTARY PUBLIC

— RITA D. HILL
— NOTARY PUBLIC, STATE OF OHIO
— MY COMMISSION EXPIRES 6-28-94

ATTACHMENT TO AEP:NRC:1125

RESPONSE TO VIOLATION

NRC Violation

"Technical Specification 3.7.1.2 requires at least three independent steam generator auxiliary feedwater pumps and associated flow paths be operable in Modes 1, 2 and 3. With one auxiliary feedwater pump inoperable, restore that pump to operable status within 72 hours or be in hot standby within the next 6 hours and hot shutdown within the following 6 hours.

Contrary to the above, while the facility has been in Modes 1, 2 and 3, the licensee did not have three independent steam generator auxiliary feedwater pumps and associated flow paths operable during the period from August 31, 1978 through November 10, 1989, and action was not taken to restore all pumps to operable status or place the facility in hot standby or hot shutdown. The Turbine-Driven Auxiliary Feedwater Pump (TDAFP) was inoperable during this period due to the inability of the flow retention system for the TDAFP to prevent run out of the TDAFP and its resulting failure in the event of a feedwater or steam line break.

This is a Severity Level III violation (Supplement I).
Civil Penalty - \$75,000."

Response to Violation

On October 19, 1989, an NRC inspector witnessing inservice testing of the Unit 1 turbine-driven auxiliary feedwater pump (TDAFP) observed that the pump flow as indicated by the permanently mounted process flowmeter was significantly lower than that indicated by the portable instrument connected to the test line orifice used for the inservice test. The process flow meter was reading approximately 150 gpm less than the 700 gpm indicated by the test flow meter at the Technical Specification test point. Subsequent review by Cook Nuclear Plant personnel found that the portable test meter reading was accurate.

On the basis of orifice differential pressure versus flow calculations, we determined that the discrepancy in the process flow indication resulted in the TDAFP flow retention circuitry setpoint being at approximately 1225 gpm versus the required 975 gpm. The 1225 gpm setpoint was too high to prevent pump runout and hence created the potential for loss of the TDAFP following a feedwater or main steam line break. Although the TDAFP may potentially have been unavailable for these accident conditions, we conclude that no significant adverse implications with regard to protection of public health and safety would have resulted. As a backup to the TDAFP, two motor-driven auxiliary feedwater pumps (MDAFP), each feeding two steam generators, are available as a source of auxiliary feedwater. As a further backup source of auxiliary feedwater, cross-ties installed at the Cook Nuclear Plant allow one unit's

MDAFPs to provide auxiliary feedwater to the opposite unit. In reaching our conclusion that public health and safety would not have been adversely impacted as a result of the situation cited in the Notice of Violation, we reviewed the UFSAR analyses of a postulated feedwater line or steam line break with the TDAFP unavailable. In the case of a steam line break, this is a cooldown accident in which the concern is a return of the core to power from a subcritical condition due to a negative moderator temperature coefficient. The potential for a return to power is aggravated by higher auxiliary feedwater flow rates. As a result, the UFSAR analysis assumes that the TDAFP goes to runout during the steam line break. Therefore, the UFSAR analysis results for this accident are not adversely affected by the condition. With regard to a postulated feedwater line break, this would initially be a cooldown accident followed by an eventual heatup of the primary system due to the lack of feedwater caused by the break. The UFSAR analysis of this event conservatively neglects the initial cooldown in order to maximize the heatup effects. The accident analysis takes no credit for any auxiliary feedwater flow for the first ten minutes of the accident and then assumes delivery of only 600 gpm to the three intact steam generators following isolation of the faulted steam generator by the operators. This flow is well within the capability of the two MDAFPs, each of which is rated at approximately 450 gpm. In addition, we have performed an analysis of the postulated feedwater line break that demonstrates acceptable results with only one MDAFP providing flow, when credit is taken for actual (vs. Technical Specification allowable) pump performance and steam generator inventory. An independent evaluation performed by the fuel vendor for Unit 2 has confirmed the conclusions of our analyses.

1. Admission or Denial of the Alleged Violation

Indiana Michigan Power admits to the violation as cited in the NRC Notice of Violation. We also accept, without protest, the imposed civil penalty of \$75,000 associated with the cited violation. Payment of the civil penalty will be made through a separate submittal.

2. Reasons for the Violation

The cause of the violation is attributed to inadequacies in the corrective action system that was in place in 1978. Discrepancies in flow readings between the process and test line flow indicators were noticed during preoperational testing for Unit 2. The discrepancy was documented in a Condition Report dated August 31, 1978. Our review of the 1978 Condition Report and subsequent evaluations performed since October 1989 concludes that the flow discrepancy was caused by an improperly sized process flow orifice. As part of the original

investigation conducted in 1978, both the process and test line orifices were pulled and inspected, and the sizes stamped on their identification tabs were verified. No problems were noted during this activity. However, based on a comparison of the flow reading derived from the two orifices in combination with other indications of pump performance it was concluded that the process orifice flow indication was in error. Because of the problem with the orifice, the plant suspended use of the process flow orifice for pump performance testing, using the test line orifice instead. The Condition Report was closed out with a statement that the flow discrepancy would remain under investigation. There was apparently no follow-up action to ensure that proper corrective actions were completed to close-out the Condition Report.

3. Corrective Actions Taken and Results Achieved

Upon discovery of the discrepancy between the flow rates indicated by the test line and process flow orifices, an investigation of the condition was initiated in accordance with our corrective action system. Our investigation showed that the flow indicated by the test line orifice was correct. This in conjunction with TDAFP performance data led to the conclusion that the process flow orifice which provides input to the flow retention circuitry was the source of the observed discrepancy in flow indications. Consequently, on October 25, 1989, the flow retention circuitry setpoints were re-calibrated to compensate for the mis-sized process flow orifice and now provide flow retention at the required TDAFP discharge flow (975 gpm). In addition, the process and test flow indications for the other auxiliary feedwater pumps in both units were compared to ensure that the problem was limited to the Unit 2 TDAFP. This evaluation confirmed that the observed discrepancy between process and test flow indication in the Unit 2 TDAFP does not exist in any of the other auxiliary feedwater pumps.

4. Corrective Action Taken to Avoid Further Violations

As discussed above, our investigation of the condition cited in the Notice of Violation has concluded that the process flow orifice is improperly sized. The original equipment purchase orders required orifice plates to be manufactured to specified dimensions, and be supplied with drawings. After review of receipt inspection documentation it has been concluded that physical dimensions were not verified by actual measurement of the orifice diameter upon receipt of the original order. A replacement order for the Unit 2 TDAFP orifice has been

issued, again specifying dimensions and requiring material certification/certificate of conformance and a certified engineering drawing. Once this material arrives on-site, it will be receipt inspected to the requirements of the current plant procedure which requires a physical layout check of dimensions. The physical layout check includes measurement of the orifice diameter to confirm conformance to dimensional requirements. The receipt inspection procedures currently in effect have been revised since the time the currently installed orifice was delivered. Our review of the current procedures has concluded that they are sufficiently more stringent than those previously in existence to preclude inadequate receipt inspection from being a contributor to a condition of the type addressed in the cited violation.

With regard to operator performance, through the Operations Department review of events documented by the plant's Operating Experience Program, the Operations Department recognizes the importance of operator attention to detail in performing their job. The following are actions taken by Operations Department to promote operator attention to detail:

- a. The Operations Department distributes a "Lessons Learned Report" each four months. This report discusses the personnel errors which occurred during the previous four months. The operator review of this report increases his/her awareness of specific problem areas which require increased attention.
- b. Each five weeks a "Work Practice Reminders" list is sent to the Operations shift personnel attached to the "Shift Requirements" letter. This list reviews items which have been noted as good operator practices. Although, the list does not specifically use the term "attention to detail," the list focuses on items which specifically promote attention to detail.

In addition, to the above efforts by the Operations Department to improve operator attention to detail, further actions have been taken since the recent TDAFP flow retention finding. The actions are as follows:

- a. The plant manager sent a letter to all Cook Nuclear Plant and site contractor personnel. The letter addressed plant personnel responsibilities to identify and document plant deficiencies.

- b. The Operations Superintendent held a meeting with all Operations Department Supervisory personnel. During this meeting, the Operations Superintendent stressed the need for supervisory personnel to stress attention to detail to the personnel who work for them.
- c. The Training Department has prepared a case study of the TDAFP flow retention finding. The case study (RQ-C-1514) is being presented to the Licensed Operators during requal period 1. The case study discusses the need for operators to monitor all available parameters during a test and to follow through on reporting of discrepancies to ensure a satisfactory completion. The case study training will be completed by 3-30-90.

It should also be noted that subsequent to the time at which the cited violation originally occurred, the Cook Nuclear Plant and AEPSC have modified the corrective action system. Specifically, modifications began in November of 1986 when Cook Nuclear Plant and AEPSC combined the Plant's condition reporting system with AEPSC's nonconformance reporting system to create a new problem report system. One of the improvements under the new system was to provide centralized computer tracking for all open corrective/preventive action items. Prior to this time frame these open items were tracked on multiple systems. In addition, deficiencies documented through the revised problem report system are categorized to distinguish significant problems from those of less significance. In this way issues representing potential significant safety impacts receive more immediate attention, and are subject to a more in-depth review, than less significant (e.g., administrative, housekeeping) conditions.

As an additional part of our investigation of this condition, a review of condition reports initiated and closed prior to implementation of our present corrective action system was performed. The purpose of this review was to provide assurance that no other examples exist in which an adverse condition of potential safety significance had been identified and subsequently dispositioned through incomplete or inadequate corrective action. In performing this review, a sample of 100 condition reports (CRs) was chosen at random (using a computer-based random number generator) from a total population of approximately 3800 CRs. Applying the statistical criteria of Information Bulletin 79-02A, the results of our review conclude at the 95% confidence level

that corrective actions taken in closing CRs during the time period prior to implementation of our present corrective action system are adequate to ensure that concerns of potential safety significance have been appropriately resolved.

The new procedures written to implement the problem report system require the documentation of open corrective/preventive action items. For these open action items, due dates are established and responsibility for close out is assigned. These open items are then entered into the centralized computer tracking system. This system is utilized to provide status reports of the open items to both AEPSC and Cook Nuclear Plant management to ensure their timely completion. As a final control, problems which are determined to have a potential significant impact on nuclear safety are reviewed by both the Plant Nuclear Safety Review Committee and the AEPSC Nuclear Safety Design Review Committee. This review specifically checks the disposition of the problem report to ensure appropriate corrective/preventive actions have been completed or listed as open on the problem report. Had this program been in place at the time of Unit 2 pre-operational testing, the violation associated with the TDAFP process flow orifice would likely not have occurred.

5. Date When Full Compliance Will Be Achieved

Full compliance was achieved on October 25, 1989, when the TDAFP process flow indicating switches were reset for proper actuation.