

ACCELERATED DOCUMENT DISTRIBUTION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9303020079 DOC. DATE: 93/02/26 NOTARIZED: YES DOCKET #
 FACIL: 50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana M 05000316
 AUTH. NAME: FITZPATRICK, E. AUTHOR AFFILIATION: Indiana Michigan Power Co. (formerly Indiana & Michigan Ele
 RECIP. NAME: LIEBERMAN RECIPIENT AFFILIATION: Ofc. of Enforcement (Post 870413)

SUBJECT: Responds to NRC 930208 ltr re violations noted in insp rept
 50-316/92-02 on 921203-18. Corrective actions: lube oil
 restored to proper level prior to declaring EDG operable on
 operable on 921005.

DISTRIBUTION CODE: IE14D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 14
 TITLE: Enforcement Action Non-2.790-Licensee Response

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD3-1 LA	1 1	PD3-1 PD	1 1
	DEAN, W	1 1		
INTERNAL:	AEOD/DOA	1 1	AEOD/DSP/TPAB	1 1
	DEDRO	1 1	NRR/DOEA/OEAB11	1 1
	NRR/PMAS/ILRB12	1 1	NUDOCS-ABSTRACT	1 1
	OE DIR	1 1	OE FILE 01	1 1
	<u>REG FIDE</u> 02	1 1	RGN3 FILE 03	1 1
EXTERNAL:	NRC PDR	1 1	NSIC	1 1

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK,
 ROOM P1-37 (EXT. 504-2065) TO ELIMINATE YOUR NAME FROM DISTRIBUTION
 LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 15 ENCL 15

Indiana Michigan
Power Company
P.O. Box 16631
Columbus, OH 43216



AEP:NRC:1175D
10 CFR 2.201

Donald C. Cook Nuclear Plant Unit 2
Docket No. 50-316
License No. DPR-74
NRC INSPECTION REPORT NO. 50-316/92022
REPLY TO NOTICE OF VIOLATION

Director, Office of Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attn: Document Control Desk

February 26, 1993

Dear Mr. Lieberman:

This letter is in response to your letter dated February 8, 1993, which forwarded a Notice of Violation and proposed imposition of a civil penalty in the amount of \$37,500. The Notice of Violation and associated civil penalty resulted from a special safety inspection conducted by J. A. Isom and D. J. Hartland on December 3 through 18, 1992. The violations are associated with the trip of the Unit 2 AB emergency diesel generator on September 28, 1992 due to low lube oil level.

Our reply to the Notice of Violation is provided in the attachment to this letter. The \$37,500 civil penalty will be remitted electronically on March 8, 1993.

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

Sincerely,

E. E. Fitzpatrick
Vice President

dr

Enclosure

Attachment

010161
9303020079 930226
PDR ADDCK 05000316
Q PDR

10/14/11

Mr. J. Lieberman

-2-

AEP:NRC:1175D

cc: A. A. Blind - Bridgman
J. R. Padgett
G. Charnoff
A. B. Davis - Region III
NRC Resident Inspector - Bridgman
NFEM Section Chief

Mr. J. Lieberman

-3-

AEP:NRC:1175D

bc: S. J. Brewer
D. H. Malin/K. J. Toth
M. L. Horvath - Bridgman
J. B. Shinnock
W. G. Smith, Jr.
W. M. Dean, NRC - Washington, D.C.
AEP:NRC:1175D
DC-N-6015.1

STATE OF OHIO)
COUNTY OF FRANKLIN)

E. E. Fitzpatrick, begin duly sworn, deposes and says that he is the Vice President of licensee Indiana Michigan Power Company, that he has read the forgoing response to NRC INSPECTION REPORT NO. 50-316/92022 and knows the contents thereof; and that said contents are true to the best of his knowledge and belief.

E E Fitzpatrick

Subscribed and sworn to me before this 26th
day of February, 19 93.

Rita D. Hill
NOTARY PUBLIC

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

ATTACHMENT TO AEP:NRC:1175D

REPLY TO NOTICE OF VIOLATION

Background

On September 28, 1992, with Unit 2 in Mode 5 (Cold Shutdown), the Unit 2 AB Emergency Diesel Generator (EDG) was started for a routine surveillance test. Twenty four seconds after the start, the EDG tripped due to low lube oil pressure. The lube oil level indicator for the EDG, a simple pressure gauge, indicated that there was 309 gallons in the lube oil tank. A level check of the lube oil tank, via tape measure, indicated 127 gallons. (The minimum lube oil tank level necessary for operability of the Unit 2 AB EDG was later determined to be 212 gallons.) The low level alarm, which operates at a setpoint corresponding to approximately 395 gallons, failed to actuate.

The low lube oil condition was attributable to a leak that had developed in the EDG Before and After (B&A) pump. This pump provides a small (60 gpm) amount of oil flow both during EDG operation and at standby so that the EDG components are constantly lubricated. The leak had been reported on May 9, 1992, during a material condition walkdown. The leak rate at the time of the EDG trip was approximately 3 gallons per day, and is believed to have remained relatively constant from the date of discovery through the date, following the trip event, that the pump was repaired.

NRC Violation I

"Technical Specification 3.8.1.1 requires that two emergency diesel generators (EDGs) be operable for operation in Modes 1 through 4. With one EDG inoperable, the inoperable EDG is required to be restored to an operable status within 72 hours or the unit must be put in at least Hot Standby (Mode 3) within 6 hours and Cold Shutdown (Mode 5) within the following 30 hours.

Contrary to the above, on or about September 10, 1992, AB EDG became inoperable with the unit in Modes 3 and 4, the EDG was not restored to operable status within 72 hours, and the unit was not put in cold shutdown (Mode 5) within the following 30 hours.

This is a Severity Level III violation."

Response to Violation I

Prior to the EDG trip on September 28, the EDG was thought to be operable. Thus, operation of Unit 2 for a period in excess of the time allowed by the EDG T/S was not intentional, but rather resulted from a failure to recognize that the EDG was inoperable due to a low lube oil condition. Subsequent to the EDG trip, the EDG was immediately declared inoperable and corrective and preventive actions were initiated. All T/S requirements were satisfied subsequent to the trip.

The minimum lube oil tank level necessary for EDG operability has been determined to be 212 gallons. This amount includes the minimum tank level at which the engine-driven lube oil pump can maintain suction (135 gallons) plus engine drawdown which was determined through measurement to be 77 gallons. Based on this information, and the average B&A pump leak, the EDG could have become inoperable as early as September 2, 1992. This differs slightly from the date of September 10, 1992, mentioned in the violation. Our calculated date was based on actual drawdown measurements on the Unit 2 AB EDG. The NRC value was based on drawdown measurements taken on a different EDG, during the special inspection. (The Unit 2 AB diesel was not in a condition during the inspection that allowed drawdown data to be taken.)

The EDG trip was of significant concern to Cook Nuclear Plant management. Immediate actions were taken to ensure that similar problems did not exist on the other EDGs, and to ensure that damage had not been done to the Unit 2 AB diesel due to the low lube oil condition. The Plant Manager set up a Multidisciplinary Task Force to look at the event, determine root and contributing causes, and determine necessary corrective and preventive actions. The Operations Superintendent also established a task force that was chartered to review the operations tour and data gathering processes for improvements that could help prevent an event of this nature in the future. The corrective and preventive actions taken as a result of the trip will be discussed in more detail below.

Although the Unit 2 AB diesel was rendered inoperable by the low lube oil condition, the event is believed to have low safety significance. This is based on the fact that offsite power (both preferred and reserve) was available continuously throughout the time period that the EDG was inoperable. Additionally, the redundant Unit 2 CD EDG was operable throughout the period (with the exception of approximately 10 minutes during a surveillance run.) An analysis of the impact of this event on the probabilistic risk assessment analyses performed for the Cook Nuclear Plant indicated that the increase in core melt frequency was only approximately 3%. This small impact is due to the reliability of the offsite power sources as well as the reliability of the redundant EDG.

1. Admission or Denial of the Alleged Violation

Indiana Michigan Power admits to the violation as cited in the NRC Notice of Violation.

2. Reasons for the Violation

The actual cause of the EDG trip was a low level in the lube oil tank. The cause of the low lube oil level was a leak that had developed in the B&A pump seal. The root cause of the event has been determined to be our failure to identify an adverse lube oil level trend. Contributing factors included our failure to recognize that the lube oil level was below the acceptance criteria for this parameter, as well as failure of the level alarm to actuate and failure of the level indicator to provide an accurate reading. The root and contributing causes will be discussed in more detail below.

3. Corrective Actions Taken and Results Achieved

Immediately following the EDG trip on September 28, it was determined through measurement of the tank level with a tape measure that the cause of the trip was low lube oil level in the lube oil tank. The lube oil level in the lube oil tanks for the other 3 EDGs were checked that same day. Prior to restoration of the Unit 2 AB EDG to operable status on October 5, the following actions were completed:

- a. The lube oil tank level was restored to the normal operating range.
- b. All visible bearing surfaces were visually inspected for abnormal wear.
- c. A lift check was performed for two of the EDG bearings. The bearings that were lift checked were bearing no. 4, since it is the most heavily loaded, and bearing no. 7, since it is at the furthest end of the lube oil header.

- d. Bearing no. 4 was pulled and inspected. Some deterioration was evident and was attributable to normal wear. The bearing lower half was replaced as a precautionary measure.
- e. The defective B&A pump seal was replaced, eliminating the lube oil leak.
- f. The lube oil sump tank low level alarm switch was disassembled and cleaned, to restore proper operation.
- g. The level indicator's calibration was checked and determined to be adequate. The gauge was vented and returned to service.

4. Corrective Action Taken to Avoid Further Violations

Daily dip measurements of lube oil tank level were initiated on September 28, and still continue. Additionally, the surveillance test procedure for the monthly EDG operability test has been revised to require recording of lube oil level prior to EDG start.

5. Date When Full Compliance will be Achieved

At the time of the EDG trip, Unit 2 was in Mode 5. T/Ss only require one EDG to be operable in this mode. This function was performed by the redundant Unit 2 CD EDG. The Unit 2 AB EDG was restored to operable status on October 5, 1992.

NRC Violation II A

"10 CFR Part 50, Appendix B, Criterion V., requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with those instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Contrary to the above, Test No. 73A of Attachment No. 2 of licensee procedure "Preventative Maintenance and Performance Monitoring Surveillance Testing for Non Technical Specification Equipment," Revision 10, April 19, 1990, which monitored the lube oil inventory and is a surveillance activity affecting quality, did not contain minimum acceptance criteria for the EDG lube oil volume.

This is a Severity Level IV violation."

Response to Violation II A

Although the acceptance criteria was not included in OHI-5030 (which recorded lube oil level on a weekly basis), the administrative limit was included in the shiftly Operations Department tour guide, OHI-4030 STP.001.001. The issue, therefore, was not failure to have acceptance criteria in plant procedures, but rather one of maintaining the acceptance criteria in a location consistent with human factors considerations. Because the level gauge was not seismically qualified, the gauge was isolated during normal operations by a manual valve. In order to read the level gauge, the operator had to valve it into service, and valve position had to be independently verified after restoration. The level gauge is located in an area that is now considered to be a confined space, per OSHA regulations. Entry into this area requires special air monitoring equipment, for personnel protection. With these considerations, the lube oil level was monitored during the weekly surveillance rather than during the shiftly operator tour.

The ability of the operators to recognize that lube oil tank level was below the administrative limit was hampered by instrumentation failures as well as inadequacies in the lube oil level trending process. These issues are discussed in the response to Violation II B, below.

1. Admission or Denial of the Alleged Violation

Indiana Michigan Power admits to the violation as cited in the NRC Notice of Violation.

2. Reasons for the Violation

As discussed above, acceptance criteria was provided to the operators, but in a location that did not adequately consider human factors considerations.

3. Corrective Actions Taken and Results Achieved

On October 30, procedure OHI-5030 was revised to include the administrative limit of 400 gallons on the data sheet. The revision also modified the data sheet such that 7 consecutive lube oil level (daily) readings are recorded.

4. Corrective Action Taken to Avoid Further Violations

The corrective actions taken to avoid further violations are discussed in the response to Violation II B, below.

5. Date When Full Compliance will be Achieved

Full compliance was achieved on October 30, 1992, when procedure OHI-5030 was modified to include the administrative limit of 400 gallons on the lube oil data sheet.

NRC Violation II B

"10 CFR Part 50, Appendix B, Criterion XVI, requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, are promptly identified and corrected.

Contrary to the above, on May 9, 1992, the licensee identified that a pump seal on the Unit 2 "AB" EDG "Before and After" pump was leaking lube oil, a condition adverse to quality, but failed to promptly correct the constantly dropping proper level of oil in the EDG lube oil tank or maintain a proper level until after September 24, 1992.

This is a Severity Level IV violation."

Response to Violation II B

The failure to maintain a proper level of lube oil in the tank was due to the failure of the Operations Department to recognize the adverse trend of decreasing lube oil level. The level recorded by Operations during the weekly surveillances decreased from an indicated 737 gallons on April 29 to an indicated 309 gallons on September 28. The weekly lube oil readings are provided to the Unit Supervisors for review. This review is intended to identify adverse trends. However, at the time of the event the Unit Supervisors would only have had available in the control room the present week's surveillance results and the results from the previous week. Due to data scatter two consecutive weekly data points would not necessarily have been a good indicator of an adverse trend. Although the overall trend during the period from late April through late September was clearly downward, there were weeks where the level readings actually increased from the previous week. Corrective actions discussed below address improvements we are making to the Operations trending process.

The failure of the Operations Department to maintain the proper level in the tank was complicated by equipment failures. At the time of the trip, the level gauge was reading 309 gallons, versus the actual level in the tank of 127 gallons. The error in the reading has been attributed to the presence of air in the sensing line. The present level gauges were installed in April 1991, to replace level instrumentation that had become obsolete. In order to avoid adding new penetrations to the lube oil tank, the decision was made to install the level gauges on an existing sample line. The design as originally specified called for the level gauge to be installed horizontal to the sample piping, which would have precluded an air problem. Due to obstructions, the final design installed the gauge on a riser, approximately one foot above the sample pipe. Appropriate reviews and approvals were obtained for the change to the original design. However, it was not recognized by the personnel involved that the change introduced the possibility of air entering the sensing line during operation of the sample valve. Subsequent to the trip, the level indicator's calibration was checked and determined

to be adequate. However, the gauges are currently considered to be inoperable due to the design deficiency. The design is considered to be non-standard in that it is not our normal practice to have level instrumentation installed on sample lines.

The lube oil low level alarm, which should have alarmed once level reached approximately 395 gallons in the tank, failed to actuate. During diagnostic testing, the alarm operated intermittently. This suggested that some foreign matter may have been in the pivots of the alarm switch, although none was observed. The low level alarm switch mechanism was cleaned and the intermittent operation could no longer be duplicated. The level alarms receive an inspection every four years as part of our preventive maintenance program. We reviewed the vendor recommended maintenance practices for these devices, as well as our maintenance history and the industry operating experience (INPO's Nuclear Plant Reliability Data System) for these devices. The available information indicated no deficiencies in our level alarm maintenance program. Nevertheless, corrective actions we will be taking to preclude recurrence are discussed below.

1. Admission or Denial of the Alleged Violation

Indiana Michigan Power admits to the violation as cited in the NRC Notice of Violation.

2. Reasons for the Violation

As discussed above, the violation resulted from the failure of the Operations Department to recognize an adverse trend of decreasing lube oil level. Contributing factors included failure of the lube oil level alarm to actuate, and the failure of the level indicator to provide an accurate reading. Also contributing to the event was the fact that the administrative limit of 400 gallons for lube oil tank inventory was not included on the data sheet used for the weekly lube oil level surveillance. (See Violation II A.)

3. Corrective Actions Taken and Results Achieved

Lube oil level was restored to its proper level prior to declaring the EDG operable on October 5, 1992.

4. Corrective Action Taken to Avoid Further Violations

The following corrective actions address both Violations II A and II B.

Within two days of the EDG trip, the Operations Department Superintendent issued a memo to the operating shifts informing them of the issues and establishing a task force to review Operations tour and data gathering processes for possible improvements. The following corrective actions arose from that task force:

- a. A review of the tour procedures will be conducted to determine appropriate critical parameters that should be monitored during the tours. The review will also examine acceptance criteria, communication methods, and trending methods for these critical parameters. This review will be completed by June 30, 1993.
- b. A tour assignment policy was issued to require, whenever possible, that an operator be assigned a plant tour for a long enough period to establish a sense of personal ownership of that tour. This policy was issued January 22, 1993.
- c. All tour operators will complete a review of the tour procedures, including plant walkthroughs. This activity will be completed by March 31, 1993.
- d. A tour guide, sized to fit in a pocket, to be used for reference only by the tour operators will be issued by March 31, 1993.

Regarding the level alarm failure, we verified proper operation of the Unit 1 AB diesel generator lube oil tank level alarm on February 9, 1993. We will verify proper operation of the level alarms on the other three EDG lube oil tanks during the next scheduled outages for those EDGs. We also will increase the frequency of level alarm operational checks from once every four years to every refueling outage, and increase the scope such that it includes a full operational check.

Regarding the issue of level gauge inaccuracies due to air in the sensing line, we will review other level gauge installations for similar deficiencies. This review will be completed by March 15, 1993.

5. Date When Full Compliance will be Achieved

Full compliance was achieved on October 5, 1992, when the Unit 2 AB EDG was declared operable with adequate lube oil level.