

DCS

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Detroit  
Edison

10 CFR 2.201

June 20, 1996  
NRC-96-0057

Mr. James Lieberman  
Director, Office of Enforcement  
U. S. Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

- References:
- 1) Fermi 2  
NRC Docket No. 50-341  
NRC License No. NPF-43
  - 2) Integrated Inspection Report No. 50-341/96002; 50-016/96002,  
dated April 4, 1996
  - 3) Notice of Violation and Proposed Imposition of Civil Penalty -  
\$50,000 (NRC Inspection Report No. 50-341/96002), dated  
May 21, 1996
  - 4) Licensee Event Report (LER) No. 96-001, dated March 6, 1996

Subject: Reply to a Notice of Violation (EA 96-095)

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IE14

Dear Mr. Lieberman:

Enclosed is Detroit Edison's response to a Notice of Violation (EA 96-095) which is described in Reference 2 and contained in Reference 3. This violation involves the failure of Detroit Edison to promptly take action to identify and correct a potential common cause failure of the Ultimate Heat Sink service water pumps during an event in early February 1996. A check for \$50,000.00, payable to the Treasurer of the United States, is also enclosed for payment of the full amount of the Civil Penalty.

*Rec'd w/check*

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PDR ADOCK 05000341  
G PDR

Detroit Edison management recognizes the serious nature of this event due to the potential loss of cooling function for both divisions of the Emergency Diesel Generators and that a more conservative course of action should have been pursued during the initial investigation of this event. Higher priority should have been given to considering the possibility of a common cause failure and ascertaining whether the other service water pumps in the Residual Heat Removal Complex were capable of starting and providing their safety function earlier in the event. It is the expectation that the Fermi 2 staff will be more sensitive to any potential common cause failure mechanisms and take the appropriate, conservative actions to expeditiously confirm system and component operability. This increased sensitivity has been demonstrated on a number of occasions since this event, however, Detroit Edison management clearly recognizes that conservative decision making in all aspects of plant operation is a fundamental concept that must be continually reinforced to the plant staff to achieve sustained plant performance.

Detroit Edison admits the violation did occur and does not intend to dispute any of the facts or circumstances surrounding the violation. However, it is worthy to note that the violation for which the Civil Penalty was imposed differs from the apparent violation discussed in Reference 2 and during the predecisional enforcement conference on April 15, 1996. A review of this practice indicates that it is allowed under the "General Statement of Policy and Procedures for NRC Enforcement Actions," NUREG-1600. Detroit Edison would have welcomed the opportunity to provide additional information for the NRC's consideration in this matter at the point the apparent violation was changed from a violation of 10 CFR 50, Appendix A, Criterion 2, "Design Bases for Protection Against Natural Phenomena" to a violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." It is suggested that the NRC reconsider the use of this practice in future escalated enforcement matters.

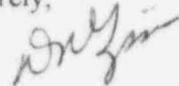
The following actions, in addition to those described in Reference 4, have been or will be taken:

- Safety-related pumps and pumps in applications that are important to plant operation (e. g., General Service Water, Circulating Water) of similar design and configuration have been reviewed for susceptibility to ice binding. Since the occurrence of this event, other issues associated with the performance of plant equipment in extreme cold weather conditions have been evaluated and resolved through the corrective action process. Additional reviews of plant equipment configurations where extreme cold weather conditions could adversely impact equipment important to plant operation are under consideration. Deficiencies identified as part of the additional reviews will be resolved through the corrective action process. It is anticipated that these reviews and the resolution of the identified deficiencies will be completed before next winter.

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Should you have any questions regarding this response, please contact Mr. Norman K. Peterson, Supervisor - Compliance at (313) 586-4258.

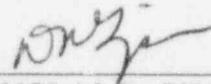
Sincerely,



Enclosures

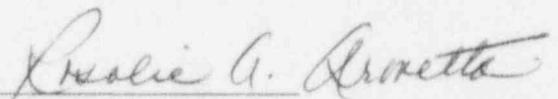
cc: Document Control Desk  
M. J. Jordan  
H. J. Miller  
D. V. Pickett  
A. Vogel  
Region III

I, DOUGLAS R. GIPSON, do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.



DOUGLAS R. GIPSON  
Senior Vice President  
Nuclear Generation

On this 20th day of June, 1996, before me personally appeared Douglas R. Gipson, being first duly sworn and says that he executed the foregoing as his free act and deed.



Notary Public

ROSALIE A. ARMETTA  
NOTARY PUBLIC - MONROE COUNTY, MI  
MY COMMISSION EXPIRES 10/11/99

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## REPLY TO A NOTICE OF VIOLATION

### Alleged Violation

During an NRC inspection conducted on January 9 through March 19, 1996, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the Nuclear Regulatory Commission proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U. S. C. 2282, and 10 CFR 2.205. The particular violation and associated civil penalty are set forth below:

10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

Contrary to the above, from approximately 8:36 p. m. on February 5, 1996, until 7:26 p. m. on February 6, 1996, the licensee failed to promptly take action to identify and correct a potential common failure of the Ultimate Heat Sink service water pumps, a significant condition adverse to quality. Specifically, on February 5, 1996, at 2:31 p. m., Diesel Generator Service Water (DGSW) pump C failed to develop normal discharge pressure, flow and motor current. By 8:36 p. m. on February 5, there was sufficient evidence of icing to warrant testing the Division 2 pumps after (1) the Plant Manager and NRC Senior Resident Inspector had observed icicles hanging from the DGSW pump C minimum flow valve, and (2) pressurization of DGSW pump C with air allowed it to run normally. However, testing of the Division 2 Ultimate Heat Sink service water pumps was not initiated until 7:26 p. m. on February 6, 1996. (01013)

This is a Severity Level III violation (Supplement I)  
Civil Penalty - \$50,000.

### Detroit Edison Response

#### 1. Admission or Denial of the Alleged Violation:

Detroit Edison admits the violation occurred.

2. The Reasons for the Violation If Admitted, and If Denied, the Reasons Why:

The reason this violation occurred was that the Fermi 2 staff failed to take conservative actions to consider the possibility of a common cause failure of other safety-related service water pumps located in the vicinity of Diesel Generator Service Water (DGSW) Pump 'C'.

When DGSW Pump 'C' was found to be inoperable at approximately 1431 hours on February 5, 1996, the focus of the staff was to determine the cause of the pump failure and promptly restore it to operable status. The cause of the DGSW Pump 'C' failure during the initial pump start attempt was attributed to binding of the pump shaft due to ice formation on the pump shaft and spider bearings. Subsequent pump start failures were attributed to ice blockage in the pump discharge column. Water entered the pump casing and column from the DGSW system by leaking past the pump discharge check valve. The water then froze on the pump shaft and spider bearings before it could drain to the reservoir due to the cold ambient conditions in the vicinity of the pump.

After the potential for the failure mechanism that caused DGSW Pump 'C' to become inoperable was recognized, the Fermi 2 staff rationalized there was no need to take immediate actions, beyond those actions required by the Technical Specifications, to ensure the safety-related service water pumps in the redundant division were operable. The Fermi 2 staff believed that a common cause failure of the service water pumps in the redundant division was unlikely because:

- To the best of the recollection of those personnel involved, the plant had no previous history of service water pump inoperability during cold weather operations. In fact, the plant had operated in weather conditions more extreme than those present in early February 1996 and no significant service water pump problems were evident.
- DGSW Pump 'A' had been successfully tested immediately prior to testing DGSW Pump 'C'. These two pumps are in the same division (Division 1) and are physically located within a few feet of each other in the Residual Heat Removal (RHR) Complex. Thus, it would be expected that these pumps would have been subjected to very similar service conditions and would have performed similarly.
- It was the general belief of the Fermi 2 staff that the design of the RHR Complex and the service water pumps housed in the RHR Complex had adequately accounted for operations during extreme cold weather conditions. The rooms housing the pumps are heated during the winter months and the reservoir water temperature is maintained well above freezing to comply with the Technical Specifications. In addition, the service water pumps are designed to drain the water contained in the pump casing and column above the reservoir level upon securing the pumps.

- The temperatures measured in the air space below the service water pumps and above the reservoir in the redundant division (Division 2) of the RHR Complex were a few degrees higher than those measured in the Division 1 air space. Thus, the staff concluded that the Division 2 pumps would be less susceptible to freezing than the Division 1 pumps.
- The Division 2 service water pumps had been run approximately three days prior to the discovery of the failure of DGSW Pump 'C'. No problems or indications symptomatic of ice binding or blockage were noted during the operation of the pumps.

The error in the decision making process was further compounded by a prevailing mindset that manifested itself in the Fermi 2 staff. The staff believed that a documentation review was sufficient to verify operability of redundant equipment. Although this practice is in literal compliance with the Technical Specifications, it is now recognized that it is not applicable in all situations, especially those where common cause failure mechanisms are evident.

Secondly, the staff believed that complete surveillance tests would have been needed to be performed to properly demonstrate operability of redundant trains of equipment. Because these surveillance tests normally take a substantial amount of time to perform in their entirety, it was thought that the resources devoted to performing these surveillance tests would be better utilized in promptly determining the root cause of the DGSW Pump 'C' failure.

Lastly, because of past NRC criticism of the adequacy of the Fermi 2 corrective action program, the staff desired to fully understand the root cause of the failure of DGSW Pump 'C' before applying the information to similar situations. This contributed to the common cause failure mechanism not being aggressively pursued by the plant staff.

Therefore, for the reasons described above, the Fermi 2 staff concluded that the appropriate course of action was to first determine the root cause of the DGSW Pump 'C' failure and restore it to operable status. The next priority was to confirm the operability of the remaining Division 1 service water pumps followed by confirmation of the operability of the Division 2 service water pumps. This course of action led to the Fermi 2 staff failing to take adequate action, as promptly as it should have, to assure that a common cause failure of the safety-related service water pumps in Division 2 had not occurred.

### 3. The Corrective Steps That Have Been Taken and the Results Achieved:

When DGSW Pump 'C' became inoperable on February 5, 1996, a multi-disciplined team was established to determine the cause of the pump failure, restore it to operable status, and to formulate the course of action to resolve the issues surrounding the event.

As stated above, the cause of the DGSW Pump 'C' failure was ice binding of the pump shaft and ice blockage of the pump discharge column. During the troubleshooting effort for the DGSW Pump 'C' failure, the pump was purged with air and run in order to remove the pump restrictions. The pump was then successfully started and run at 2021 hours on February 5, 1996 and was considered functional. However, the pump was still considered inoperable pending completion of an engineering evaluation addressing the effects of starting the pump while it was bound. The engineering evaluation was completed and the pump was declared operable at 1910 hours on February 6, 1996.

The remaining Division 1 safety-related service water pumps were satisfactorily started and run by 1640 hours on February 6, 1996. The Division 2 safety-related service water pumps were satisfactorily started and run between 1926 hours and 1945 hours on February 6, 1996. It should be noted that when DGSW Pump 'B' was started, it initially showed the same symptoms as DGSW Pump 'C'. However, the pump parameters returned to normal after approximately 90 seconds and the pump was not considered to be inoperable. At this time, all of the safety-related service water pumps located in the RHR Complex had been run and were confirmed to be operable.

Administrative controls in the form of Night Orders to monitor the temperatures in the air space below the RHR Complex pump rooms on a shiftly basis were put into place shortly after this event. The monitoring of the air space was to be initiated whenever outside temperature fell below 36 degrees Fahrenheit. The Night Orders directed that, should the air space temperature for a particular division of the RHR Complex fall below 36 degrees Fahrenheit for three consecutive shifts, the safety-related service water pumps were to be started and run to confirm their operability. The administrative controls described above were later incorporated into the appropriate procedures which will remain in effect until design changes are made.

A senior management critique was conducted shortly after the event that addressed the management issues associated with the event, including recognition of potential common cause failures. A memorandum from the Senior Vice President was distributed to Operations, Engineering, Licensing, and Training personnel to discuss the event, its causes, and the lessons learned. The memorandum emphasized the recognition of and sensitivity to potential common cause failures. Members of these departments were required to personally acknowledge reading and understanding the memorandum. Discussions of the information covered in this memorandum were also conducted with each of the operating shifts.

A further assessment of staff training needs was also conducted, based on the lessons learned from this event and direct feedback provided by the Senior Vice President from interviews he conducted with Licensed Operators. Additional staff and management training has been conducted. This training was geared toward Licensed Operators, Engineering and selected plant staff personnel, as well as plant

management. The training was conducted using a case study format that opened with a personal message from the Senior Vice President and emphasized the senior management perspective of this event. The interrelationship between the plant design basis, the Updated Final Safety Analysis Report, the Technical Specifications, and plant procedures was presented. Examples of potential common cause failures and the appropriate actions to take upon identification of a potential common cause failure were discussed in detail.

4. The Corrective Steps That Will Be Taken To Avoid Further Violations:

Design changes to prevent freezing in the safety-related service water pumps located in the RHR Complex are currently under evaluation. It is anticipated that design changes resulting from this evaluation will be in place before next winter.

Safety-related pumps and pumps in applications that are important to plant operation (e. g., General Service Water, Circulating Water) of similar design and configuration have been reviewed for susceptibility to ice binding. Since the occurrence of this event, other issues associated with the performance of plant equipment in extreme cold weather conditions have been evaluated and resolved through the corrective action process. Additional reviews of plant equipment configurations where extreme cold weather conditions could adversely impact equipment important to plant operation are under consideration. Deficiencies identified as part of the additional reviews will be resolved through the corrective action process. It is anticipated that these reviews and the resolution of the identified deficiencies will also be completed before next winter.

Conservative decision making in the operation of Fermi 2 is clearly a management expectation that must be continuously reinforced to the plant staff and management. The need for conservative plant operation has recently become an issue emphasized at all plants by the Institute of Nuclear Power Operations (INPO) in response to numerous industry events that have occurred over the past few years. To this end, Detroit Edison intends to further integrate this fundamental concept into continuing training for plant operators as well as for other members of the plant staff.

5. The Date When Full Compliance Will Be Achieved:

Full compliance with 10 CFR 50, Appendix B, Criterion XVI was achieved at 1945 hours on February 6, 1996 when actions to identify and correct the potential common cause failure of the safety-related service water pumps located in the RHR Complex were completed. At that time, both divisions of safety-related service water pumps had been satisfactorily started and run, and were considered operable. The additional actions described above will ensure continued compliance.