Douglas R. Gipson
Senior Vice President
Nuclear Generation

Detroit Edison

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December 22, 1994
NRC-94-0118

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

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) NRC Inspection Report 50-341/94012,
dated November 23, 1994

Subject: Response to Notice of Violation 94012

Enclosed is Detroit Edison's response to the Notice of Violation contained in Reference 2.

The following commitments are being made in this letter:

1. In response to NOV 94-012-01A, Design Calculations DC-2912, and DC-2913 to remove fuse interrupt rating and reference Specification 3071-128-STD-EZ-01. DC-5272 and Specification 3071-128-STD-EZ-01 will be revised to add a table to list fuses and their interrupt rating by March 31, 1995.

2. Training will be provided to Electrical and Instrument and Control engineers for fuse selection and the application of fuse rating once DC-5272 and Specification 3071-128-STD-EZ-01 is revised

3. In response to NOV 94-012-03C, the procedure on Preventative Maintenance (PM) will be revised to clarify that any exceptions noted in work packages must be documented in the summary section by March 31, 1995.

4. The Superintendent of Maintenance will discuss the need to ensure proper and complete documentation in PM work packages in an upcoming Maintenance newsletter.

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5. In response to Unresolved Item (URI) 94-012-04, Detroit Edison commits to generate computer models of the impacted systems and heat exchangers and to determine the available pump and system margin. This review will be completed by June 15, 1995.

6. In response to URI 94-012-04, Detroit Edison will also review the basis for the current ECCS pump test program. This will be completed by June 15, 1995.

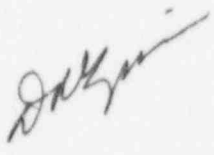
7. In response to URI 94-012-05, Detroit Edison will revise procedure SOP 23.208 to contain a caution regarding excessive flow during single Residual Heat Removal Service Water pump operation by March 31, 1995.

Detroit Edison was encouraged by the NRC recognition of our prompt and effective corrective actions with respect to the ABB breaker refurbishment and inadequate Technical Specification overlap and logic system functional testing.

Specifically with respect to the ABB breaker refurbishment, Detroit Edison would like to note that all safety related breakers were verified to be functional prior to refurbishment and to date no failure has been caused by hardened grease. After hardened grease was found in the first few breaker types refurbished, a decision was made to refurbish all safety related HK and K-line breakers along with 21 Balance of Plant HK breakers. This action is consistent with Detroit Edison's goal of returning Fermi 2 to the best material condition possible following our extended shutdown.

If there are any questions related to this response, please contact Elizabeth A. Hare, Senior Compliance Engineer, at (313) 586-1427.

Sincerely,



Enclosure

cc: T. G. Colburn
J. B. Martin
M. P. Phillips
A. Vegel

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

On this 22nd day of December, 1994, before me personally appeared Douglas R. Gipson, being first duly sworn and says that he executed the foregoing as his free act and deed.

Rosalie A. Armetta
Notary Public

ROSALIE A ARMETTA
NOTARY PUBLIC STATE OF MICHIGAN
MONROE COUNTY
MY COMMISSION EXP. NOV. 20,1995

I. Statement of Noncompliance 94-012-01A

10 CFR Part 50, Appendix B, Criterion III, requires, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as, by performance of design reviews, by the use of alternative simplified calculation methods, or by the performance of a suitable testing program.

Contrary to the above, the following example of inadequate design control measures was identified:

As of September 13, 1994, incorrect fuse interrupt ratings were used in the latest revision to fuse coordination calculations DC-2912 and DC-2913 which were attached to modification packages EDP-13850 and EDP-14022. The fuse interrupt ratings that were used were for AC circuit applications and were inappropriate for the DC circuits affected by the modifications.

Reason for the Violation

EDP-13850 and EDP-14022 were issued to replace Bussmann type FRN fuses with Bussmann type NONs. The basis for the replacement was to provide fuse coordination between the main feeder fuse protection and the branch feeder fuse protection. The NON fuse interrupt rating used during the design process was for AC circuits applications and was not applicable for the DC circuits. The appropriate design calculations DC-2912 and DC-2319 were revised at the time to include the incorrect DC interrupt rating for NON fuses.

Specifically EDP-13850 and EDP-14022 incorrectly listed the FRN-R-5A and NON-5A fuse interrupt rating at 125VDC as 200,000 Amps and 50,000 Amps respectively. The correct interrupt rating for 125VDC applications for the FRN-R-5A and NON-5A fuse is 20,000 Amps and 10,000 Amps respectively.

Inattention to detail was determined to be the root cause. The vendor catalog only lists interrupt rating values for AC application. The catalog states that Bussmann must be contacted for DC ratings. The use of the AC interrupt rating for DC application was not appropriate.

Corrective Actions Taken and Results Achieved

In response to the NRC concern during the NRC E&TS inspection, it was concluded that fuses with DC interrupt rating of 10,000 Amps and higher d[illegible] create an operability concern.

Corrective Actions to Be Taken To Prevent Recurrence

DC-2[illegible] and DC-2913 will be revised to remove the fuse interrupt rating, and reference Specification 3071-128-STD-EZ-01 that will contain a table for various fuses and their approved interrupt rating.

DC-5272 will be revised to add a table that lists fuses and their interrupt rating including the bases for the DC interrupt rating. Specification 3071-128-STD-EZ-01 will be revised to add a table that lists fuses and their interrupt rating.

Training will be provided to Electrical and Instrument and Control (I&C) engineers for fuse selection and the application of fuse rating once DC-5272 and Specification 3071-128-STD-EZ-01 is revised.

Date When Full Compliance Will Be Achieved

The Design Calculations and Specification will be revised by March 31, 1995.

II. Statement of Noncompliance 94-012-01B

10 CFR Part 50, Appendix B, Criterion III, requires, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as, by performance of design reviews, by the use of alternative simplified calculation methods, or by the performance of a suitable testing program.

Contrary to the above, the following example of inadequate design control measures was identified:

Prior to September 22, 1994, original vendor design requirements regarding the grounding of Emergency Diesel Generator (EDG) underfrequency protective relays were not translated into design drawings and field verifications.

Reason for the Violation

The issue identified during the inspection was an original plant design/construction error dating back to approximately 1976. The design drawings generated by the Architect Engineer (A/E), Sargent & Lundy (S&L) and the EDG vendor (Colt Industries) omitted the required ground at terminal 6 of the underfrequency relays.

As noted in the inspection report, one schematic drawing for EDG #11 generated by the A/E indicated a ground connection to terminal 6. Three other schematic drawings and four wiring diagrams indicated no ground connection. This omission of the ground was consistent with the Vendor (Colt Industries) supplied drawings of schematic and wiring (point to point wiring) diagrams. It is not known how the required ground was included on the A/E schematic for EDG #11.

Subsequent review in response to EDG #14 output breaker trip on September 22, 1994, determined that the G.E. Instructions Manual GEK-36849 indicated a ground connection at terminal 6 on the internal (figure 3) and external (figure 4) connection diagrams. All of the above indicated that the lack of a ground connection was made at the initial issue of plant design and that the original design reviewers should have been aware of the need for a ground connection, as G.E. Instruction Manual GEK-36849 indicated the required ground. It could not be determined specifically how this error took place 18 years ago.

An opportunity existed in 1985 for Plant Engineering to become aware of the concern that the subject relay was ungrounded at terminal 6. This opportunity was the as-built walkdown program performed in 1985. This program consisted of two activities. The first was a physical walkdown of the Diesel Control Panels and the Diesel Switchgear vs. the wiring diagrams. This would not have found the problem, as the wiring diagrams did not show the ground. The second portion was a review of schematic vs. wiring diagrams. This review was done by S&L and was documented for Detroit Edison by DER NO-85-356. Pages 8 and 9 of this DER referenced the EDG #11 diagram that did indicate a ground was present. These DER pages would lead to the conclusion that this drawing was used in the review. However, a ground on the schematic drawing and not on the wiring diagram was not noted during the S&L review. Therefore, this one opportunity to become aware of the lack of a ground was missed. The intent of the walkdowns was not to review the Fermi design vs. Vendor design. They were only meant to find design errors between Fermi schematic drawings vs. wiring diagrams vs. actual wiring in panels.

The Vendor Manual VME8-1.2.6 (GEK-36849), which shows the correct grounding configuration, is a sub-set of the complete EDG Manual VME8-1.0, issued in 1988. This sub-set was issued at the same time that the full EDG manual was issued. Vendor Manual reviews evaluate the impact on Operations and Maintenance program and procedures. It is not the intent to perform an original design review verification. Thus it is not expected that the included diagram would be compared to Fermi design drawings to verify previously accepted design.

Corrective Actions Taken and Results Achieved

Engineering Design Package EDP-27116 has been issued and implemented to connect terminal 6 of the underfrequency relay to ground in all four station EDGs as corrective action. The design change was completed in October, 1994. A review to determine if other SFF21A relays were used in the plant was also performed. No additional relays were identified.

Corrective Actions to Be Taken To Prevent Recurrence

No additional corrective steps are necessary to avoid further violations as present design controls exist through the Engineering Design Package and Design Verification procedures that require checking and verification of all new safety related design packages. As part of this process, the designer would consider vendor supplied information in his design.

Date When Full Compliance Will Be Achieved

Detroit Edison is currently in compliance with 10 CFR 50, Appendix B, Criterion III.

III. Statement of Noncompliance 94-012-02A

10 CFR 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 be accomplished in accordance with these instructions, procedures, or drawings.

Fermi's Design Specification No. 3071-128-EP requires that shear (tension) links be used in cable pulling to preclude exceeding the maximum allowable pulling tension for the cable. Similarly, Maintenance Procedure No. 35.CON.013, "Cable Pulling," Revision 23, requires use of a calibrated tension metering device for monitoring cable pulling tension.

Contrary to the above, on September 1, 1994, the team determined that cables associated with EDP-13092 were pulled without tension links, breakable line or a tension monitoring device. Subsequently, the licensee identified 134 additional cables that were pulled since 1990 with no apparent evidence of tension monitoring devices.

Reason for the Violation

During the NRC inspection, Deviation Event Report 94-0465 was initiated to determine root cause and evaluate the necessary corrective actions to prevent recurrence. Procedure 35.CON.013 as written, did not provide provisions to pull cables without the use of a tension measure device. The Modification Engineer overseeing the cable pulling for EDP-13092 did not ensure that the appropriate tension monitoring device was used to ensure that the allowable tension was not exceeded.

There was a misunderstanding by the Modification Engineer, of the intent of Plant Engineering to accept the quality of the cables based upon a post pull electrical testing. The Modification Engineer also considered that the allowable pulling tensions were sufficiently high, the conduit runs were relatively short and the outer jackets of the new cables were fiberglass (a relatively low coefficient of friction). Therefore, it was concluded by the Modification Engineer that it would not be possible to exceed the pulling tension. While these reasons may provide technical justification to pull without a tension monitoring devices, the procedure contained no provisions for doing so.

Corrective Actions Taken and Results Achieved

To determine if additional cables were pulled without using a tension monitoring device, Plant Engineering reviewed 550 work packages that involved cable pulling since 1985. Of these, 134 cables were identified as either QA level 1 or Balance of Plant (BOP) in QA 1 raceway and did not have a record of having used a tension monitoring device while pulling cables. These cables were evaluated by Plant Engineering. The method utilized worst case pulling techniques, actual conduit arrangement and conservative friction factors. At the request of the NRC E&TS team leader, this evaluation was sent to NRC Region III and NRC contractor support personnel. This evaluation was reviewed by the NRC, with no additional concerns raised. Design Calculation DC-5682, Volume 1, documented the analysis of the cable pulling tension. Based on this analysis, all cables were found to be acceptable.

Procedure 35.CON.013, Section 4.3 was revised to clarify the requirements for a tension measure device and states as follows, "a full justification shall be documented in the work package prior to pulling cables which are pulled without using tension monitoring device ...". In addition, Attachment 1 to 35.CON.013, "Cable Pulling Maintenance Data Sheet," was revised to be more user friendly. It was felt that this attachment could have been a contributing factor in the root cause of the violation in that it was difficult to use when group cable pulls were involved. Design Specification No. 3071-128-EP was also revised in a similar

manner. Concurrence of these changes was obtained between Plant Engineering and the Modification organizations.

Corrective Actions to Be Taken To Prevent Recurrence

Modification Engineers were counseled on the need for procedure compliance.

Date When Full Compliance Will Be Achieved

Detroit Edison is currently in compliance with 10 CFR 50, Appendix B, Criterion V.

IV. Statement of Noncompliance 94-012-02B

10 CFR 50, Appendix B, Criterion V, requires, in part, that activities effecting quality be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances, and be accomplished in accordance with these instructions, procedures, or drawings.

DER 93-0560 documented a change in material for an environmentally qualified component which was appropriately classified as an "Equivalent Part Identification." Section 5.4 of Revision 8 of Procedure FIP-CM1-01, "Technical Service Request," requires that a preliminary safety evaluation be performed for an equivalent part identification to determine if a 10 CFR 50.59 safety evaluation was required.

Contrary to the above, as of September 13, 1994, a preliminary safety evaluation was not performed for the equivalent part identification to determine if a 10 CFR 50.59 safety evaluation was required.

Reason for the Violation

Technical Service Request (TSR) 26037 was initiated by Material Engineering & Support (ME&S) to resolve the difference between the filler material listed in the Environmental Qualifications (EQ) Maintenance and Surveillance (M&S) and Technical & Engineering Services (T&ES) Report 93A70-105 for a phenolic terminal assembly used in the Main Steam Isolation Valve manifold assembly. TSR 26037 was processed in November 1993, using FIP-CM1-01, Revision 8, which was issued September 8, 1993. Revision 8 re-engineered the Design Change process and implemented the new TSR process.

Under the former process, ME&S would prepare a proposed disposition and forward the Potential Design Change (PDC) to EQ for review, additional evaluation and documentation. EQ would sign the PDC as concurred by and

return it to ME&S for approval. The preparer in ME&S would review EQ's evaluation, complete a preliminary evaluation, obtain an approval signature and then forward the PDC to ETS for processing. Under the new TSR process, there are only two signature blocks, preparer and checker. Because both blocks had been completed by EQ Group, ME&S did not look to see that all required documentation had been completed. EQ personnel only performed their required evaluation. ME&S did not check to see if a preliminary evaluation had been written because the TSR had been signed off by the checker.

Corrective Actions Taken and Results Achieved

TSR-26037 Revision A was issued on September 28, 1994 and a Deviation Event Report 94-0509 was issued to evaluate the extent of the problem. Plant Engineering has reviewed all completed TSRs to verify that preliminary evaluations (PE) have been performed, as required. Three additional TSRs were identified which lacked a complete preliminary evaluation. TSR 26022 contained a PE but the approval signature was missing, and TSRs 26187 and 26326 did not contain a PE at all. All three TSRs have been revised to include a completed PE.

These four TSRs were processed within the first five months the new TSR process was implemented. No occurrences in the last nine months were identified.

In October and November 1994, all Organizations that are authorized to disposition TSRs, were trained on FIP-CM1-01, Revision 9. It specifically covered the requirement for including PEs.

Corrective Actions to Be Taken To Prevent Recurrence

Based on the fact that there have been no recurrence in the last nine months, it has been concluded that the Plant Engineering organizations associated with equivalent part evaluations have gained a good working knowledge of the new TSR process. No additional corrective action will be required.

Date When Full Compliance Will Be Achieved

Detroit Edison is currently in compliance with 10 CFR 50, Appendix B, Criterion V.

V. Statement of Noncompliance 94-012-3C

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

Contrary to the above, the following example of inadequate corrective action was identified:

As of September 22, 1994, the licensee failed to initiate a Potential Design Change (PDC) or a Technical Service Request (TSR) to investigate and correct a design deficiency which was identified by the Relay Group in 1991 and 1992 and documented in work requests and maintenance test procedures. The Relay Group documented actuation of the EDG underfrequency relays was not indicated by the relay flag during testing. Test results were reviewed by maintenance and signed off as satisfactory by all reviewers, even though the required relay response was not observed.

Reason for the Violation

Detroit Edison did have several opportunities to identify and/or resolve the design inadequacy of the EDG #14 underfrequency relay target flag. In 1989 and twice in 1992, Preventative Maintenance (PM) event W851 was performed and included in its activities the testing of the underfrequency relay via procedure 35.318.010, "SIF Static Underfrequency Relay Testing," and post maintenance and restoration to verify resetting targets via procedure 35.328.002, "Electrical Scheme Checkout." However, even though the body of the work packages documented the fact that the flag was not operating properly due to inadequate coil current, it was not included in the summary section. No corrective action was initiated. In all three instances, because the relay was capable of performing its critical design function of tripping the diesel breaker during parallel operation to the off-site system, the lack of the target flag feature was not considered a calibration failure. The load on the target coil circuit was not drawing adequate current to seal in the target at a target top setting of .2 Amp.

Currently, during the implementation of a PM, if an item requiring corrective maintenance is encountered several options are possible:

- Fix, document, and assign it a status code PEC, (Problems Encountered-Corrective Maintenance).
- Maintenance can write a trouble shooting work request then determine corrective action; repair if possible or write a DER or Technical Service Request (TSR) for further evaluation.

Corrective Actions Taken and Results Achieved

EDP-27116 was completed in October 1994, to connect terminal 6 of the underfrequency relay to ground for all four EDGs. The target coil current was increased so that the flag would seal in.

A sample review of field completed PMs was performed by the PM group. There were numerous instances of notes made internal to the work package that were not documented under the summary of work completed. Some packages were incorrectly status coded AE for completed "As Expected." Based on this review, the PM coordinators are performing a complete review of the entire PM event work packages to ensure all notes or comments are properly identified and the appropriate corrective action is performed to address any deficiency. This review contains current and future PM work packages.

If a PM work package is determined to be deficient in either the code status or documentation in the work package summary, direct interface will be performed between the PM coordinators and the Nuclear Journeyman and the job Foreman as applicable. This feedback to the maintenance workers will reinforce their understanding of management's expectations with respect to complete documentation in a work package and the importance it plays in ensuring proper corrective actions are taken when problems are encountered.

Quality Assurance performs selected reviews of work packages for closure. Any discrepancy noted is brought to the attention of the assigned maintenance foreman for resolution.

Corrective Actions to Be Taken To Prevent Recurrence

As the quality of documentation in PM work packages improves, the PM group will decrease their review to sampling on an as needed basis. The Superintendent of Maintenance will discuss the need to ensure proper and complete documentation in PM work packages in an upcoming Maintenance Newsletter. The procedure on Preventative Maintenance will be revised to clarify that any exceptions noted in the work package must be documented in the summary section. If a troubleshooting work request is initiated due to the event, the work request number is to be documented in the PM summary sheet. This procedure revision will be completed by March 31, 1994.

Date When Full Compliance Will Be Achieved

Detroit Edison is currently in compliance with 10 CFR 50, Appendix B, Criterion XVI.

VI. Statement of NRC Unresolved Item 94-012-04

The team's review of the RHRSW (DC-0201, Revision C) and EECW design hydraulic calculations (DC-4934, Volume I, Revision A & Volume III-DCD, Revision 0) revealed that their conclusions were based on use of the vendor's certified pump curves which were not corrected for the ASME Section XI

allowable degradation limits. These results (flow rates) were used to assess the capability of the safety-related (SR) heat exchangers (HX). Since the allowable pump degradation is 10%, the flow rates used for the assessment of the SR HX performance were not conservative. This condition was further exacerbated by use of the hydraulic models which were not field validated, and thus introducing another uncertainty (potential nonconservatisms) in the flow rate values.

During this review, the following questions were raised:

- What are the bases for Fermi's ability to meet the licensing commitments related to the Safe Shutdown requirements (heat transfer from the SR loads to the ultimate heat sink)?

- Is the above concern also applicable to the ECCS pump? Were the system operability determinations based on the maximum potential (future) pump degradation? Was the instrument error consider in the operability determinations?

Detroit Edison Response

A review of the original calculations associated with the safety related Service Water Systems indicates that they were conservative in nature. A 20% contingency was applied to the pump curve capacities to account for actual pipe routing and pump wear. Later revisions to these calculations that compensated for actual pipe routing and design modifications show that the projected margin for pump degradation had decreased to near zero.

The pumps in question are normally run only for testing and during outages, and therefore would be expected to see minimal if any degradation. This is confirmed by the Fermi Section XI test program which shows little or no degradation. Any degradation is felt to be well within other existing conservatisms that have been included in the various Service Water system calculations. Examples of these conservatisms can be seen in the Design Calculation , DC-0182 for the Ultimate Heat Sink Reservoir:

- A 9% margin is documented with the Reservoir at Technical Specification level of 580 feet.
- A 100% margin for Mechanical Draft Cooling Tower (MDCT) drift loss was included.
- A 10% margin for MDCT evaporation loss was included.

It is recognized by Detroit Edison that it is not a good practice to operate long term with limited pump margin. In order to reduce this potential, Detroit Edison will:

- Generate computer models of the impacted systems and heat exchangers.
- Validate by calculation and field data acquisition the computer models.
- Utilize the validated models to determine available pump and system margins.
- Determine design margin and take any necessary corrective actions.

This review will be completed by June 15, 1995. It should be noted that during the coming cold weather months, the reservoir temperature will be well below the Technical Specification limit of 80 degrees Fahrenheit. This cooler reservoir temperature adds further assurance that the systems can perform their safety related functions while the above review is performed.

An NRC question was also raised concerning the margin for the Emergency Core Cooling Systems (ECCS) pumps. These pumps are tested to Technical Specification required values and are either operable or inoperable. If inoperable, the appropriate Technical Specification Action would be taken. The values to which these pumps are tested have been compensated to account for instrument error. Detroit Edison will review the basis for the current pump test program. This review will also be completed by June 15, 1995.

VII. Statement of NRC Unresolved Item 94-012-05

Calculation DC-0201, available net positive suction head (NPSHa), was based on the assumption that the RHRSW flow for single pump operation can be limited to 4,500 gpm. Review of emergency operating procedures (EOP) 29.000.01, .02, and .03 and standard emergency operating procedures (SOP) 23.208 did not address a potential for having only 1 RHRSW pump available for the RHRSW injection in the Reactor Pressure Vessel (RPV). An additional evaluation performed by the licensee indicated that this alignment could lead to flow rates substantially higher than 4,500 gpm.

Detroit Edison Response

Calculation DC-0201 documents several hydraulic calculations for the RHRSW System. All of these calculations are based on two pump RHRSW System (for either division of RHRSW) flow with flowrate per pump of 4,500 gpm or less. Therefore, the basis of the hydraulic calculations in DC-0201 is correct.

A single RHRSW pump does not satisfy design heat removal requirements. System design parameters have been established based on two pump RHRSW flow. The two "single" failures (loss of power to one division and trip of a running pump) required to lose three RHRSW pumps is beyond the plant design basis. However, for RPV injection mode as required in the EOPs, a single RHRSW pump can satisfy design flow requirements.

Discharge flow must by throttled to avoid pump runout if one operating pump trips. The current SOP 23.208 does not discuss steady-state single pump operation (only during startup or shutdown). EOP 29.000.01, .02, and .03 refer to SOP 23.208 for system operation instructions. The potential for RHR Service Water pump runout, if one pump trips during 2 pump operation, was self identified in the preparation of Design Basis Document E11-XX, RHR Service Water System. Open item E11XX-011-02 was generated to address this concern. The corrective action taken was to develop a Professional Advice (PRO ADS) comment form for adding a caution statement to SOP 23.208 regarding single pump operation. SOP 23.208 will be revised to contain the appropriate information by March 31, 1995.

This unresolved item is based on degraded plant conditions beyond design basis. If design basis plant conditions are considered, the hydraulic calculations are correct. The plant procedures are consistent with calculation.