UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

March 6, 2012

Mr. Jack M. Davis
Senior Vice President and
Chief Nuclear Officer
Detroit Edison Company
Fermi 2 - 210 NOC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: FERMI POWER PLANT, UNIT 2, EVALUATIONS OF CHANGES, TESTS, OR EXPERIMENTS ANDPERMANENT PLANT MODIFICATIONS BASELINE INSPECTION REPORT 05000341/2012007(DRS)

Dear Mr. Davis:

On February 2, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications Inspection at your Fermi Power Plant. The enclosed inspection report documents the inspection results which were discussed on February 2, 2012, with Mr. T. Conner and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, two NRC-identified findings of very low safety significance were identified. The findings involved violations of NRC requirements. However, because of their very low safety significance and because the issues were entered into your corrective action program, the NRC is treating these issues as Non-Cited Violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the subject or severity of any NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission – Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Fermi Power Plant. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Fermi Power Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Hironori Peterson, Acting Chief
Engineering Branch 3
Division of Reactor Safety

Docket Nos.: 50-341
License Nos.: NPF-43

Enclosure: Inspection Report 05000341/2012007(DRS)
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ™

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos.:	50-341
License Nos.:	NPF-43
Report No:	05000341/2012007(DRS)
Licensee:	Detroit Edison Company
Facility:	Fermi Power Plant, Unit 2
Location:	Newport, MI
Dates:	January, 17, 2012, through February 2, 2012
Inspectors:	Alan Dahbur, Senior Reactor Inspector (Lead) Jasmine A. Gilliam, Reactor Inspector Ronald Langstaff, Senior Reactor Inspector Melvin Holmberg, Senior Reactor Inspector
Observer:	I. Hafeez, Engineering Inspector, Observer
Approved by:	Hironori Peterson, Acting Chief Engineering Branch 3 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000341/2012007(DRS); 01/17/2012 – 02/02/2012; Fermi Power Plant, Unit 2; Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications.

This report covers a two-week announced baseline inspection on evaluations of changes, tests, or experiments and permanent plant modifications. The inspection was conducted by Region III based engineering inspectors. Two findings were identified by the inspectors. The findings were considered Non-Cited Violations (NCVs) of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Cross-cutting aspects were determined using IMC 0310, "Components Within the Cross-Cutting Areas." Findings for which the SDP does not apply may be (Green) or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

- Severity Level IV: The inspectors identified a Severity Level IV, Non-Cited Violation (NCV) of 10 CFR 50.59(d)(1), "Changes, Tests, and Experiments," and an associated (Green) finding for the licensee's failure to provide an adequate written safety evaluation to demonstrate that application of the On-Line NobleChem™ (OLNC) process did not require a license amendment. Specifically, the licensee had not provided an evaluation to demonstrate that application of the OLNC process did not increase the likelihood for hydrogen induced detonation and piping failures for six areas of the balance of plant (BOP) piping susceptible to hydrogen accumulation. The licensee entered the issue into its corrective action program as CARD 12-20812 and intended to revise safety evaluation No.10-0286 to provide an adequate written basis for the OLNC process prior to the next scheduled application of OLNC materials.

  The finding was determined to be more than minor because the inspectors could not reasonably determine if the application of the OLNC process would not have required NRC prior approval (e.g., a license amendment). The finding was also determined to be more than minor because the finding was associated with the Initiating Events Cornerstone attribute of Equipment Performance and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. Absent NRC identification, the licensee would have continued to introduce OLNC materials into the reactor feed system without confirming that the OLNC process did not increase the likelihood for hydrogen induced detonation and piping failures in the BOP piping segments that would upset plant stability and challenge safety systems. The finding was of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip AND the likelihood that mitigation equipment or functions will not be available. This finding has a cross-cutting aspect in the Decision Making component of the Human Performance cross-cutting area because the licensee did not use conservative assumptions to ensure the proposed action was safe. Specifically, the licensee's failure to provide a written safety evaluation, which demonstrated that application of the OLNC process did not increase the likelihood for

hydrogen induced detonation and piping failures was the result of a non-conservative assumption that the OLNC process was safe (IMC 0310, Item H.1(b)). (Section 1R17.1b)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to identify and correct a condition adverse to quality. Specifically, the licensee failed to identify and evaluate that the installed Neutral Grounding Resistors (NGRs) for emergency diesel generators (EDGs) exceeded the maximum design value specified in the design basis calculation. The field measurement data obtained by the licensee in support of the 4.16kV cable replacement modification, in November 2011, exceeded the design value of 4.225 ohms specified in calculation DC-5373. The licensee entered this issue into their corrective action program to revise the design calculation to incorporate using the measured or the resistor's maximum tolerance value.

  The inspectors determined that the finding was more than minor because the finding was associated with the Mitigating Systems cornerstone's attribute of Equipment Performance and affected the cornerstone's objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the licensee failed to assure that the measured NRG for EDG-11 and EDG-13, which exceeded the maximum design value specified in the design basis calculation would perform their design function during overvoltage and fault conditions. The finding was of very low safety significance because it did not result in a loss of operability. No cross-cutting aspects were associated with this finding. (Section 1R17.2b)

B. Licensee-Identified Violations

No violations of significance were identified.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications (71111.17)

.1 Evaluation of Changes, Tests, or Experiments

a. Inspection Scope

From January 17 through February 2, 2011, the inspectors reviewed seven safety evaluations performed pursuant to Title 10, Code of Federal Regulations (CFR) Part 50, and Section 59 to determine if the evaluations were adequate and that prior NRC approval was obtained as appropriate. The inspectors also reviewed 13 screenings where licensee personnel had determined that a 10 CFR 50.59 evaluation was not necessary. The inspectors reviewed these documents to determine if:

- the changes, tests, or experiments performed were evaluated in accordance with 10 CFR 50.59 and that sufficient documentation existed to confirm that a license amendment was not required;
- the safety issue requiring the change, tests or experiment was resolved;
- the licensee conclusions for evaluations of changes, tests, or experiments were correct and consistent with 10 CFR 50.59; and
- the design and licensing basis documentation was updated to reflect the change.

The inspectors used, in part, Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Implementation," Revision 1, to determine acceptability of the completed evaluations, and screenings. The NEI document was endorsed by the NRC in Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," dated November 2000. The inspectors also consulted Part 9900 of the NRC Inspection Manual, "10 CFR Guidance for 10 CFR 50.59, Changes, Tests, and Experiments."

This inspection constituted seven samples of evaluations and 14 samples of changes as defined in IP 71111.17-04.

b. Findings

Inadequate Safety Evaluation for the Online Noble Chemical Metal Process

Introduction: The inspectors identified a Severity Level IV, NCV of 10 CFR 50.59(d)(1), "Changes, Tests, and Experiments," and an associated (Green) finding for the licensee's failure to provide an adequate written safety evaluation to demonstrate that the application of the On-Line NobleChem™ (OLNC) process did not require a license amendment. Specifically, the licensee had not provided an evaluation to demonstrate that application of the OLNC process did not increase the likelihood for hydrogen

induced detonation and piping failures for six areas of the balance of plant (BOP) piping susceptible to hydrogen accumulation.

Description: From March 27 through April 9, 2011, the licensee introduced noble metal solutions into the Reactor Feedwater (RF) system in support of the OLNC process, which resulted in deposition of noble metals on the wetted surfaces of the reactor vessel, core and attached plant piping systems. The OLNC process is designed to facilitate an environment that mitigates the potential for inter-granular stress corrosion cracking (IGSCC) of core materials and the noble metals also act as a catalyst for the recombination of hydrogen and oxygen. A portion of the OLNC materials added to the RF system also carry over into the BOP systems. For six areas in the BOP piping systems susceptible to hydrogen accumulation, the licensee had not provided an evaluation to demonstrate that application of the OLNC process did not increase the likelihood for hydrogen induced detonation and piping failure.

Hydrogen has the highest burning velocity of any gas, is combustible over a wide range of concentrations, and has very low ignition energy (e.g., can self ignite under expansion). Hydrogen and oxygen are formed by the radiological decomposition of water passing through the operating reactor core and hydrogen is intentionally introduced through the RF system to maintain an environment within the reactor that mitigates the potential for IGSCC of core materials. Hydrogen and air (or oxygen) present in the mainsteam (MS) and attached BOP systems can accumulate over time if susceptible pipe configurations and favorable operating conditions exist. Accumulation of hydrogen has led to detonation and pipe ruptures at foreign reactors (Reference NRC IN-2002-15 “Potential Hydrogen Combustion Events in BWR [Boiling Water Reactor] Piping”).

The licensee elected to apply the OLNC process to reduce the amount of hydrogen required to maintain an environment that mitigates the potential for IGSCC of core materials. On May 17, 2010, the licensee’s approved a vendor document GEH-OLNC-0000-0099-7942-02-R0 “On-Line NobleChem™ Application Technical Safety Evaluation for Fermi Unit 2,” Revision 0, which provided the vendor’s technical basis for OLNC process. In this document, the vendor identified a concern for the potential burning or detonation of the hydrogen/oxygen mixture in branch steam piping segments (including the offgas (OG) system) initiated by the catalytic effect of the OLNC materials which carry over into BOP piping. The vendor recommended that all plants with OLNC evaluate and eliminate "at-risk" piping configurations that may have a chance of accumulating hydrogen and oxygen. In condition assessment resolution document (CARD) No. 02-12570, the licensee applied a vendor screening process (SIL 643 “Potential for Radiolytic Gas Detonation”) and identified six BOP piping segments with a potential to accumulate hydrogen (to detonable levels), which included: the shell side relief valve piping (heaters 5N, 5S, 6N and 6S), the MS supply to OG system, and the vacuum line to the extraction line from the west moisture separator reheater. The licensee concluded that the leakage through valve packing or seat would limit hydrogen buildup in these pipe segments below detonable levels, without providing a basis for this conclusion. For this conclusion to be correct, the rate of loss of hydrogen through valve seats or packing must be greater than the hydrogen accumulation rate. However, the licensee did not have information on rate of hydrogen accumulation nor leakage from these “at-risk” BOP pipe segments. Additionally, the licensee had not eliminated these “at-risk” piping segments as recommended by the OLNC process vendor in

GEH-OLNC-0000-0099-7942-02-R0. The licensee subsequently provided the inspectors with Revision 2 of GEH-OLNC-0000-0099-7942-02-R0, in which the OLNC vendor concluded this issue was not of concern, because Fermi had implemented the recommendations of SIL 643, "Potential for Radiolytic Gas Detonation." However, the licensee was not able to provide a basis for the OLNC vendor's conclusion, nor could the licensee staff explain how the application of the vendor's SIL 643 process ensured that accumulation of combustible mixtures of hydrogen within the six areas of BOP piping would not occur.

In EDP 36240, "On-Line Noble Chemistry Injection Skid Implementation Related Plant Changes," the licensee approved modifications to the feed system, which provided the equipment needed for addition of the catalytic materials used the OLNC process. On October 14, 2010, the licensee approved SE 10-0286 "Provide Evaluation of Noble Metal Solution Injected into Reactor Feed System, (EDP 36240)." In this SE, the licensee documented their basis for implementation of the OLNC process which introduced/deposited noble metal catalysts onto the wetted surfaces of the reactor, fuel and associated piping systems. Because, the OLNC deposited material on the wetted surface of reactor plant components, the licensee considered the impact of this change on the reactor coolant system and attached piping system functions. However, the licensee did not evaluate the catalytic effect of OLNC to potentially increase the failure probability for the six piping areas in the BOP piping systems susceptible to hydrogen accumulation and potential detonation events identified by the licensee in CARD 02-12570.

Line M-3261-1 is one of the BOP pipe segments potentially susceptible to hydrogen accumulation and this line normally provides steam to the steam jet air ejectors, off gas preheaters and steam jet air ejector discharge manifold. If this line were to fail, it would result in a rapid loss of the steam supply to all four steam jet air ejectors, causing a loss of condenser vacuum and plant trip which would adversely affect the UFSAR stated MS and OG system functions. Specifically, the UFSAR Section 10.3.12 describes that the MS system functions which included providing a supply of steam to: the turbine generator, reactor feed pump turbines, turbine seal system and flange warming and to supply excess steam to the condenser. And, UFSAR Section 11.3.2.7.4 describes the OG system functions which included: processing OG rate at 1000,000 microcuries per second, maintaining hydrogen in the gases from the air ejectors to below flammability limits, protection against inadvertent release of significant quantities of gaseous and particulate radioactive materials, and ensuring in-plant occupational radiation exposures due to operation of the OG system are as low as practical. If the ONLC process caused a more than minimal increase (Reference 10 CFR 50.59(c)2(ii)) in the likelihood of failure of a BOP pipe segment (e.g., Line M-3261-1), it would adversely affect the UFSAR design functions for the OG and MS systems and require prior NRC review and approval (e.g., a licensee amendment). Therefore, the inspectors could not confirm that the proposed change (introduction of ONLC materials) would not have required a license amendment pursuant to 10 CFR 50.90.

Because only a single application of the OLNC had been applied and the effects of a catalyst are cumulative, the licensee did not have an operability or functionality concern for the MS or OG system. As a corrective action, the licensee documented in CARD No. 12-20812, that the hydrogen detonation concerns noted in SIL 643 were not discussed in SE 10-0286. The licensee intended to revise SE 10-0286 to provide an

adequate written basis for the OLNC process prior to the next scheduled application of OLNC materials.

Analysis: The inspectors determined that the failure to provide a written safety evaluation to demonstrate that application of the OLNC process did not increase the likelihood for hydrogen induced detonation and piping failures was contrary to the requirements of 10 CFR 50.59(d)(1) and a performance deficiency.

Because violations of 10 CFR 50.59 are considered to be violations that potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process. The finding was determined to be more than minor because the inspectors could not reasonably determine if the application of the OLNC process would not have required NRC prior approval (e.g., a license amendment). The finding was also determined to be more than minor because the finding was associated with the Initiating Events Cornerstone attribute of Equipment Performance and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. Absent NRC identification, the licensee would have continued to introduce OLNC materials into the RF system without confirming that the OLNC process did not increase the likelihood for hydrogen induced detonation and piping failures in the BOP piping segments that would upset plant stability and challenge safety systems.

Although violations of 10 CFR 50.59 are dispositioned using the traditional enforcement process, if possible, the underlying technical issue is evaluated under the SDP to determine the severity of the violation. The inspectors evaluated this finding in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a, for the Initiating Events Cornerstone, and answered "no" to the "Transient Initiators" question "Does the finding contribute to both the likelihood of a reactor trip AND the likelihood that mitigation equipment or functions will not be available"? Therefore, the issue screened as having very low safety significance (Green).

This finding has a cross-cutting aspect in the Decision Making component of the Human Performance cross-cutting area because the licensee did not use conservative assumptions to ensure the proposed action was safe (IMC 0310, Item H.1(b)). Specifically, the licensee's failure to provide a written safety evaluation which demonstrated that application of the OLNC process did not increase the likelihood for hydrogen induced detonation and piping failures was the result of a non-conservative assumption that the OLNC process was safe. The inspectors reached this conclusion based on discussions with licensee staff and review of associated records.

Enforcement: Title 10 CFR 50.59, "Changes, Tests, and Experiments," Section (d)(1) requires, in part, the licensee to maintain records of changes in the facility, of changes in procedures, and of tests and experiments. These records must include a written evaluation which provides a basis for the determination that the change, test, or experiment does not require a license amendment pursuant to10 CFR 50.59(c)(2).

Contrary to this requirement, from March 27 through April 9, 2011, the licensee introduced OLNC through the RF system (EDP 36240) resulting in deposition of noble metals on wetted surfaces of plant systems (e.g., a change), without a written evaluation which provided an adequate basis for the determination that this change did not require a license amendment. Specifically, the licensee failed to provide a written evaluation,

which demonstrated the OLNC process had not increased the probability for failure of six BOP piping segments susceptible to hydrogen accumulation and potential detonation. In accordance with the NRC Enforcement Policy, this violation was classified as a Severity Level IV violation because the underlying technical issue was of very low risk significance. Because the underlying technical issue of this violation was of a very low safety significance, was not repetitive or willful, and was entered into the licensee's corrective action program (CARD No. 12-20812), it is being treated as a Severity Level IV NCV, consistent with Section 2.3.2 and Section 6 of the NRC Enforcement Policy. (Severity Level IV NCV 05000341/2012007-01 (DRS); Inadequate 10 CFR 50.59 Evaluation for the On-Line NobleChem™ Process).

The associated finding is evaluated separately from the traditional enforcement violation and, therefore, the finding is being assigned a separate tracking number (FIN 05000341/2012007-02(DRS); Inadequate 10 CFR 50.59 Evaluation for the On-Line NobleChem™ Process). The licensee entered the issue into its corrective action program (CARD No. 12-20812) and intended to revise SE 10-0286 to provide an adequate written basis for the OLNC process.

.2 Permanent Plant Modifications

a. Inspection Scope

From January 17 through February 2, 2012, the inspectors reviewed seven permanent plant modifications that had been installed in the plant during the last three years. This review included in-plant walkdowns for portions of the EDG cables to 4.16kV buses replacement modifications. The modifications were selected based upon risk significance, safety significance, and complexity. The inspectors reviewed the modifications selected to determine if:

- the supporting design and licensing basis documentation was updated;
- the changes were in accordance with the specified design requirements;
- the procedures and training plans affected by the modification have been adequately updated;
- the test documentation as required by the applicable test programs has been updated; and
- post-modification testing adequately verified system operability and/or functionality.

The inspectors also used applicable industry standards to evaluate acceptability of the modifications. The list of modifications and other documents reviewed by the inspectors is included as an Attachment to this report.

This inspection constituted seven permanent plant modification samples as defined in IP 71111.17-04.

b. Findings

Failure to Identify EDG's Neutral Grounding Resistor Exceeded its Design Value

Introduction: The inspectors identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to identify and correct a condition adverse to quality. Specifically, the licensee failed to identify and evaluate that the installed Neutral Grounding Resistors (NRGs) for emergency diesel generators EDG-11 and EDG-13 exceeded the maximum design values. The licensee had measured the installed NGRs for these diesels in support of the 4.16kV cables replacement modification. The field measured data exceeded the design value of 4.225 ohms specified in the design basis calculation.

Description: Design Calculation DC-5373 "Calculation for the Neutral Grounding Resistor for the Emergency Diesel Generators, "Revision C, was completed in June 2006. The objective of this design calculation was to verify the adequacy of the neutral grounding resistor to provide the proper protection for the Emergency Diesel Generators against transient and fault current conditions based on the parameters of the installed generator and cables. The calculation concluded that maximum grounding resistor value of 4.225 ohms was required to provide the required kilowatt (KW) loss equal to or greater than the charging kilovolt-ampere reactive (KVAR). Because the installed resistor value was 4.2 ohms, the licensee concluded that the installed resistor was adequately sized to protect the EDG and its associated component from damage. However, the inspectors noted that the calculation results were based upon the cabling and circuits for EDG-11, and showed that the calculated charging KVAR value was 4.545 while the resistor KW loss was 4.57. This provided a 0.025 ohms margin, which allowed excess charging of only 0.025 KVAR.

Design Calculation DC-5373 was revised in December 2009 and again in December 2011 to incorporate design changes associated with modification EDP-35607 "Underground Cable Replacement." The revised calculation concluded that a neutral grounding resistor, not to exceed, 4.783 ohms for EDG-12 and 14 and 3.8 ohms for EDG-11 and 13 were required to accommodate the cable replacement modification. These changes of the required neutral grounding resistors were due to changes for the total circuit capacitance for the modified cables.

The methodology used in this calculation was based on the principle that the dissipative resistive KW should be equal to or greater than the capacitive charging KVAR of the EDG distribution system. This method was in accordance with the Westinghouse Handbook, the Beeman Industrial Power System Handbook and IEEE Standard 141-1993, "IEEE Recommended Practice for Electrical Power Distribution for Industrial Plant."

In support of EDP-35607 cable replacement modification, the licensee, in October 2011 gathered field data for the installed neutral grounding resistors for EDG-11 and EDG-13 per Work Orders 33392120 and 32963066 respectively. The field data confirmed that the grounding resistor was Hubbell Model V38W4200FB, rated 4.2 ohms, 38 amps. It had six tap points from end to end designated "A" through "F" front to back. The average measured values for these resistors between taps "A" and "F" were between 4.26 and 4.36 and 4.36-4.6 ohms for EDG-11 and between 4.36 and 4.6 ohms for

EDG-13. The average measured values between the remaining taps were 3.6 ohms. The taps between “A” and “F” points were used for the installed design.

The inspectors determined that the installed resistors were within +10 percent tolerance permitted in the design and manufacturing of the resistor per IEEE Standard 32-1972, “IEEE Standard Requirements, Terminology, and Test Procedure for Neutral Grounding Devices.” However, the licensee failed to consider the manufacturing tolerance in the design basis calculation.

The inspectors determined that the licensee missed the opportunity to identify and evaluate a condition adverse to quality when they performed field measurements for the planned modification. The licensee had the information related to both the design basis calculation maximum resistor values and the actual field values, but failed to recognize that the NGR design basis was exceeded, specifically for EDG-11 and EDG-13. This resulted in the licensee failure to assure proper protection for their associated EDG against transient overvoltage and fault current conditions. Upon the inspector identification of this issue, the licensee entered this issue into their corrective action program as CARD 12-20624 to incorporate the tolerance considerations in the absence of actual measured values into their respective calculations. Preliminary investigation by the licensee found that design calculation DC-5373, Revision “C” conservatively used a dielectric constant (k) of 6.0 for rubber cable insulation in calculating the total EDG system cable capacitance. The EDG underground cables actually have EPR insulation material that a dielectric constant of 4.0 was more appropriate, as shown in the NEMA/ICEA WC 74 Standard, “5-46 KV Shielded Power Cable for Use in the Transmission and Distribution Electric Energy.” The licensee performed a preliminary calculation using the +10 percent resistor tolerance and the actual EPR 4.0 dielectric constant. This preliminary calculation showed for the EDG underground cables, the dissipative NGR current was greater than the capacitive charging current for the existing systems and therefore, there was no operability concern.

Analysis: The inspectors determined that failure to identify and correct a condition adverse to quality that affected the Neutral Grounding Resistors for emergency diesel generators was contrary to 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” and was a performance deficiency. Specifically, the licensee failed to identify and evaluate a deviation between the installed NGR measured values associated with EDG-11 and EDG-13 and the design basis calculation value, although it had all necessary information to do so. The measured NGRs exceeded the maximum design value specified in the calculation. The licensee had the ability to identify the problem because the field resistor data gathering was done as part of a modification which also involved revisions to the design basis calculation.

The finding was more than minor because the finding was associated with the Mitigating Systems cornerstone’s attribute of Equipment Performance and affected the cornerstone’s objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the licensee failed to assure that the measured NGR for EDG-11 and EDG-13, which exceeded the maximum design value of 4.225 ohms as specified in the design basis calculation would perform their design function during an overvoltage and fault conditions.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process" Attachment 0609.04, "Phase I - Initial Screening and Characterization of findings," Table 4a, "Characterization Worksheet for IE, MS, and BI Cornerstones." The inspectors determined that the cornerstone best reflecting the dominant risk was the Mitigating Systems cornerstone. The inspectors confirmed that the finding did not result in a loss of operability or functionality per "Part 9900, Technical Guidance, Operability Determination Process for Operability and Functional Assessment," because the licensee was able to demonstrate per preliminary calculation that the installed NGRs were adequate for the existing system configuration. Therefore, this finding was of very low safety significance (Green).

Although, the licensee has measured the NGRs in November 2011 the inspectors did not identify a cross-cutting aspect associated with this finding because the information gathering per the work orders were not intended to validate the adequacy of the existing design but rather to be used in the future modification for the EDG feeder cables to the 4.16kV buses replacement project.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," 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, and non-conformances are promptly identified and corrected.

Contrary to the above, as of February 2, 2012, the licensee failed to identify a condition adverse to quality. Specifically, on November 2, 2011, the licensee measured the installed neutral grounding resistors associated with EDG-11 and EDG-13. However, the licensee failed to recognize that the installed resistors exceeded the maximum value of 4.225 ohms specified in design basis calculation Dc-5373, Revision C. The measured installed resisters exceeded the maximum calculation value of 4.225 ohms.

Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as CARD 12-20624, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 05000341/2012007-03(DRS), Failure to Identify EDG's Neutral Grounding Resistor Exceeded its Design Value).

4. OTHER ACTIVITIES (OA)

4OA2 Problem Identification and Resolution

.1 Routine Review of Condition Reports

a. Inspection Scope

From January 17 through February 2, 2012, the inspectors reviewed several corrective action process documents that identified or were related to 10 CFR 50.59 evaluations and permanent plant modifications. The inspectors reviewed these documents to evaluate the effectiveness of corrective actions related to evaluations of changes, tests, or experiments and permanent plant modifications. In addition, corrective action documents written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problems into the corrective action system. The specific corrective action documents that were sampled and reviewed by the inspectors are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

4OA6 Meetings

.1 Exit Meeting Summary

On February 2, 2012, the inspectors presented the inspection results to Mr. Todd Conner and other members of the licensee staff. The licensee personnel acknowledged the inspection results presented and did not identify any proprietary content. The inspectors confirmed that all proprietary material reviewed during the inspection was returned to the licensee staff.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

T. Conner, Plant Manager
M. Caragher, Engineering Director
R. Johnson, Licensing Manager
G. Strobel, Operations Manager
J. Pendergast, Licensing Engineer
R. Salmon, Compliance Supervisor
J. Yeager, Engineering Assurance Supervisor
G. Baarson, Principal Engineer
M. McLaughlin, Plant Support Engineer
S. Berry, System Manger
J. Thorson, Performance Improvement Manager
S. Hanson, Licensing Engineer
W. Mayes, Engineering Supervisor (Mechanical)

Nuclear Regulatory Commission

M. Morris, Senior Resident Inspector
R. Jones, Resident Inspector

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000341/2012007-01(DRS)	NCV	Inadequate Safety Evaluation for the Online Noble Chemical Metal Process (Section 1R17.1b)
05000341/2012007-02(DRS)	FIN	Inadequate Safety Evaluation for the Online Noble Chemical Metal Process (Section 1R17.1b)
05000341/2012007-03(DRS)	NCV	Failure to Identify EDG's Neutral Grounding Resistor Exceeded its Design Values (Section 1R17.2b)

Closed

05000341/2012007-01(DRS)	NCV	Inadequate Safety Evaluation for the Online Noble Chemical Metal Process (Section 1R17.1b)
05000341/2012007-02(DRS)	FIN	Inadequate Safety Evaluation for the Online Noble Chemical Metal Process (Section 1R17.1b)
05000341/2012007-03(DRS)	NCV	Failure to Identify EDG's Neutral Grounding Resistor Exceeded its Design Values (Section 1R17.2b)

Discussed

None.

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

10 CFR 50.59 EVALUATIONS

Number	Description or Title	Date or Revision
09-0210	EDP 35607-Replacement of Cables and Duct Banks for EDG Feeder Cables to 4.16kV Buses	December 15, 2009
07-0272	Revise HPCI design head/flow requirement and IST criteria basis (TSR-35395 and DC-6371 VOL I, rev. 0)	0
09-0088	TSR-36108 As-Built of Revised ECCS Suction Strainer Design Debris Source Term and Impacted Hydraulic and Structural Analyses	0
10-0181	TSR-36527: Upgrade DC-0367 VOL I Rev. (letter) O, Hydraulic Calculations for the RHR System, and revise ECCS performance requirements for LPCI shutoff head	0
10-0286	Provide Evaluation of Noble Metal Solution Injected into RF System, EDP 36240	0
10-0095		
11-0225	Temp Mod 11-0026 will Allow Opening of 4 Turbine Building Roof Vents for Additional Convection / Cooling above the TB2 Deck	0

10 CFR 50.59 SCREENINGS

Number	Description or Title	Date or Revision
09-0143	Extended Use for Free Air Cables Installed per TSR-27016	June 17, 2009
10-0047	Delete TRSR 3.8.3.1 and Associated Bases TR B3.8.3 Requiring Maintenance Per Vendor Recommendations	February 15,2010
10-0061	Engineered Safety Features Auxiliary Electrical Distribution System	February 23, 2010
10-0132	Revise RXX-00 and R30-00 to reflect EDG Voltage and Frequency Ranges	April 4, 2010
10-275	Engineered Safety Features Auxiliary Electrical Distribution System	September 14, 2010
11-0013	Uninterruptible Power Supply System	January 20, 2011
09-0129	EDP-35477, Torus Water Level Setpoint Change for HPCI Suction Swap	0
09-0139	LPCI and CS Pump Acceptance Criteria and LOCA Inputs	0
09-0181	23.202, High Pressure Coolant Injection System	0
09-0301	LPCI and CS Pump Acceptance Criteria and LOCA Inputs	0
10-0150	23.307, Emergency Diesel Generator System	0
10-0244	23.206, Reactor Core Isolation Cooling System	0
09-0204	20.205.01, Loss of Shutdown Cooling	0

10 CFR 50.59 SCREENINGS

Number	Description or Title	Date or Revision
10-0348	8D46, Division I Reactor Building High/Low	0

CALCULATIONS

Number	Description or Title	Date or Revision
DC-5079, Volume 1	LPCI Pump Acceptance Criteria and LOCA Inputs	0
DC-5979	Estimation of debris sources for ECCS suction strainers	0
DC-6373	HPCI design head/flow requirements and IST Criteria	0
DC-5373 Volume 1	Calculation for the Neutral Grounding Resistor for the Emergency Diesel Generators	C

CORRECTIVE ACTION PROGRAM DOCUMENTS ISSUED DURING INSPECTION

Number	Description or Title	Date or Revision
12-20855	NRC 2012 Mod/50.59 Inspection - Suppression Pool Strainer Visual Inspection	February 1, 2012
12-20559	NRC 2012 Mod/50.59 Inspection - Inadequate Update of Containment Coatings Description in UFSAR and 3071-359 Design Specification	January 23, 2012
12-20812	NRC 2012 Mod/50.59 Inspection - SIL 643 Potential for H2 Detonation not Dispositioned in 50.59 Evaluation 10-0286 for OLNC	February 2, 2012
12-20624	NRC 2012 Mod/50.59 Inspection – DC-5373 Vol 1EDG's Neutral Grounding Resistor Calculation	January 25, 2012

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
07-23878	Concern Over Continuous Water Submergence of Underground Cables	July 12, 2007
07-26787	Signal Cables Supported by Ty-wraps are Routed Outside the Raceways	October 29, 2007
09-25940	Audit Finding: Design Basis Document R30-00 Does Not Discuss the Basis for Voltage and Frequency Requirements Established Technical Specification Section 3.8.1	July 31, 2009
07-21772	Spare MCC Bucket Incorrectly Labeled EQ Y by TSR-29429-012	March 29, 2007
11-22508	Incomplete Screen and 50.59 Evaluation	March 09, 2011
09-28785	Design Modification are Needed for the Cables Routed Outside the Raceways	November 12, 2009
09-25142	Undocumented Effect of a Fault in Non-Class 1E Circuit Powered from Class IE Power	July 02, 2009
10-26717	Procedure Enhancement for 23.321	August 04, 2010
01-14733	Potential RACTS Commitment Non-Compliance	May 5, 2001

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
02-12570	SIL 643 Potential for Radiological Gas Detonation	June 18, 2002

DRAWINGS

Number	Description or Title	Date or Revision
51721/2600-03	One Line Diagram Reactor Bldg., 120 VAC Distribution, Division I & II- Local Panels	0

MODIFICATIONS (EDP/ TSR)

Number	Description or Title	Date or Revision
34985	Change EQ Classification from "Y" to "N" for PIS-SU R1600S003D-49	December 02, 2009
36486	Clarification for Verification of DC-6309	April 21, 2010
35795	Ultra Low Sulfur Diesel Fuel Oil Acceptability for Continued use in the EDG, DFP, CTGs and Starting Diesels, EOF Diesel, and Aux Boiler	October 13, 2011
36326	TSR- ABN is Being Generated to Document the Non-Conforming Effect of Connecting Non-Class 1E BOP circuit to Class 1E power source	February 17, 2011
35477	Torus Water Level Setpoint Change for HPCI Suction Swap	0
3642	On-Line Noble Chemistry Injection Skid Implementation Related Plant Changes	A
36014	Replace Degraded Voltage Undervoltage Relays for 4160 Essential Buses	0
36796	Revision of MOV Stroke Times in DC-6348 QA1 MOV Thermal Overload Heater Sizing	0

PROCEDURES

Number	Description or Title	Date or Revision
23.308.01	Uninterruptible Power Supply System	36
23.321	Engineered Safety Auxiliary Electrical Distribution System	49
34.307.001	Emergency Diesel Generators- Inspection and Preventive Maintenance	72
23.425.01	Drywell Closeout	67

REFERENCES

Number	Description or Title	Date or Revision
GE-NE-0000-0007-4008-01	BWROG Hydrogen Accumulation Committee BWR Piping and Component Susceptibility to Hydrogen Detonation	0
GEH-OLNC-0000-0099-7942-02-R0	On-Line NobleChem™ (OLNC) Application Technical Safety Evaluation For Fermi Unit 2	0 and 2

REFERENCES

Number	Description or Title	Date or Revision
SIL 643	Potential for Radiolytic Gas Detonation	June 12, 2002

WORK ORDERS(WOs)

Number	Description or Title	Date or Revision
32963066	EDG Control Panel Neutral Grounding Resistor Inspection Followup	November 2, 2012
33392120		

MISCELLANEOUS/LICENSING CHANGE REQUESTS

Number	Description or Title	Date or Revision
LCR 10-015	Delete TRSR 3.8.3.1 from TRM	March 12, 2010
TE-N22-09-042	Extended Use of Free- Air Cables installed per TSR-27016	June 19, 2009
TSR-34985	Change EQ Classification “Y” to “N” for PIS-SU R1600S003D-49	December 04, 2009
TSR-36410	Incorporation of DC-0548 into DC-6309	February 15, 2010
09-028-TSB	Change required in response to design changes associated with TSR-36108	A
98-013-UFS	EDP 29637 replaces Min-K insulation with NUKON insulation	0
10-008-UFS	Increased thermal performance required of RHR heat exchanger to address GE SC06-01	0

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ATTN	Attention
BOP	Balance of Plant
BWR	Boiling Water Reactor
CARD	Condition Assessment Resolution Document
CCDP	Conditional Core Damage Probability
CFR	Code of Federal Regulations
DRP	Division of Reactor Project
DRS	Division of Reactor Safety
EC	Engineering Change
EDG	Emergency Diesel Generator
IGSCC	Intergranular Stress Corrosion Cracking
IMC	Inspection Manual Chapter
IN	Information Notice
IP	Inspection Procedure
IR	Inspection Report
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NGR	Neutral Grounding Resistor
NRC	U.S. Nuclear Regulatory Commission
NSR	Non-Safety-Related
NUREG	NRC Technical Report Designation
OLNC	On-Line NobleChem™
OOS	Out-of-Service
OPR	Operability Recommendation
PARS	Public Available Records System
RF	Reactor Feedwater
SP	Surveillance Procedure
TS	Technical Specification
TSC	Technical Support Center
USAR	Updated Safety Analysis Report
WO	Work Order
WTR	Water

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Hironori Peterson, Acting Chief
Engineering Branch 3
Division of Reactor Safety

Docket Nos.: 50-341
License Nos.: NPF-43

Enclosure: Inspection Report 05000341/2012007(DRS)
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ™

DISTRIBUTION:
Breeda Reilly
RidsNrrDorlLpl3-1 Resource
RidsNrrPMFermi2 Resource
RidsNrrDirsIrib Resource
Charles Casto
Cynthia Pederson
Jennifer Uhle
Steven Orth
Jared Heck
Allan Barker
Carole Ariano
Linda Linn
DRPIII
DRSIII
Patricia Buckley
Tammy Tomczak
ROPreports.Resource@nrc.gov

DOCUMENT NAME: G:\DRSIII\DRS\Work in Progress\-Fermi 2012 MOD 50 59 AKD.docx
□ Publicly Available □ Non-Publicly Available □ Sensitive □ Non-Sensitive
To receive a copy of this document, indicate in the concurrence box "C" = Copy without attach/encl "E" = Copy with attach/encl "N" = No copy

OFFICE	RIII	E	RIII		RIII					
NAME	ADahbur:ls		SOrth		HPeterson					
DATE	02/23/12		02/23/12		03/06/12					

OFFICIAL RECORD COPY