



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION III
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LISLE, IL 60532-4352

February 24, 2017

EA-17-012

Mr. Paul Fessler, Senior VP
and Chief Nuclear Officer
DTE Energy Company
Fermi 2 - 210 NOC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: FERMI POWER PLANT, UNIT 2 – NRC INSPECTION REPORT
05000341/2017009 AND PRELIMINARY WHITE FINDING

Dear Mr. Fessler:

On January 25, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Fermi Power Plant, Unit 2, and the NRC inspectors discussed the results of this inspection with Mr. K. Polson and other members of your staff. The results of this inspection are documented in the enclosed report.

Section 2RS6 of the enclosed report documents a finding with an associated apparent violation that the NRC has preliminarily determined to be White, with low-to-moderate safety significance. This finding involved the licensee's failure to maintain the effectiveness of the Fermi 2 Emergency Plan and use adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency. Specifically, due to the configuration of the site's standby gas treatment system accident range radiation monitor, the licensee failed to maintain the ability to accurately assess the condition of the plant and offsite radiological consequences, to accurately declare an Emergency Action Level classification, and to develop and issue accurate protective action recommendations (PARs) for the public during the implementation of the site's Emergency Plan in response to a rapidly progressing accident. We assessed the significance of the finding using the significance determination process (SDP) and readily available information. We are considering escalated enforcement for the apparent violation consistent with our Enforcement Policy, which can be found at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. Because we have not made a final determination, no notice of violation is being issued at this time. Please be aware that further NRC review may prompt us to modify the number and characterization of the apparent violation(s).

We intend to issue our final significance determination and enforcement decision, in writing, within 90 days from the date of this letter. The NRC's SDP is designed to encourage an open dialogue between your staff and the NRC; however, neither the dialogue nor the written information you provide should affect the timeliness of our final determination.

Before we make a final decision, you may choose to communicate your position on the facts and assumptions used to arrive at the finding and assess its significance by either: (1) attending and presenting at a regulatory conference, or (2) submitting your position in writing. The focus of a regulatory conference is to discuss the significance of the finding. Written responses should reference the inspection report number and enforcement action number associated with this letter in the subject line. Your written response should be sent to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Center, Washington, DC, 20555-001, with a copy to Mr. Steven K. Orth, Plant Support Branch, Branch Chief, U.S. Nuclear Regulatory Commission, Region III, 2443 Warrenville Road, Lisle, IL 60532.

If you request a regulatory conference, it should be held within 40 days of your receipt of this letter. Please provide information you would like us to consider or discuss with you at least 10 days prior to any scheduled conference. If you choose to attend a regulatory conference, it will be open for public observation. If you decide to submit only a written response, it should be sent to the NRC within 40 days of your receipt of this letter. If you choose not to request a regulatory conference or to submit a written response, you will not be allowed to appeal the NRC's final significance determination.

Please contact Mr. Steven K. Orth at (630) 829-9757, and in writing, within 7 days from the issue date of this letter to notify the NRC of your intentions. If we have not heard from you within 7 days, we will continue with our significance determination and enforcement decision.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding" Electronic Reading Room).

Sincerely,

/RA/

Kenneth G. O'Brien, Director
Division of Reactor Safety

Docket No. 50-341
License No. NPF-43

Enclosure:
Inspection Report 05000341/2017009

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-341
License No: NPF-43

Report No: 05000341/2017009

Licensee: DTE Energy Company

Facility: Fermi Power Plant, Unit 2

Location: Newport, MI

Dates: September 30, 2016, through January 25, 2017

Inspectors: V. Myers, Senior Health Physics Inspector
G. Hansen, Senior Emergency Preparedness Inspector

Approved by: S. Orth, Chief
Plant Support Branch
Division of Reactor Safety

Enclosure

SUMMARY

Inspection Report 05000341/2017009; Fermi Power Plant, Unit 2; Radioactive Gaseous and Liquid Effluent Treatment.

The enclosed inspection report documents a finding that has preliminarily been determined to be White, a finding with low to moderate safety significance, that may require additional U.S. Nuclear Regulatory Commission (NRC) inspections, regulatory actions, and oversight. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," dated July 2016.

NRC-Identified and Self-Revealed Findings

Cornerstone: Emergency Preparedness

Preliminary White. An NRC identified finding preliminarily determined to be of low to moderate safety significance (White), and an associated apparent violation of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(q)(2) and 10 CFR 50.47(b)(9) was identified for the licensee's failure to maintain the effectiveness of its emergency plan and use adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency. Specifically, the licensee failed to maintain the ability to accurately declare an Emergency Action Level (EAL) classification, RG-1.1, and develop and issue accurate protective action recommendations (PARs) during the implementation of the site's Emergency Plan in response to a rapidly progressing accident. The licensee inaccurately analyzed the effect of increasing background radiation on the site's Standby Gas Treatment System accident range radiation monitor (AXM) indications based on the installed configuration of the AXM. As configured, the AXM could provide inaccurate indications of radioactive releases that are used as the licensee's basis for determining EAL classification and development of PARs.

The licensee documented the issue in the corrective action program as CR-16-29230, and actions were completed to restore the accuracy of the indications provided by the AXM.

The inspectors determined that the licensee's failure to maintain the effectiveness of its emergency plan and use adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency was a performance deficiency; the cause was reasonably within the licensee's ability to foresee and correct; and should have been prevented. The inspectors determined the issue was more than minor because it adversely affected the emergency preparedness cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the finding would result in the potential over classification of an emergency event and the potential issuance of unnecessary or early PARs.

The inspectors applied Inspection Manual Chapter (IMC) 0609, Appendix B, Section 5.9. to screen this finding, and determined the licensee failed to maintain the risk significant planning standard (RSPS) identified in 10 CFR 50.47(b)(9) by ensuring adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use. Using Table 5.9-1, the inspectors determined the site's dose assessment process was incapable of providing technically adequate estimates of radioactive material releases to the environment or projected offsite doses in some cases (specifically a rapidly progressing accident scenario). This significance example corresponds to a Degraded RSPS Function, which is a finding of low to moderate safety significance (White).

The inspectors determined no cross-cutting aspects were associated with the performance deficiency. (Section 2RS6.1)

Licensee Identified Findings

None

REPORT DETAILS

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

.1 Instrumentation and Equipment (02.05)

a. Inspection Scope

The inspectors assessed calibration and availability for select effluent monitors used for triggering emergency action levels or for determining protective action recommendations.

b. Findings

Failure to Maintain the Effectiveness of the Site's Emergency Plan.

Introduction

An U.S. Nuclear Regulatory Commission (NRC)-identified, preliminary White finding, associated with an Apparent Violation (AV) of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(q)(2), and 10 CFR 50.47(b)(9) was identified for the licensee's failure to maintain the effectiveness of its emergency plan and use adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency. Specifically, the licensee failed to maintain the ability to accurately declare an Emergency Action Level (EAL) for a General Emergency classification (RG-1.1) and to develop and issue accurate protective action recommendations (PARs) for the public during the implementation of the site's Emergency Plan in response to a rapidly progressing accident. The licensee inaccurately analyzed the effect of increasing background radiation on the site's Standby Gas Treatment System (SGTS) accident range radiation monitor (AXM) indications based on the installed configuration of the AXM. As configured, the AXM would provide inaccurate indications of radioactive releases that are used as the licensee's basis for determining EAL classification and development of PARs.

Description

During accident conditions, the licensee's plant exhaust systems will redirect exhaust through the SGTS, which includes filters designed to remove radioactive material prior to release offsite. The SGTS AXM noble gas monitor's function is to quantify offsite radioactive releases through the SGTS during accident conditions. This data is then used in accordance with the licensee's emergency plan to determine emergency classification levels and PARs, based on the site's EAL schemes and offsite dose assessment programs. The PARs are then reviewed by State and Local officials to determine what protective actions may be initiated.

During a walkdown of the facility and discussion with staff, inspectors identified that the licensee used a fixed background subtract function for the AXM, which is located in close proximity to the SGTS filters. Although the function of the AXM is to quantify radioactive effluent releases through the SGTS, the detector will also respond to radiation from other external sources in the vicinity of the detector. Radiation from these other external sources is known as background radiation and may need to be subtracted from the total radiation that the detector is sensing in order to determine what is actually being released through the SGTS. The use of a fixed background subtraction means that a predetermined value for background radiation is subtracted from the detector reading. In this case, that predetermined value was based on background radiation during normal operation. The inspectors questioned this method because of the close proximity of the SGTS filters to the AXM. During an accident, the filters would collect radioactive material, significantly increasing the general area background radiation in the vicinity of the AXM. Upon further investigation, the inspectors determined that this AXM model had an additional detector that was designed to detect fluctuating background radiation and subtract that real time value from the detector sampling the SGTS (fluctuating background subtract). This fluctuating background subtract detector was not in use at the time of the inspection and an investigation by the licensee indicated that it had not been in use since the plant started operation. A preliminary evaluation conducted by the licensee concluded that the background radiation from the filters could result in AXM readings 100 to 1000 times greater than what would actually be released from the SGTS during accident conditions. In response to this evaluation, on November 16, 2016, the licensee declared both AXMs (Division 1 and Division 2) inoperable. An independent evaluation by the inspectors also concluded that the radiation from the SGTS filters would be sufficient enough to compromise the licensee's ability to quantify radioactive releases during accident conditions. Specifically, this issue could lead the licensee to declare emergency classification levels based on the site's EAL schemes prior to the actual EAL initiating conditions being met and/or result in dose projections prompting the issuance of PARs without the actual conditions being present.

In response to the initial evaluation, the licensee performed a more detailed evaluation of the AXM. This evaluation determined that even with the fluctuating background subtract detector functioning, the background radiation levels could be high enough that the AXM would not provide accurate readings. This evaluation also determined that, in 1996, the licensee identified that although the Final Safety Analysis Report (FSAR) indicated that the AXM utilized a fluctuating background subtract function, this function was not in use at the time. The licensee failed to recognize the impact of the radiation fields in accident conditions. Instead, the licensee updated the FSAR to reflect that only fixed background subtract would be used with the justification that the AXM was in an area with relatively fixed radiation levels. Although radiation levels do remain relatively fixed during normal operations, the licensee failed to identify that during accident conditions, radiation levels would increase substantially.

Additionally, the inspectors reviewed and evaluated information provided by the licensee in which the licensee asserted they would be able to effectively implement the emergency plan. Specifically, the licensee would use indications from the site's containment high range radiation monitors (CHRRMS) to assess the potential off-site radioactive release and would be able to identify that the indications provided by the AXM were inaccurate. The site's implementing procedure EP-101, Classification of Emergencies, Revision 41, states, in part, the indications for declaring EAL RG 1.1 are "in the absence of real time dose assessment, reading on any Table R-1 effluent

radiation monitor greater than column "GE" for greater than or equal to 15 minutes." Included in Table R-1 Effluent Monitor Classification Thresholds are the readings for the SBGTS AXM. The CHRRMS are not credited for classifying the emergency condition under this EAL initiating condition. The inspectors evaluated the information provided by the licensee and concluded that, while the licensee would likely recognize the difference between the CHRRMS indications and the AXM indications, absent any real time dose assessment information, the site would likely rely on the AXM indications for declaration of EAL RG 1.1 and subsequent determination of PARs, as directed by its procedures. The time that it would take to determine the accuracy of the AXM readings would result in the failure to accurately declare the EAL classification and determine PARs.

Overall, the inspectors concluded that the licensee failed to maintain the effectiveness of its emergency plan and use adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency. Specifically, the licensee failed to maintain the ability to accurately declare an EAL classification RG-1.1, and develop and issue accurate PARs during the implementation of the site's Emergency Plan in response to a rapidly progressing accident.

Analysis

The inspectors determined that the licensee's failure to maintain the effectiveness of its emergency plan and use adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency was a performance deficiency; the cause of which was reasonably within the licensee's ability to foresee and correct, and should have been prevented. The inspectors determined the issue was more than minor because it adversely affected the EP cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the finding would result in the potential over classification of an emergency event and the potential issuance of unnecessary or early PARs.

The finding is associated with a Failure to Comply, in that, the site's EP program was non-compliant with the EP regulatory requirement of 10 CFR 50.47(b)(9). The inspectors screened the finding using IMC 0609, Appendix B, Section 5.9. Specifically, the licensee failed to maintain the risk significant planning standard (RSPS) identified in 10 CFR 50.47(b)(9) by ensuring adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use. Using Table 5.9-1, the inspectors determined the site's dose assessment process is incapable of providing technically adequate estimates of radioactive material releases to the environment or projected offsite doses in some cases (specifically a rapidly progressing accident scenario). This significance example corresponds to a Degraded RSPS Function (Preliminary White Finding).

The inspectors determined that the performance deficiency was not indicative of current plant performance and therefore, no cross-cutting aspect was assigned. The inspectors recognized that the licensee missed an opportunity to identify and correct the issue as part of the FSAR evaluation in 1996.

Enforcement

Title 10 CFR 50.54(q)(2) requires, in part, a licensee authorized to possess and operate a nuclear power reactor shall follow and maintain the effectiveness of an emergency plan which meets the requirements in Appendix E to this part and the planning standards of 10 CFR 50.47(b). Title 10 CFR 50.47(b)(9) requires, in part, adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

As of September 30, 2016, the licensee failed to maintain the effectiveness of its emergency plan and use adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency. Specifically, the licensee failed to maintain the ability to accurately declare an EAL classification RG-1.1, and develop and issue accurate PARs during the implementation of the site's Emergency Plan in response to a rapidly progressing accident. The licensee failed to analyze the effect of increasing background radiation on the site's SGTS AXM indications based on the installed configuration of the AXM. As configured, the AXM would provide inaccurate indications of radioactive releases that are used as the licensee's basis for determining EAL classification and development of PARs. This is an apparent violation of NRC requirements.

The licensee documented the issue in the corrective action program as CR-16-29230. Corrective actions for this issue included immediate actions to notify the Shift Manager, Emergency Response Organization personnel, and other appropriate plant staff on the status of the AXM and the use of alternate sampling capabilities. Additionally, the licensee has completed the installation of lead shielding around the AXM to ensure the accuracy of the AXM indications during accident conditions. **AV 05000341/2017009-01 (Failure to Maintain the Effectiveness of the Site's Emergency Plan).**

4. OTHER ACTIVITIES

4OA5 Other Activities

.1 (Closed) Unresolved Item 05000341/2016003-02: Fluctuating Background Effect on Accident Range Noble Gas Monitor

Introduction: The inspectors closed an unresolved item (URI), which was discussed in NRC inspection report 05000341/2016003, and was related to the licensee's ability, during an accident, to accurately quantify radioactive releases, potentially having an adverse impact on the licensee's ability to effectively implement its Emergency Plan. The inspectors determined that this issue represented a URI because more information was required to determine whether a performance deficiency existed associated with the licensee's ability to effectively implement the site's Emergency Plan during a rapidly progressing accident scenario based on the existing configuration and location of the SGTS AXM.

Description: During a walkdown of the facility and discussions with licensee staff, the inspectors identified that the SGTS AXM noble gas detector did not utilize the fluctuating background subtraction feature of the unit and only subtracted a fixed background rate. The inspectors questioned this configuration because the physical location of the monitor was in close proximity to the SGTS filtration system, which could significantly change radiation levels in the area during an accident. The function of the AXM is to

assess radioactivity being released from the plant during accident conditions. These readings are used for various purposes, including accident classification and off-site dose assessment, both of which can affect the protective action recommendations made by the licensee. On September 29, 2016, the licensee provided the inspectors an assessment of the potential impact of fluctuating background from the filtration system on the AXM noble gas detector. The licensee continued the assessment of the AXM configuration and the impact on the site's ability to effectively implement the Emergency Plan. On November 16, 2016, as documented in CR 16-23920, the licensee declared the AXM inoperable due to evidence the AXM could read radioactive releases approximately 1000 times greater than what is actually exiting the filter train and being released to the environment. This could lead to inaccurate EAL declarations and inaccurate dose assessments in an accident. Based on the additional information documented in CR-16-23290, the inspectors identified a potential finding and an apparent violation of regulatory requirements. Therefore, this URI is closed to the finding documented in section 2RS6.1 of this inspection report. **AV 05000341/ 2017009-01 (Failure to Maintain the Effectiveness of the Site's Emergency Plan).**

4OA6 Management Meetings

.1 Exit Meeting Summary

On January 25, 2017, the inspectors presented the inspection results to Mr. K. Polson, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

K. Polson, Site Vice President
M. Caragher, Plant Manager
E. Kokosky, Director-Organizational Effectiveness
S. Maglio, Licensing Manager
N. Avrakatos, Emergency Preparedness Manager
K. Mann, Compliance Supervisor
S. Ward, Senior Licensing Engineer
R. LaBurn, Radiation Protection Manager

U.S. Nuclear Regulatory Commission

B. Kemker, Senior Resident Inspector
P. Smagacz, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000341/2017009-01	AV	Failure to Maintain the Effectiveness of the Site's Emergency Plan (Section 2RS6.1)
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Closed

05000341/2016003-02	URI	Fluctuating Background Effect on Accident Range Noble Gas Monitor (Section 4OA5)
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Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a partial 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 or 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.

Section 1R15

- Radiological Emergency Response Preparedness Plan; Revision 46
- EP-101; Classification of Emergencies; Revision 41
- EP-542; Computer-Based Offsite Dose Assessment – Airborne Release; Revision 13
- EP-545; Protective Action Recommendations; Revision 26
- LOCA Exercise sample dose assessment worksheets; Dated January 20, 2017
- NPRP-16-0105; Effect of shine from SGTS filter train on AXM readings;
Dated September 28, 2016
- Procedure 78.000.67; Transfer Calibration of the Eberline AXM-1 Monitor;
Dated November 14, 1984
- Vendor Manual VMC1-151; Eberline AXM-1; Revision D
- CR 23995; NRC Question – RERP Noble Gas Accident Range Monitor response during design base accident; Dated May 16, 2016
- CR 28049; NRC unresolved issue: Evaluation of effect of SGTS filter shine on AXM monitor readings in DBA; Dated October 10, 2016
- CR 16-29230; AXM Radiation Monitors; Dated November 16, 2016

LIST OF ACRONYMS USED

AXM	Accident Range Monitor
CHRRMS	Containment High Range Radiation Monitors
CFR	<i>Code of Federal Regulations</i>
EAL	Emergency Action Level
EP	Emergency Preparedness
FSAR	Final Safety Analysis Report
IMC	Inspection Manual Chapter
IP	Inspection Procedure
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
PAR	Protective Action Recommendation
PI	Performance Indicator
RSPS	Risk Significant Planning Standard
SGTS	Standby Gas Treatment System
URI	Unresolved Item

P. Fessler

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Letter to Paul Fessler from Kenneth G. O'Brien dated February 24, 2017

SUBJECT: FERMI POWER PLANT, UNIT 2 – NRC INSPECTION REPORT
05000341/2017009 AND PRELIMINARY WHITE FINDING

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