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No. 3 5194 9:20 AM
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Tim,
A copy of our 10 CFR 21 notification
to the NRC operations center this morning.
-- Girija

PRC No. 94-01 (Rev. 1)

10 CFR 21 REPORTABILITY EVALUATIONEvaluation Result and Recommendation:

This potential reportable condition represents problems and discrepancies identified regarding installation of Thermo-lag fire barriers at Fermi 2 which were discovered during removal and replacement of these barriers in the on-going fourth refueling outage. Details of the discrepancies are provided in the attachment, however, they are generally related to the following conditions:

- 0 Interferences/heat transfer surfaces such as pipes, conduits, cable tray and pipe supports were not adequately protected with sufficient amount of Thermo-Lag material.
- 0 Panels were not installed correctly.
- 0 Cable tray wraps did not have enough protective material installed.

These identified improper installation conditions concern an activity or a basic component which is necessary to ensure the capability to shutdown the reactor and maintain it in a safe shutdown condition because these installations may not be capable of providing the required protection from fire to structures, systems, and components important to safety.

These installations appear to contain deviations and defects as defined in 10 CFR 21, because they resulted in a product that does not meet the requirements of the Detroit Edison procurement documents for providing qualified fire protection barriers at Fermi 2.

The defect of improper installation of Thermo-Lag fire barriers is such that it may not provide required fire protection to essential safety systems. This could result in a major degradation of these systems such that a required safety function may not be performed during or after a fire. Therefore, this defect could create a substantial safety hazard, as defined in 10 CFR 21.

Therefore, the condition of improper installation of discussed Thermo-Lag fire barriers at Fermi 2 is recommended as reportable under the requirements of 10 CFR 21.

Written by: G. S. Shukla

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PDR FOIA
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(Attachment to PRC No. 94-01, Rev. 1)

IMPROPER INSTALLATION OF THERMO-LAG FIRE BARRIERS

During removal and replacement of the Thermo-Lag fire barriers at Fermi 2 the following installation discrepancies were observed by the Fermi 2 Fire Protection Engineer.

1) Generic Problems:

- Interferences/heat transfer surfaces such as insulated pipe, conduits, cable tray, and pipe supports were not encased or coated with sufficient amount of trowel grade Thermo-Lag material.
- Panels were not always installed uniformly (e. g. with the ribs facing out), as required.

2) Relay Room Stairwell (El. 613'-6"):

Where the cable tray wrap system terminated at the two existing silicone foam seals, the Thermo-Lag material stopped at the outer edge of the foam providing no protection for the cables imbedded in the foam seal, below the Thermo-Lag seal, once an inch of foam was burned away (foam burns away at 3 inches per hour).

3) Cable Tray Vault (El. 677'-6"):

- The expanded metal which is required to achieve the 3 hour fire rating for a wall type assembly was completely omitted.
- Panels were used to support each other in lieu of support steel. In one instance a panel cantilevered out four feet to a second panel cantilevered down about three feet forming a right angle.

4) CCHVAC Area (El. 677'-6"):

- Panels were simply sitting on the floor without actually being fastened to the floor, as required.
- Outside the control room ventilation duct work, adjacent to fire dampers the duct work, support steel was installed around the dampers without the vendor specified clearance. The effect of this installation on the dampers is being evaluated at this time. These dampers serve solely a fire barrier function and the observed condition has no effect on the operability of the control room ventilation system.

(2)

Detroit Edison is further investigating this issue with the contractor performing removal and replacement of Thermo-Lag material to obtain written confirmation of potential additional discrepancies.

Thermal Science, Inc. (TSI) furnished and delivered the Thermo-Lag trowel grade and pre-fabricated panel material. TSI also furnished technical assistance to develop a procedure to support the installation requirements as defined in Detroit Edison's specifications with Detroit Edison's site contractor responsible for the installation of the material. TSI provided field service engineer for on-site technical assistance and provided site visits to investigate interferences and to recommend installation process. TSI also trained and certified the crew of the site contractor responsible for installation and inspection of the material at Fermi 2. The installation was required to be performed by personnel certified by TSI.

Installation of the Thermo-Lag material at Fermi 2 and first line supervision of the installation was performed by the P. R. Sussman Company of Toledo, Ohio per the contract. The P. R. Sussman Company also furnished verification records showing acceptance of the Thermo-Lag installation at Fermi 2. In addition, TSI issued a letter to P. R. Sussman Company stating that the installation of the Thermo-Lag material at Fermi 2 was completed according to TSI's published application guide and generic test report.

It is not known to Detroit Edison whether the P. R. Sussman Company performed installation of Thermo-Lag material at any other nuclear power plant.

Written by: R. J. Kilroy

Daily News Digest

The Monroe Evening News

July 12, 1984

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Fire retardant at Fermi installed improperly

■ Indications are that a fire-resistant material called 'Thermo-Lag' may have posed a fire threat because of improper installation. The finding may have implications for other U.S. nuclear plants.

By CHARLES SLAT
Evening News staff writer

Detroit Edison Co. has discovered that a controversial fire retardant at its Fermi nuclear plant was installed improperly and could have interfered with some safety systems. It's a finding that could affect dozens of other utilities.

While ripping out the substance called "Thermo-Lag" at Fermi, the company found spots where it was far thinner than required and other areas where it was supported by wooden blocks. It also found it was installed in a way that would have kept open some ductwork dampers that are meant to close and protect the plant control room from smoke and fire.

The utility still is investigating the way the material was installed and hopes to make its findings known to federal officials within 30 days, according to Lewis K. Layton, an Edison spokesman.

Thermo-Lag, a concrete-like panel material used widely as protection for safety-related electrical cables in the nation's nuclear plants, was determined by the federal Nuclear Regulatory Commission (NRC) to be less effective as a fire barrier than first thought after it had been installed in dozens of nuclear plants.

When questions about its effectiveness surfaced, the NRC ordered plants to take compensatory measures — such as roving fire-watch brigades and closed-circuit cameras — to reduce the threat of fire in protected areas.

While Fermi is idled to repair damage from a December turbine-generator acci-

dent, Edison decided to voluntarily strip the plant of the material and replace it with other fire-resistant material. It expects to spend about \$325,000 to remove Thermo-Lag from 1' areas where it was installed when the plant was built.

"As they removed the Thermo-Lag material, they found instances where it was not properly installed," said Jan Strasma, an NRC spokesman. "We're looking into it now as far as the generic implications."

As many as 60 nuclear plants around the United States use Thermo-Lag as a fire barrier. The findings at Fermi may lead to an NRC demand that it be removed from all nuclear plants.

"Essentially, what's at issue here at Fermi was that this material was misinstalled and has been misinstalled since the start of the plant," said Paul Gunter, director of the Reactor Watchdog Project for the Nuclear Information and Resource Service in Washington, D.C. "There is no confidence that the material is properly installed at other plants around the country."

Indications that combustible material, such as wooden blocks, were incorporated into the installation at Fermi suggest that the material would have been more susceptible to fire than first thought, Mr. Gunter said.

It appears that the potential for Thermo-Lag to hamper the protective dampers at Fermi has existed since the plant started operation in 1982, he said.

"It meant that the plant was very, very vulnerable to fire from the start," said Michael Keegan of Monroe, a member of an anti-nuclear citizens group.

Mr. Strasma said the findings at Fermi will be reviewed by the NRC to see if other plants need to be warned of the potential for improper installation at their plants.

Fermi decided to strip the material because it only was used in 11 areas of the plant. But other plants around the U.S. have made far greater use of the material, raising the prospect that mandatory removal would be an expensive proposition for the industry.

Meanwhile, a Baltimore grand jury investigation into the making and marketing of Thermo-Lag is continuing. A principal in a laboratory that testified to the effectiveness of the material already has pleaded guilty to aiding and abetting fraudulent marketing of the product.

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Detroit
Edison

Douglas R. Gipson
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February 11, 1994
NRC-94-0011

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 Generic Letter 92-08, "Thermo-Lag 330-1 Fire Barriers", dated December 17, 1992
 - 3) Detroit Edison Letter to NRC, "Detroit Edison Response to NRC Generic Letter 92-08," NRC-93-0043, dated April 8, 1993
 - 4) NRC Letter to Detroit Edison, "Request for Additional Information Regarding Generic Letter 92-08, Thermo-Lag 330-1 Fire Barriers," dated December 22, 1993

Subject: Detroit Edison Response to NRC Request for Additional Information Regarding Generic Letter 92-08

The purpose of this letter is to provide Detroit Edison's response to NRC Request for Additional Information (RAI) regarding Generic Letter 92-08 (Reference 4) which was issued to obtain additional information regarding resolution of the Thermo-Lag issues. As requested, a copy is also being submitted to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region III.

Detroit Edison provided a response to Generic Letter 92-08 via Reference 3 which stated, in part, that Detroit Edison is monitoring industry activities to restore fire barrier integrity through programs coordinated by NUMARC. The response further stated that Detroit Edison would apply the results of these programs, if applicable, to the Thermo-Lag installation at Fermi 2.

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Subsequent to the submittal of the response to Generic Letter 92-08, Detroit Edison opted not to wait for the results of the industry programs coordinated by NUMARC and decided to resolve Thermo-Lag issues by either removal or reclassification of Thermo-Lag fire barriers at Fermi 2.

As stated in the response to Generic Letter 92-08, eleven areas were identified where Thermo-Lag fire barriers having a 3-hour rating are installed at Fermi 2. In the following eight of these eleven areas, Thermo-Lag fire barriers are being removed and replaced by concrete blocks and qualified 3-hour rated fire barriers such as 3M barriers, UL designs U435 and X719, promat boards, silicone foam and elastomer seals:

1. Cable Tray Enclosure for Cable Trays 1C-037 and 1P-070, CCHVAC Area, El. 677'-6"

Two (2) cable trays 1C-037, and 1P-070 are routed between the Division 1 CCHVAC Equipment Area and the Ventilation Equipment Area both on El. 677'-6", and have been enclosed by an envelope of Thermo-Lag material. The purpose of this structure was to provide a three hour rated barrier to enclose and protect these trays as they traverse the Division II CCHVAC area. This enclosure is being replaced with an approved three hour fire rated assembly.

2. Separation Barrier Between the Redundant CCHVAC Air Handling Units in the CCHVAC Area on El. 677'-6"

Due to the close proximity of the divisionalized CCHVAC equipment in the CCHVAC area on El. 677'-6", a three hour rated fire barrier was constructed of Thermo-Lag material to separate this equipment. This barrier is being replaced with an approved three hour fire rated assembly.

3. Electrical Blockout Closure in the Cable Tray Area on El. 631'-0"

Thermo-Lag material was used to seal the electrical blockout opening between this area and the cable tunnel on elevation 613'-6". The purpose of this barrier was to provide a three hour fire rated seal in a floor opening. This penetration seal is being replaced with an approved three hour fire rated barrier.

4. Electrical Blockout Closure in the Cable Spreading Room on El. 630'-6'

Thermo-Lag material was used to seal the electrical blockout opening between this area and the Cable Tunnel on elevation 613'-6" and into the barrier separating the two (2) halves of the Cable Tunnel. The purpose of this barrier was to provide a three

hour fire rated seal in a floor opening. This penetration seal is being replaced with an approved three hour fire rated barrier.

5. Cable Tray Enclosure for Cable Tray 1K-034 in the Relay Room Stairwell Enclosure Between El. 613'-6" and 643'-6"

A three hour rated fire barrier of Thermo-Lag material was constructed around cable tray 1K-034 to provide the required separation from cable tray 2K-030 both of which are located in the relay room stairwell. This barrier is being replaced with an approved three hour rated fire barrier.

6. Ventilation Equipment Area Wall, Elevation 659'-6"

The west wall of the ventilation equipment area on elevation 659'-6" contains a large Thermo-Lag material wall section/seal between columns 9 and 10. This seal was installed above and around four (4) HVAC ducts and some support steel where the ducts travel through this wall and into a large pipe/HVAC chase to maintain the three hour fire rating of the wall. This Thermo-Lag seal is being replaced with an approved three hour fire rated assembly.

7. CCHVAC Equipment Area Wall Sections Elevation 677'-6"

The concrete block wall enclosing the small HVAC room in the CCHVAC area on the fifth floor contains three (3) openings and some adjacent support steel which were sealed with Thermo-Lag to maintain the fire rating of the wall. These Thermo-Lag seals are being replaced with approved fire rated assemblies.

8. Cable Tray Enclosure for Trays 1C-078 and 1P-073 Elevation 667'-6"

Two (2) cable trays (1C-078 and 1P-073) are routed between the Division I CCHVAC equipment area and the SBGTS rooms have been enclosed by a envelope of Thermo-Lag. The purpose of this structure was to provide a three hour rated fire barrier to enclose these trays as they traverse the Division II CCHVAC area. The two trays were originally considered to be required for safe shutdown but subsequent reanalysis determined that the cables in trays 1C-078 and 1P-073 are not required for safe shutdown. Hence, the cable enclosure is no longer required and is being removed.

The openings exposed by the removal of Thermo-Lag cable vault in the Division I CCHVAC enclosure wall and in the wall into the SBGTS area are being filled with UL listed three hour rated and air tight seals using approved materials to restore those barriers to their original design configuration.

In the remaining three areas it was determined that the requirements of Appendix R to 10CFR50 could be met without these Thermo-Lag installations. Hence, the following three barriers are being reclassified as smoke and gas barriers and, thus, are not being removed or replaced:

9. HVAC Chase Floor Closure, Elevation 613'-6"

The HVAC chase at column H-10 extends from elevation 613'-6" to elevation 677'-6" and is completely devoid of combustible material for its 64 foot vertical length. The walls of this chase are constructed and sealed as 3 hour rated barriers. The floor of this chase was constructed of Thermo-Lag material and was intended to be a 3 hour rated barrier.

Automatic fire detection is provided at both the 613'-6" and 677'-6" floor openings of this chase. The mezzanine area on elevation 603'-6" is also provided with an automatic wet pipe sprinkler system plus additional sprinkler coverage for selected cable trays on the mezzanine. Manual fire suppression capability is provided at each end of this chase.

UFSAR Section 9A.4.2.3 states that the combustible loading below the chase translates to a fire duration of less than one hour, however, the presence of the wet pipe sprinklers and automatic detectors will ensure any fire occurring in the vicinity of the chase opening will be quickly detected and extinguished. Therefore, any postulated fire on elevation 603'-6" will not be of sufficient intensity or duration to propagate up a 64 foot high HVAC chase. As documented in UFSAR Section 9A.4.2.16 the combustible loading at elevation 677'-6" translates to a fire duration of less than two minutes. Also, there are no combustible materials in the HVAC chase.

Therefore, based on the above discussion, flame propagation between elevations 603'-6" and 677'-6" via the 64 foot high HVAC chase at column F-10 is not a credible event regardless of the presence of the Thermo-Lag barrier. Hence, this barrier is being reclassified as a continuous non-fire rated smoke and gas barrier as defined in NFPA 101.

10. HVAC Chase Floor Closure, Elevation 630'-6"

A second HVAC chase at column F-13 extends from elevation 630'-6", directly above the southwest corner of the Relay Room, to the Control Room ceiling at elevation 654'-0"; and is completely devoid of combustibles for its approximate 23 foot length. The HVAC ducts entering this chase at and on elevation 630'-6" are provided with fire dampers. The walls and the

ceiling around the HVAC ducts exiting the chase on elevation 654'-6" are 3 hour rated barriers. However, the metal HVAC ducts exiting the chase at elevation 654'-0" are not provided with fire dampers. Two pieces of Thermo-Lag material were used to seal the floor of this chase as a 3 hour rated barrier.

Automatic fire detection is provided at both the 630'-6" and 654'-0" elevation of this chase. The Relay Room is also provided with an automatic halon suppression system. Manual fire suppression capability is provided in both the Relay and Control rooms. Additionally, the Control Room is continually staffed by personnel trained in fire suppression.

UFSAR Section 9A.4.2.4 states that the combustible loading in the Relay Room translates to a 1 hour fire duration, however, the presence of the automatic detection and halon suppression system will ensure that any postulated fire in this room will be quickly detected and extinguished. The area above the Control Room ceiling is practically devoid of combustibles in the vicinity of this chase. Therefore, any postulated fire in the Relay Room will not be of sufficient intensity or duration to breach the two small Thermo-Lag floor panels and then travel up a approximate 23 foot high chase which itself is devoid of combustibles, breach the metal ductwork above this chase, and spread into the Control Room suspended ceiling area. The fire would have to breach the metal ductwork twice, once just to get into the ductwork itself, and again to break out into the 654'-0" elevation. Also, NFPA 90A gives HVAC ductwork in walls equal to a one hour fire resistance rating.

Therefore, based on the above discussion, flame propagation between the Relay Room and the Control Room via the HVAC chase and two breaches of the metal ductwork at column F-10 is not a credible event. Hence, the Thermo-Lag barrier is being reclassified as a non-fire rated continuous smoke and gas barrier as defined in NFPA 101 used to maintain the halon concentration in the Relay Room by preventing it from spreading into the chase.

11. Relay Room Stairwell Enclosure in the Northeast Corner of the Relay Room on El. 613'-6"

A three hour rated fire barrier was constructed of Thermo-Lag material to separate the Relay Room from the Control Center northwest stairwell at elevation 613'-6". This barrier is being reclassified as a continuous smoke and gas barrier as defined by NFPA 101, and is no longer considered as a fire barrier. The remaining stairwell walls become the three hour rated fire barrier separating the Relay Room from the Cable Spreading and Control Rooms. To support this change the following upgrades are

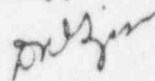
being performed to the existing stairwell walls and ceiling, converting them to three hour rated fire barriers.

- o The doors leading into the Cable Spreading Room (RM2-4) on elevation 630'-6" and the Control Room (R3-20) on elevation 643'-6" from the stairwell are being replaced with three hour rated doors.
- o The underside ceiling of the stairwell will be coated with a 3 hour fire rated cementitious mixture fire barrier.

The justification for these reclassifications is being included in the Fermi 2 Fire Hazards Analysis (UFSAR Appendix 9A). All efforts to replace or reclassify Thermo-Lag fire barriers at Fermi 2 are being planned for the current outage and are expected to be completed by Fall, 1994. Documentation attesting qualifications of replacements and reclassifications are available at Fermi 2 for review and inspection.

If you have any questions, please contact Mr. Girija S. Shukla at (313) 586-4270.

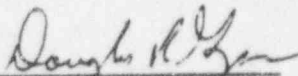
Sincerely,



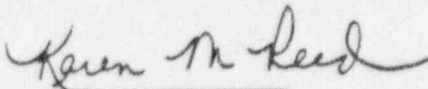
cc: T. G. Colburn
J. B. Martin
M. P. Phillips
W. J. Kropp

USNRC
February 11, 1994
NRC-94-0011
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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 11th day of February, 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.


Notary Public

KAREN M. REED
NOTARY PUBLIC - MONROE COUNTY, MICH.
MY COMMISSION EXPIRES 4-27-94