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May 11, 1984
EF2-68541

Mr. James G. Keppler
Regional Administrator
Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

Reference: (1) Fermi 2
NRC Docket No. 50-341
(2) Detroit Edison Letter (EF2-65288) to NRC
Dated October 20, 1984
(3) Detroit Edison Letter (EF2-66490) to NRC
Dated December 22, 1983

Subject: Interim Report of 10CFR50.55(e) Item #101
Debris in Piping Systems

On September 20, 1983 Detroit Edison's Mr. W. R. Wingfield, Quality Engineer-Construction Quality Assurance, telephoned Mr. H. M. Wescott of NRC Region III to identify problems related to RHR Pump "B". This was subsequently confirmed by letter on October 20, 1983. This letter (Reference 2) listed various items of debris in piping along with mechanical problems with the RHR pumps. On December 22, 1983 (Reference 3) Edison advised the NRC Region III that Project Quality Assurance was going to separate the mechanical problems (i.e., linear indications on the RHR pump impellers) from the debris in piping item. The mechanical problems were assigned 10CFR50.55(e) Item Number 107 and the debris in piping problem was assembled under 10CFR50.55(e) Item Number 101. This letter provides an updated report on the debris in piping item.

Description of Deficiency

During the preoperational testing phase, construction debris was found within safety-related piping systems contrary to approved Detroit Edison cleanliness requirements.

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Analysis of the Safety Implications

Debris remaining in safety related piping systems could result in the affected system not performing its intended function, thus possibly degrading those functions in an indeterminate manner. Safety analyses are performed on a case-by-case basis as debris is identified. Results of all safety analyses for specific debris found will be presented in the Final Report on this item.

Corrective Action

In order to provide a comprehensive response to the subject deficiency, the discussion of corrective action is presented as described below.

1. The initial discussion addresses the specific debris identified to date. The inspections and safety analyses initiated to scope the extent of the problem and assess its impact on safety are also identified.

2. In addressing the concern on a generic system basis, the Fermi 2 programs in place to purge debris are described. This discussion is provided to indicate the comprehensive nature of the Fermi 2 approach to cleanliness.

3. In addition, a description of the revisions made to Fermi 2 inspection and maintenance procedures that will more positively control materials and personnel access to open systems is provided. A discussion of the safety reviews which are initiated as a result of identified debris is also included.

It is the Edison position that subsequent to completion of these programs, the operation of safety-related systems will not be impaired due to debris in piping.

Actions taken specific to debris found:

Reference 2 provided a description of the immediate corrective actions initiated after identification of the debris (i.e., set screw and plywood) in the RHR line. In addition, subsequent investigations were performed on related portions of the affected system to ensure cleanliness. Similarly, as a result of subsequent incidents involving debris in safety-related piping systems, follow-up inspections were conducted as follows:

1) adjacent to... the location where debris was found;
2) at piping orientations... within the affected system where debris may be expected to lodge or come to rest (e.g., dead legs, orifices).

The final report to this 50.55(e) will more specifically delineate the debris that was found, the nature of that debris, and the areas of safety related systems that were inspected to insure they were free of debris.

Upon identification of debris, Edison initiated a safety review to assess the potential safety impact of the debris. General Electric has provided support in this task. As a result of reviews performed, GE has recommended additional locations within the affected piping systems where further inspections may be required. Edison has/will address these recommendations on a case-by-case basis considering what has been inspected to date. The final report to this 50.55(e) will provide the results of the following: GE and Edison safety reviews recommendations; the initial and followup inspections; and final justification to support Edison's conclusion that the existing systems are free of significant debris.

Programs to Ensure Cleanliness:

Detroit Edison has several programs in place which have been developed and implemented to minimize the probability of debris being left in piping. The two primary programs that serve to ensure system cleanliness are the flushing program (virtually complete) and the preoperational test program (on-going). Both programs are briefly discussed below.

- Flushing Program - The purpose of the flushing program was to adequately ensure that closed systems were properly purged of foreign material. In order to properly flush these systems, Fermi 2 utilized a temporary system which provided flushing paths for systems that could not normally be flushed during the construction phase. This temporary flushing system allowed systems to be flushed at flow rates meeting or exceeding their normal design rates.

All systems connected to the reactor vessel were initially back flushed. Those systems with discharge lines connected to the reactor vessel were then flushed with the temporary flushing system, when available, and the system pumps, when available. In addition, all Class B lines were only accepted as clean after both a chemistry analysis and timed flushes through flush cloths were acceptably performed.

A review of the flushing program indicates that the program either removed the debris from the system or moved it to a location or orientation that would preclude its removal under subsequent system operation or additional flushing.

Once a system had been flushed, all subsequent construction was to be performed to the same cleanliness class as the original flush. This requirement was identified on the work documents and compliance confirmed via signature of appropriate individuals on the work document.

- Preoperational Test Program - Subsequent to system flushing, the systems were or will be operated in accordance with the preoperational test program. This program is performed to verify design flow rates, pressure drops, leakage rates, and ensure proper overall operation of the system. For these tests various operating parameters are monitored and recorded. Any discrepancies indicating less than acceptable system performance will be documented and addressed. (For example, if a flow obstruction is preventing the system from achieving its required flow, it will be identified, documented and resolved.)

Additional Action to Prevent Recurrence:

As indicated previously, Edison has also reviewed and revised, where necessary, many of its maintenance, testing and inspection procedures to enhance both the material inventory control procedures and the opening and closing cleanliness practices used in the vicinity of open systems. The revisions encompass all intrusions into QA Level I, II and III systems by construction and into safety-related systems by maintenance personnel. The following examples are provided to indicate how Edison procedures have been revised.

- Additional training of plant personnel to increase their awareness of the importance of system cleanliness.

- Administrative Procedure 12.000.48 was revised to require an independent verification for cleanliness of safety-related systems, when systems are initially opened and prior to their closure.

- Project Procedure 7.27, Rev. 1, and Procedure 12.000.48 identify more comprehensive housekeeping criteria for work in defined cleanliness zones (e.g., minimize traffic in proximity with an open system; inspect clothes and tools for loose articles and parts, respectively; assign a responsible craft person or security to oversee work while system is open and secure closed when not present).

  NOTE: This item is more specifically discussed in Edison's response to Inspection Report No. 50-341/83-28.

- SCO Procedure 13.1, Rev. Ø requires a daily walkdown to ensure: Cleanliness is maintained; spare and disassembled components are properly tagged and segregated; open ended pipes, conduits and tubing are properly protected; and that all deficiencies are identified and promptly addressed.

The preceding discussion has focused on programs and procedures in place to prevent debris from being introduced into or remaining in a safety related system. If debris is found upon opening a safety-related system, Procedure 12.000.48 requires Edison Engineering to be notified. Engineering will:

1. ensure the debris is documented,

2. conduct or authorize the conduct of a safety analysis to determine the safety implications of the debris,

3. determine the need for supplemental inspections on the same and other systems (supplemental inspections can be performed in a number of ways, such as direct visual inspection, inspections using boroscopes, cameras, X-rays, and personnel crawling through piping if it is reasonable to do so),

4. document resolution.

The procedure (12.000.48) described above was used in assessing safety impact of debris addressed in this report.

Edison feels that the programs in place at Fermi 2 provide adequate assurance that the systems in their final configuration will be free from debris that could impair their proper operation.

The final report on this 50.55(e) will provide specific results for the reviews identified as ongoing in this submittal. If you have any questions concerning this matter, please contact Mr. Lewis P. Bregni, (313) 586-5083.

Sincerely,

Wayne H. Jens

cc: P. M. Byron
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