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October 10, 1984
EF2-69700

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) Letter, W. H. Jens to J. G. Keppler,
May 24, 1984, EF2-68547

Subject: Final Report of 10CFR50.55(e) Item 124
"Lamination in ASTM-A516 Grade 70 Steel Plate"

This is Detroit Edison's final report of Item 124, "Lamination in ASTM-A516 Grade 70 Steel Plate." Item 124 was originally reported as a potential deficiency on April 27, 1984, and was subsequently documented in Reference (2).

Description of Deficiency

During the installation of Seismic Category I electrical cable tray support members, a laminar indication was observed in one A-516 Grade 70, 3" x 1/4" steel plate utilized as a diagonal bracing member. The laminar indication was not observed until the member was welded at its ends to the cable tray vertical members. Cold bending of the same type material in the fabrication shop also produced laminar indications.

The defective A-516, Grade 70 steel was purchased from Energy Steel and Supply Company, Rochester, Michigan. The defective steel was traced to heat number 59537.

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Analysis of Safety Implications

The presence of laminar indications in bracing members may cause stress concentrations at points of discontinuity (e.g. connections) and could result in structural failure of Seismic Category I electrical cable tray support.

Corrective Action

The following actions have been taken to correct this deficiency and prevent recurrence:

- Detroit Edison isolated the problem of laminations in ASTM-A516 Grade 70 steel to material that was received and used after February 9, 1984. Because the fabricator had no 3" x 1/4" bar steel on this date, Design Change Request (DCR) E-4897 was written to permit substitution with larger bar stock. The deficiencies were identified on the 3" x 1/4" bar that was purchased to replenish the fabricator's supply.

- On April 26, 1984, Detroit Edison's Field Engineering determined that suspect steel was received on three purchase orders between February 9, 1984 and April 1, 1984; therefore, this steel was segregated and placed on hold. Sixty-one samples of steel were taken from the material on hold and sent to Detroit Edison's Engineering-Research Department (ERD) for testing along with the steel bar that laminated during bending. ERD concluded that the laminations were produced by alumina inclusions in the material. The alumina inclusions were not continuous along the member but fragmented. Of the sixty-one samples tested, all of the pieces contained minor stringers and four samples were found to be seriously contaminated. ERD also concluded that the decision to remove the material should be based on the design application since most of the samples did not exhibit serious defects and the laminations would only occur if the member was subjected to bending, heat-treating or welding. Lamination would not occur if the member was subjected to tensile stress.

- Detroit Edison's Quality Assurance Department identified that all of the sixty-one steel samples sent to ERD were from heat number 59537. Energy Steel and Supply Co., the supplier that furnished the steel from heat number 59537, performed a review of their records and determined that only 160 pieces of the steel from the affected heat were supplied to the site on two separate purchase order numbers: A-118645 and A-118601. These purchase orders arrived on site and were released to the installation contractor on February 23, 1984 and March 7, 1984, respectively. In this time frame sixty-seven electrical cable tray supports were installed or modified using 3" x 1/4" bar steel.

- Sargent & Lundy Engineers evaluated the connections of all hangers where the material was used as a tension brace. Design Change Requests (DCR's) 10715, 10716, 10729, 10753, 10754, 10760 and DCR E-4468 Rev. B were issued to reinforce the connections on these hangers as required. On the remaining three hangers, the material was used for reinforcing instead of a tension brace; these bars will be replaced with new steel.

- Ten samples from two different heats of ASTM A-516 Grade 70, 1/4" steel plate on site were examined for alumina inclusions and none was identified. In addition, for several years, another contractor on-site has tested ASTM A-516 Grade 70 steel plate and no alumina defects have been identified as a result of that testing program. Therefore, since the defective material is traceable to a single heat number, the problem is related to specific material purchases and not to ASTM A-516 Grade 70 steel plate.

- All steel plate material from heat number 59537 which has not been installed remains on hold and will be returned to the vendor.

This is Detroit Edison's final report on this item. If you have questions concerning this matter please contact Mr. Lewis Bregni, (313) 586-5083.

Sincerely,

Wayne H. Jens

cc: Mr. P. M. Byron
Mr. R. C. DeYoung
Mr. R. C. Knop