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November 27, 1984  
EF2-70042

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,  
July 16, 1984, EF2-69287
  - (3) Letter, W. H. Jens to J. G. Keppler,  
October 17, 1984, EF2-70027

Subject: Final Report of 10CFR50.55(e) Item 129  
"Lack of Design Calculations for HVAC Duct  
Supports"

This is Detroit Edison's final report of Item 129, "Lack of Design Calculations for HVAC Duct Supports." Item 129 was originally reported as a potential design deficiency on June 14, 1984, and supplemental information was provided in References (2) and (3).

Description of Deficiency

As reported in Reference (2), design calculations for safety related heating, ventilation and air conditioning (HVAC) ductwork supports cannot be located. Safety-related HVAC ductwork design, fabrication and installation was contracted to the Robert Irsay Company of Chicago, Illinois. Seismic qualification of the ductwork and structural design of the supports was subcontracted to the Fluor-Pioneer Company, an Architect/Engineer firm from Chicago, Illinois.

Reference (2) reported that Detroit Edison's preliminary assessment indicated that at least one HVAC support design did not meet the rigid support assumption used in the ductwork seismic analysis. Detroit Edison committed to reanalyze the safety-related ductwork supports for which calculations could not be located. This analysis consisted of

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Mr. James G. Keppler  
November 27, 1984  
EF2-70042  
Page 2

determining, for each support, the bounding conditions necessary to assure the validity of the seismic qualification of the ductwork supports. When the support drawings were compared to its calculated bounding conditions, 11 of the 567 supports required modifications to maintain the ductwork seismic qualification.

As reported in reference (3), a sample of the HVAC supports was inspected to verify the support drawings. This inspection revealed that some of the hanger attachment points were noticeably off the center of the base plates. The attachment points of the hangers to the base plates were not detailed on the support drawings although the base plate design assumptions placed the attachment point at the center of the base plate. Although this situation did not directly affect the seismic design of the supports, the off center attachment had an adverse affect on the base plate anchor bolt loading.

To permit a detailed assessment of the affect on anchor bolt loading, Detroit Edison performed a walkdown of the safety related Irsay/Fluor designed HVAC supports in the reactor and auxiliary buildings. During this walkdown, the support configurations were verified; the hanger attachment points were identified; and, any installation deficiencies were identified and documented. During this walkdown, approximately 4% of the base plates were discovered to have installation deficiencies which included a hanger with welding incomplete, a base plate with 2 hangers attached, oversized bolt holes and shell type anchors pulling out of the concrete. The nonconforming conditions identified were documented on nonconformance reports.

#### Analysis of Safety Implications

HVAC system supports failure during a seismic event could result in the loss or impaired operation of safety-related HVAC systems.

#### Corrective Action

All safety-related and seismic 2 over 1 duct systems and supports designed and installed by Irsay/Fluor have been reviewed by Detroit Edison engineering to determine if similar deficiencies exist.

Mr. James G. Keppler  
November 27, 1984  
EF2-70042  
Page 3

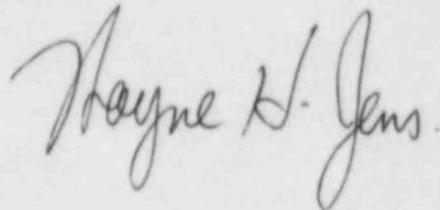
Detroit Edison's reanalysis of the supports indicated that 11 of the 567 HVAC duct supports required modifications to allow the ductwork to meet seismic qualification criteria. These modifications consisted of adding braces, replacing structural members and reinforcing existing support members. Hopper and Associates verified the methodology, organization of calculations and assumptions of this re-analysis. No discrepancies were identified.

The concern about the potential for excessive base plate anchor bolt loading was fully investigated. Worst case loads were used to establish bounding conditions for the location of the attachment point. Base plates with attachment points outside the bounding limits were individually analyzed. About 27 of the estimated 1900 base plates required modification to avoid exceeding allowable anchor bolt loads during the design seismic event.

The installation discrepancies discovered during the walk-down of the HVAC supports were documented on nonconformance reports and are being dispositioned individually.

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,



cc: P. M. Byron  
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