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July 13, 1984
EF2-69276

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

Dear Mr. Keppler:

Reference: (1) Fermi 2
NRC Docket No. 50-341

(2) Letter, D. A. Wells to J. G. Keppler,
February 3, 1984, QA-84-0078

Subject: Final Report of 10CFR50.55(e) Item 109
"Broken Valve Stem and Guide Pin on
24 Inch Globe Valve"

This is Detroit Edison's final report concerning a broken valve stem and guide pin on a 24 inch globe valve. Item 109 was originally reported as a potential deficiency on February 3, 1984, and subsequently documented in Reference (2).

Description of the Deficiency

Valve V15-2018 is a 24 inch flow control valve in the RHR service water system manufactured by the Wm. Powell Company. During checkout and initial operation flushing of the Division I RHR service water system, severe vibrations were experienced by the flow control valve. The valve was inspected and the guide pin was found to have been broken off below the disc on the valve. This allowed the disc to vibrate and induced cyclic stresses in the valve stem. Consequently the valve stem failed due to fatigue.

Wm. Powell Company performed a quantitative spectrographic analysis, a visual inspection, and a visual microscopic examination of polished and etched specimens from the guide pin. From these examinations, no cause of the guide pin failure could be determined.

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Based on the history of operation of this valve, the damage to the valve components appears to be due to excessive vibration. The vibration was apparently caused by operation of the RHR service water loop with flow rates that required throttling the valve outside its optimum range. It has been determined that because of a very low piping resistance, the valve was absorbing nearly all of the system pressure drop during checkout and initial operation.

Analysis of Safety Implications

This failure could have adversely affected the capability of the RHR service water system to perform its heat removal function.

Corrective Action

The damaged components of valve V15-2018 were replaced. The identical valve (V15-2019) in Division II of the RHR service water system was examined and no similar damage was found. An orifice was installed in each loop of the RHRSW piping to reduce the pressure drop across the valves. During subsequent preoperational testing of the valves, no significant valve vibration was observed. Operating personnel have been made aware of the operating characteristics of these valves, and the System Operating Procedure (SOP) will be revised to limit valve operation outside the optimum throttling range.

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

Sincerely,

Wayne H. Jens

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