

Harry Tauber  
Vice President  
Engineering and Construction

**Detroit  
Edison**

2000 Second Avenue  
Detroit, Michigan 48226  
(313) 237-8000

October 11, 1982  
EF2 - 60,002

Mr. L. L. Kintner  
U. S. Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation  
Division of Licensing  
Washington, D. C. 20555

Dear Mr. Kintner:

References: (1) Enrico Fermi Atomic Power Plant, Unit 2  
NRC Docket No. 50-341  
(2) Letter, H. Tauber to B. J. Youngblood,  
EF2-57,987, July 15, 1982  
(3) NEDE-24801, "Review of BWR Reactor  
Vessel Water Level Measurement",  
April, 1980

Subject: Errors in BWR Water Level Indication

This is in response to an NRC Staff request for  
further clarification of the Reference 2 letter.

The Fermi 2 water level measurement system which uses  
the cold reference leg design exclusively provides the  
level signals for both display and automatic actuation  
purposes. Temperature compensating columns (Yarways)  
are not used for any application in the Fermi 2 level  
design.

A review of the various accident scenarios analyzed in  
the General Electric NEDE-24801 report (Reference 3)  
was made by Detroit Edison. It was determined that  
the most limiting case with respect to level errors  
for a Mark I containment design was the small break  
accident where the vessel remains at pressure for one  
half hour followed by a fast depressurization by  
manual actuation of ADS (paragraph 2.3.3 of Reference 3).  
The analysis indicates that flashing in the reference  
leg would occur at the point when the reactor vessel  
pressure is decreased to the saturation pressure of  
the reference leg. For the bounding case (see Figure  
2-8 of Reference 3), this is approximately 320°F or 90  
psia.

13001

Mr. L. L. Kintner  
October 11, 1982  
EF2 - 60,002  
Page 2

The magnitude of the initial flashing phenomenon is calculated to be less than 20 percent of the vertical drop of the reference leg in the drywell proper. For the Fermi reference leg design with an actual vertical drop of 18 inches in the drywell, the flashing error would be approximately 4 inches of indicated water level. Even if the entire reference leg portion in the drywell is assumed to boil off, the maximum possible indicated error (18") will not seriously impact plant safety. Use of ADS requires that ECCS pumps are operating. In addition, complete ECCS pump actuation will have been called for due to high drywell pressure -- a signal diverse from level. The high drywell pressure actuation will occur before drywell temperature reaches the reference leg saturation temperature. In addition, automatic initiation of HPCI and RCIC is at level 2 (99 inches above the active fuel). Manual control levels are also desired to be above this range if possible. As a consequence, a level error of 18" under the worst conditions does not impact adversely manual or automatic actions.

In any case, the BWR emergency procedure guidelines being developed provide specific cautions and guidance to the operator to be aware of this phenomena. Caution No. 6 of the guidelines gives specific caution to the operator when drywell temperature approaches the saturation temperature for the reactor vessel. In addition, the drywell temperature portion of the containment control guideline keys the operator to the correct procedure when the temperature begins to approach this point.

Detroit Edison has provided a degree of enhancement in the Fermi 2 level measurement system which allows it to withstand a reference leg break and an additional single failure. By improving the diversity of the power supply feeds to the reactor level measurement transmitters, the Fermi design is able to provide continuity of water level indication in the unlikely event that one division reference leg fails and the opposite division instrument power supply is lost. This system capability provides level information which allows the operator to terminate this very unlikely event using procedure-based manual actions.

Mr. L. L. Kintner

October 11, 1982

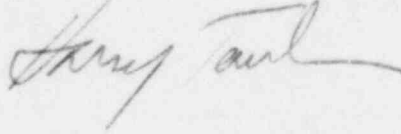
EF2 - 60,002

Page 3

As a direct result of the very small level error which results if the Fermi 2 level measurement system is challenged by the bounding event which results in reference leg flashing, Detroit Edison has concluded that the existing emergency operating procedures are adequate for the successful termination of this event and other less significant events.

Should you have any additional questions, please contact Mr. Larry E. Schuerman, (313) 649-7562.

Sincerely,

A handwritten signature in cursive script, appearing to read "Larry Schuerman", written in dark ink.

cc: Mr. B. Little