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U.S. NUCLEAR REGULATORY
COMMISSION

Mr. James P. O'Reilly, Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Serial No. 1000
PSE&C/WBR:vml:wang

Docket Nos. 50-404
50-405

Dear Mr. O'Reilly:

On December 9, 1980, a report was made under the provisions of 10CFR50.55(e) and 10CFR21, concerning accident induced neutron flux errors.

This concern was previously reported to Mr. Victor Stello of the NRC in a B&W letter of October 29, 1980.

Recent studies performed by B&W for 177FA & 205FA plants indicate that for certain transients and accidents, a decreasing downcomer reactor coolant temperature or power distribution anomalies, will result in larger neutron flux measurement errors than assumed in previous accident analyses.

The type of transients and accidents of concern are small overcooling transients, small steam line breaks, large steam line breaks in containment and rod ejection accidents. These transients and their potential consequences are discussed below:

Small overcooling transients and steam line breaks result in increased primary to secondary heat transfer. This increased heat transfer lowers the reactor coolant inlet temperature. This lower temperature causes a neutron flux measurement error by increasing neutron moderation which reduces the number of neutrons the out-of-core detectors would detect for any given power level. Since HI flux signals are required to initiate reactor trip in a timely fashion, this flux error in combination with the aforementioned events has the following consequences as determined by B&W.

- (1) Flux errors exceed those assumed in previous accident analyses.

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- (2) Reactor power safety limits are exceeded. Note that Reactor Power could reach a steady state level above the established trip envelope.
- (3) DNBR and KW/ft Safety limits may be exceeded with possible centerline fuel melt.
- (4) For a large steam line break (205FA plants only) the reactor building pressure limits could be exceeded.

For the rod ejection accident, the concern is with rods having a relatively small worth. For this case B&W has postulated a localized positive reactivity insertion which may not be large enough to be seen by the out-of-core detectors (assuming a failure of one detector) to initiate reactor trip when required. Here B&W is concerned that peak fuel enthalpy acceptance criterion may be exceeded.

While plant specific analyses have not been performed for our 145FA unit, it's apparent that the accident induced flux errors will be larger than those assumed in previous accident analyses and that similar consequences may be expected.

Veeco, S&W and B&W will be investigating this problem in the future. The NRC will be notified of any modifications which are found necessary in order to eliminate this potential safety concern.

Very truly yours,
Original Signed by
W. C. SPENCER

W. C. Spencer
Vice President - Power Station
Engineering and Construction
Services

cc: ~~_____~~
~~_____~~

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