ENCLOSURE 5

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SEP 2 7 1979

MEMORANDUM FOR: John F. Stolz, Chief, Light Water Reactors Branch #1, DPM
Robert L. Baer, Chief, Light Water Reactors Branch #2, DPM
Olan D. Parr, Chief, Light Water Reactors Branch #3, DPM
Lester Rubenstein, Acting Chief, Light Water Reactors Branch #4, DPM

FROM: Rodney M. Satterfield, Chief, Instrumentation & Control Systems Branch, DSS

SUBJECT: FOLLOW-UP ACTION WITH NEAR TERM OL APPLICANTS ON CONCERNS RAISED IN IE BULLETIN 79-21

The enclosed generic question should be forwarded to the Near Term OL Applicants so that the concerns raised in IE Bulletin 79-21 may be addressed in our review of level measurement systems.

Please advise if you have additional questions on this matter.

R. M. Satterfield

Rodney M. Satterfield, Chief
Instrumentation & Control Systems Branch, DSS

Enclosure:
As stated

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ENCLOSURE

POOR ORIGINAL

LEVEL MEASUREMENT ERRORS DUE TO ENVIRONMENTAL TEMPERATURE EFFECTS ON LEVEL INSTRUMENT REFERENCE LEGS

On June 22, 1979, Westinghouse Electric Corporation reported to NRC, a potential safety hazard under 10 CFR 21. This report addresses errors generated in the steam generator level indication sensors following high energy pipe break accidents inside containment. Further, the report implies that previous analyses of peak containment temperature and pressure may have been nonconservative. Breaks of this type can result in heatup of the steam generator level measurement reference leg resulting in a decrease of the water column density with a consequent increase in the indicated steam generator water level (i.e., indicated level exceeding actual level). IE Bulletin 79-21 includes further information on this problem and addresses appropriate actions which are to be taken by licensees of operating plants.

Applicants for an operating license are requested to submit a response to the following questions and to revise their safety analysis report consistent with this response.

1. Describe the liquid level measuring systems within containment that are used to initiate safety actions or are used to provide post-accident monitoring information. Provide a description of the type of reference leg used i.e., open column or sealed reference leg.

2. Provide an evaluation of the effect of post-accident ambient temperatures on the indicated water level to determine the change in indicated level relative to actual water level. This evaluation must include other sources of error including the effects of varying fluid pressure and flashing of reference leg to steam on the water level measurements.

3. Provide an analysis of the impact that the level measurement errors in control and protection systems (2 above) have on the assumptions used in the plant transient and accident analysis. This should include a review of all safety and control setpoints derived from level signals to verify that the setpoints will initiate the action required by the plant safety analyses throughout the range of ambient temperatures encountered by the instrumentation, including accident temperatures. If this analysis demonstrates that level measurement errors are greater than assumed in the safety analysis, address the corrective action to be taken. The corrective actions considered should include design changes that could be made to ensure that containment temperature effects are automatically accounted for. These measures may include setpoint changes as an acceptable corrective action for the short term. However, some form of temperature compensation or modification to eliminate or reduce temperature errors should be investigated as a long term solution.

4. Review and indicate the required revisions, as necessary, of emergency procedures to include specific information obtained from the review and evaluation of Items 1, 2, and 3 to ensure that the operators are instructed on the potential for and magnitude of erroneous level signals. Provide a copy of tables, curves, or correction factors that would be applied to post-accident monitoring systems that will be used by plant operators.