

PHILADELPHIA ELECTRIC COMPANY

2301 MARKET STREET

P.O. BOX 8699

PHILADELPHIA, PA. 19101

(215) 841-5001

SHIELDS L. DALTROFF
VICE PRESIDENT
ELECTRIC PRODUCTION

December 5, 1984

Docket Nos. 50-277
50-278

Mr. Darrell G. Eisenhut
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Peach Bottom Atomic Power Station
Reactor Vessel Water Level Instrumentation
in BWRs (Generic Letter No. 84-23)

Dear Mr. Eisenhut:

This letter describes our plans for implementing improvements in the reactor water level instrumentation as requested in Generic Letter No. 84-23, dated October 26, 1984. The letter stated that the reactor vessel water level instrumentation requires permanent physical improvement to be made on a deliberate schedule. Three potential improvement categories were presented, two of which require our response with a description of our plans for implementation and a proposed schedule. The NRC also stated that implementation of these two categories of improvements will give increased assurance that the level instrumentation will provide the core cooling instrumentation required by NUREG-0737, Item II.F.2. We understand that a third improvement is still being evaluated by the NRC.

Our responses to the proposed improvements for Peach Bottom Atomic Power Station follow:

1. NRC Proposal

Improvements to plant(s) that will reduce level indication errors caused by high drywell temperature: These improvements include prevention of reference leg overheating or reduction of the vertical drops in the drywell. (Vertical drop should be measured from the condensation pot to the drywell exit point. Maximum drop would allow an indicated level at the bottom of the normal operating range when actual

8412100114 841205
PDR ADOCK 05000277
P PDR

1/04/85
1/0

level is just above lower tap for worst flashing condition.) Those plants for which the vertical drop in the drywell has already been minimized will not have to make additional changes for the drywell heating effect.

Response:

The wide-range (-165" to +50") and fuel-zone (-325" to 0") reactor vessel water level instrumentation will be modified to improve accuracy and reliability under transient and accident conditions and decrease the need for operator diagnosis. The following changes will be made:

1. The two existing temperature-compensated reference columns will be removed and replaced with condensing chambers which are not temperature compensated;
2. The associated reference leg piping will be rerouted to limit the vertical drop inside the drywell to no more than three feet;
3. The instruments will be recalibrated for the revised elevation of the condensing chamber and the new reference leg ambient conditions;
4. The restricting orifices in the reference leg piping will be relocated as close to the containment penetration as practical in order to minimize the effects of flashing in the reference leg under certain postulated conditions. (See Appendix B in SIL-8211, "Review of BWR Reactor Vessel Water Level Measurement Systems", by S. Levy, inc., prepared for BWR Owners Group and referenced in Generic Letter 84-23).
5. The reference leg for the fuel-zone level instruments will be moved from the existing GEMAC condensing chambers to the new condensing chambers.

The modifications are planned to be accomplished on Unit 2 coincident with replacement of the reactor recirculation piping now in progress due to the need to have the reactor vessel drained to install the modifications. The Unit 3 modification will be included in plans for the replacement of recirculation pipe or other outage requiring draining of the reactor vessel. At this time, such an outage is not planned before 1987.

These changes will provide the necessary improvements for all instruments used by the operator for accident monitoring.

They provide level indication from the bottom of the active fuel to above normal water level as required by NUREG-0737 Item II.F.2. No changes will be made to the two existing reference legs attached to GEMAC condensing chambers used for narrow-range (0" to +60") and upset-range (-178" to -78") level indication since these instruments are not required by the operator for accident monitoring. Similarly, no change will be made to the existing reference leg attached to a GEMAC condensing chamber used for shutdown-range level indication (-21" to +371").

2. NRC Proposal

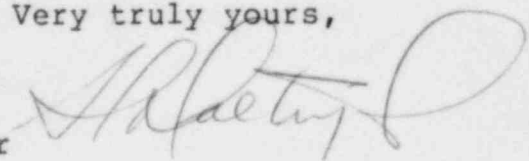
Review of plant experience relating to mechanical level indication equipment: Plant experience shows mechanical level equipment is more vulnerable to failure or malfunction than analog equipment. A number of plants have already connected analog trips units to their level transmitters to improve reliability and accuracy. Those plants that use mechanical level indication should replace the mechanical level indication equipment with analog level transmitters unless operating experience confirms high reliability.

Response

All mechanical level indication equipment used for reactor water level measurement has been replaced with analog level transmitters and trip units with the exception of four instruments used for tripping the recirculation pumps in the event of an anticipated transient without scram (ATWS). It is planned to leave the mechanical switches installed for this particular application. The potential for slightly lower reliability of these switches when compared to the analog equipment is offset by the overall increase in reliability for an ATWS event obtained by having diverse equipment to measure reactor water level.

Should you have any questions regarding this matter, please do not hesitate to contact us.

Very truly yours,



cc: J. H. Williams, Resident Inspector