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J. EDWARD HOWARD
VICE PRESIDENT
NUCLEAR ENGINEERING

July 31, 1984
BECO 84-116

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

License No. DPR-35
Docket No. 50-293

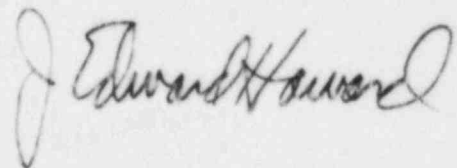
Response to "Request for Additional Information - MPA F-55
(TMI II.K.3.28) 'Qualification of ADS Accumulators'
Per 10 CFR 50.54 (f)", dated 5/29/84

Dear Sir:

In your letter of 5/29/84 you requested additional information regarding the Pilgrim ADS accumulator capacity following an accident. Pursuant to 10 CFR 50.54 (f), Boston Edison provides this requested information in the attachment to this letter. As is stated in the attached, BECo has contracted with the NSSS (General Electric Co.) to provide additional information pursuant to your request. Completion of this effort will not occur prior to the submittal of this letter but is expected no later than October 1, 1984.

Should you have any questions concerning this submittal, please do not hesitate to contact us.

Very truly yours,



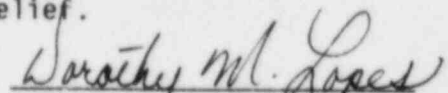
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Enclosure

Commonwealth of Massachusetts)
County of Suffolk)

Then personally appeared before me J. E. Howard, who, being duly sworn, did state that he is Vice President - Nuclear Engineering and Quality Assurance of the Boston Edison Company, the applicant herein, and that he is duly authorized to execute and file the submittal contained herein in the name and on behalf of the Boston Edison Company and that the statements in said submittal are true to the best of his knowledge and belief.

My Commission expires: JUNE 20, 1991


Notary Public

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Response to "Request for Additional Information"
(TMI II.K.3.28) Qualification of ADS Accumulators

Item 1

Pilgrim does not meet the specification of 100 day post accident operability of the ADS pneumatic supply system described in the letter. However, the ADS pneumatic supply system does meet the requirements for post accident operability specified in the Pilgrim FSAR. The following provides justification for the 8 hours cited in previous correspondence being sufficient duration for post accident operability of this subsystem.

Operation of ADS is required for three accidents in Appendix G of the FSAR:
1) Pipe Break Inside Containment, 2) Pipe Break Outside Containment, and
3) Control Rod Drop Accident.

For breaks of small and intermediate sizes, FSAR Section 6.5 shows that reactor vessel depressurization to less than 100 psig occurs within 20 minutes of a Pipe Break Inside Containment. At this point, the Shutdown Cooling Mode (SDC) of RHR can be placed in operation, thereby preventing vessel repressurization.

For the other two accidents, operator action is required to depressurize the vessel prior to initiation of SDC (FSAR Appendix G). Although the FSAR does not specify a time at which such action will be performed, it could be reasonably expected within 8 hours. Thus the performance capability of the ADS accumulators is adequate for the requirements of the Pilgrim FSAR, and it is not necessary to upgrade the ADS pneumatic supply system to comply with NUREG 0737 Item II.K.3.28.

BECO is, however, pursuing the issue of ADS valve post accident performance requirements under a contract with General Electric. This effort will determine the following: 1) the basis for the 100 day operability time, 2) whether or not 100 day post accident operability of the ADS valves is required for conformance with 10 CFR 50.46 (b)(5), and 3) the minimum required time for which the ADS valves must function following an accident. Completion of this effort is expected no later than October 1, 1984.

Item 2

Unless specified otherwise, figures given below are from Reference 3.

Accumulator Volume

Accumulator volume is 6494 in³ (28 gallons).

Pressure Available at the End of 8 Hours

The accumulator pressure available 8 hours after loss of the instrument air supply under post accident conditions is 78 psig which is equal to 36 psid with respect to Drywell pressure under those conditions.

The ADS valves and accumulators are located in the drywell. Post accident conditions are taken from the LOCA containment response curves in the FSAR

(Figures 14.7-10 and 14.7-11). The pressure used is 27 psig which is the maximum drywell pressure from 10 seconds after the accident. The temperature used is 167°F which is the lowest temperature shown on Figure 14.7-11. Choosing a lower temperature is conservative since lower temperatures lead to lower pressures in an isolated accumulator. It is assumed that instrument air is lost at the time of the accident.

Before the postulated accident, the drywell pressure is normal atmospheric pressure and the drywell temperature is 135°F (FSAR Table 5.2-2). The accumulator pressure is 90 psid, or 105 psia (Reference 5).

At the start of the postulated accident, the increase in drywell temperature causes accumulator absolute pressure to increase from 105 psia to 110 psia, while the increase in drywell pressure causes accumulator differential pressure to go from 90 psid to 68 psid. Assuming leakage is 4 psi/hr (see below under "Leakage rate allowable"), 78 psid is the pressure at the end of 8 hrs. This exceeds the pressure required for 20 ADS valve actuations by 4 psi.

Leakage Rate Allowable

The procedure for ADS accumulator leakage (Reference 4) testing specifies that acceptable leakage is 84 psid decreasing to not less than 70 psid over 4 hours, which is 3.5 psi/hr average. Since 84 psid is greater than accumulator differential pressure under accident conditions, the use of 4 psi/hr above is acceptable.

Pressure Required for Valve Operation

The initial accumulator pressure required for a single ADS valve actuation is 25 psid, which is equal to 67 psia under post accident conditions. The initial accumulator pressure required for 20 successive actuations under post accident conditions is 74 psia. Thus, there is a 4 psi margin in the pressure available after 8 hours.

The decrease in accumulator pressure due to ADS valve actuation was derived assuming adiabatic flow from the accumulator to the valve operator.

References

1. Pilgrim FSAR Sections 3, 4, 5, 6, 7, 10, 14, Appendix G
2. 10 CFR 50.46
3. Boston Edison Calculations
4. PNPS Procedure 8.7.1.10, "Test of ADS Accumulator System"
5. PNPS Procedure 2.2.36, "Instrument Air System"