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TO:
Mr. R. S. Boyd

FROM:
Washington Public Power Supply System
Richland, Washington
D. L. Renberger

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DESCRIPTION

Ltr. re our 6/25/76, 4/7/76 and 12/9/75 ltrs. and G.E.'s 6/30/76 and 9/28/76 and 9/30/76 ltrs....concerning Anticipated Transients Without Scram.

(4-P)

PLANT NAME:
WPPSS 2

ENCLOSURE

ACKNOWLEDGED

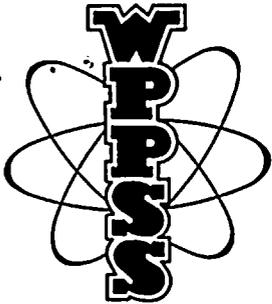
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Washington Public Power Supply System
A JOINT OPERATING AGENCY

Regulatory Docket File

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DOCKET NO. 50-397

December 28, 1976
602-76-571

Mr. R. S. Boyd, Director
Division of Project Management
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555



SUBJECT: WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECT NO. 2 (FORMERLY HANFORD NO. 2)
ANTICIPATED TRANSIENTS WITHOUT SCRAM

- REFERENCES:
- 1) Letter, R.S. Boyd (NRC) to J.J. Stein (WPPSS) same subject, June 25, 1976
 - 2) R.E. Heineman (NRC) to I.F. Stuart (GE), same subject, April 7, 1976
 - 3) NRC Status Report on ATWS for General Electric Reactors, December 9, 1975
 - 4) General Electric ATWS Report, June 30, 1976
 - 5) General Electric ATWS Report, Supplement 1, September 28, 1976
 - 6) Appendix A and B-General Electric ATWS Report for BWR/4, and BWR/5 General Electric ATWS Report, September 30, 1976
 - 7) General Electric Company BWR Scram System Reliability Analysis, Part I, Part II, Appendix, September 30, 1976
 - 8) EPRI NP-251, ATWS: A Reappraisal Part 1: An Examination and Analysis of WASH-1270, Technical Report on ATWS for Water-Cooled Power Reactors, August 1976

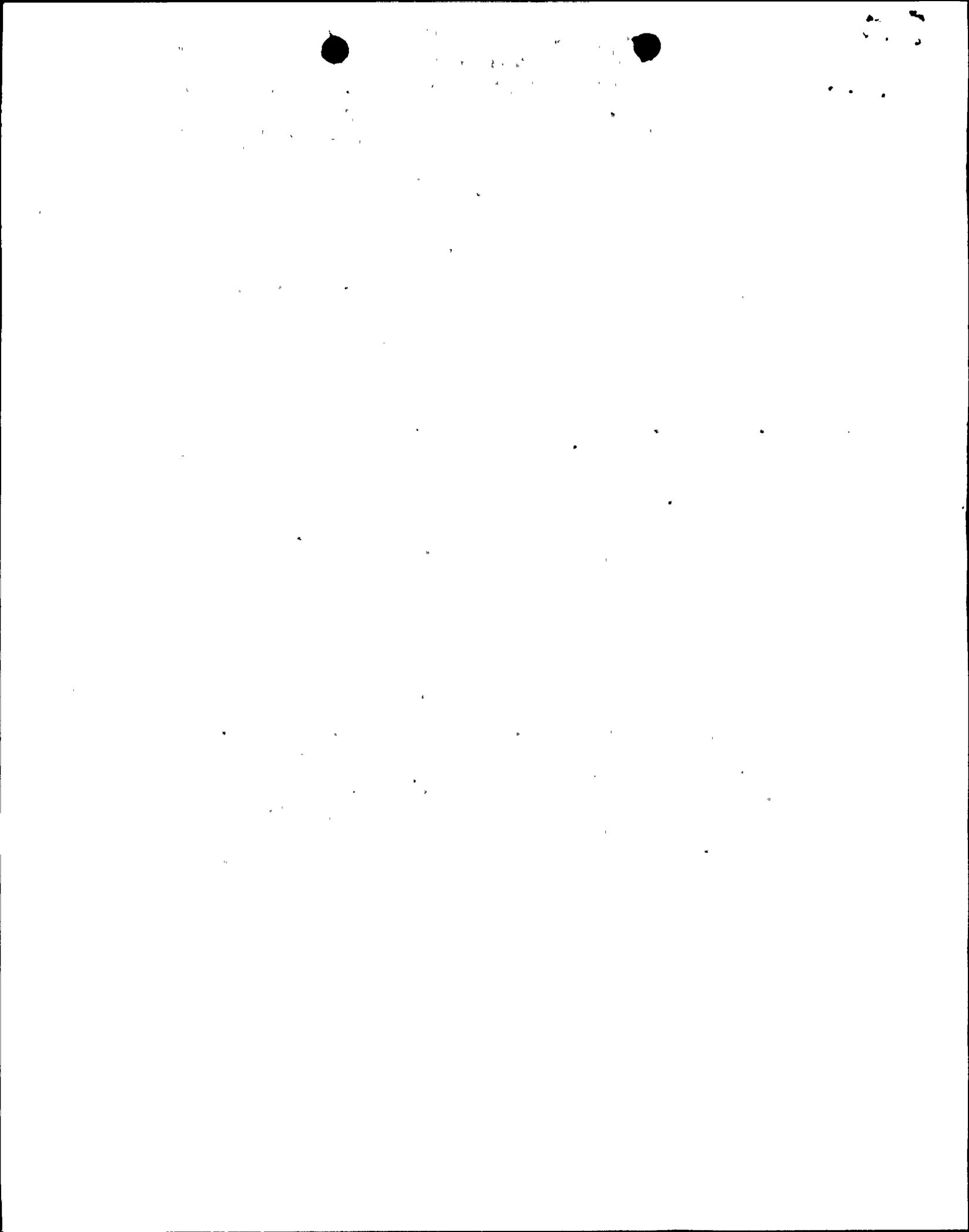
Dear Mr. Boyd:

On July 20, 1976, Washington Public Power Supply System (WPPSS) received a letter, reference 1, which summarized the NRC's generic review of Anticipated Transients Without Scram (ATWS) as they related to WPPSS

Nuclear Project No. 2. In addition, the NRC requested that WPPSS provide, by December 30, 1976, information which would define the design changes needed to assure that the limits specified in WASH-1270 would not be violated following a postulated ATWS event and the schedule for implementing the changes. This letter is our response to your request for that information.

WPPSS has been involved in various discussions with industry groups, other BWR owners and General Electric concerning the ATWS issue for the past several years and concurs with the NRC staff in its desire to resolve ATWS in the best interest of the health and safety of the public. In an effort to accomplish this objective, we have remained fully aware of the information that General Electric has provided to the Commission in response to various requests. Most recently, the NRC (reference 2) requested that General Electric provide a resolution of the matters identified in the December 9, 1975, NRC Status Report, (reference 3), as related to the General Electric analysis model used to develop the generic response to WASH-1270. The generic response, NEDO-20626, "Analysis of ATWS for GE BWR's", October 1974 provided a description of plant features which could be used to limit the consequences of a hypothetical ATWS event. In response to reference 2, the generic BWR/6-251 General Electric, June 30 report (reference 4), Supplement 1 (reference 5) and Appendix A and B, (reference 6) have been submitted. Appendix B which applies specifically to BWR/5's in conjunction with appropriate sections of the generic June 30 Report and Supplement 1 responds to your request for additional analyses (reference 1) as applied to WNP-2.

The bases for identifying plant changes (references 4, 5, 6) which could mitigate the consequences of a hypothetical ATWS event resulted as a vendor response to the WASH-1270 staff position. The NRC Status Report states that the normal reactivity shutdown and backup shutdown systems must be sufficiently reliable that the probability of an anticipated transient resulting in unacceptable consequences would be of the order of 10^{-7} /reactor-year to satisfactorily resolve the ATWS issue. This staff position was established following the staff's evaluation of the Light Water Reactor scram system reliabilities. WPPSS believes that the BWR reactor protection (RPS) and the control rod drive (CRD) systems are substantially more reliable than indicated by WASH-1270. This conclusion is supported by the results of two independent reliability analyses on these systems. Both of these studies have been submitted to the NRC for review. The first, a General Electric program undertaken to establish the actual reliability of the RPS and CRD systems, was initially discussed as part of the resolution to ATWS in the June 30 Report (reference 4) A complete documentation of this study is provided by reference 7. The GE analysis concludes that the ATWS safety objective of 10^{-7} can be met and in fact exceeded by a design change to the reactor scram system. This addition to the scram system, the Alternate Rod Scram System (ARSS) would provide diversity and reliability enhancement in those areas

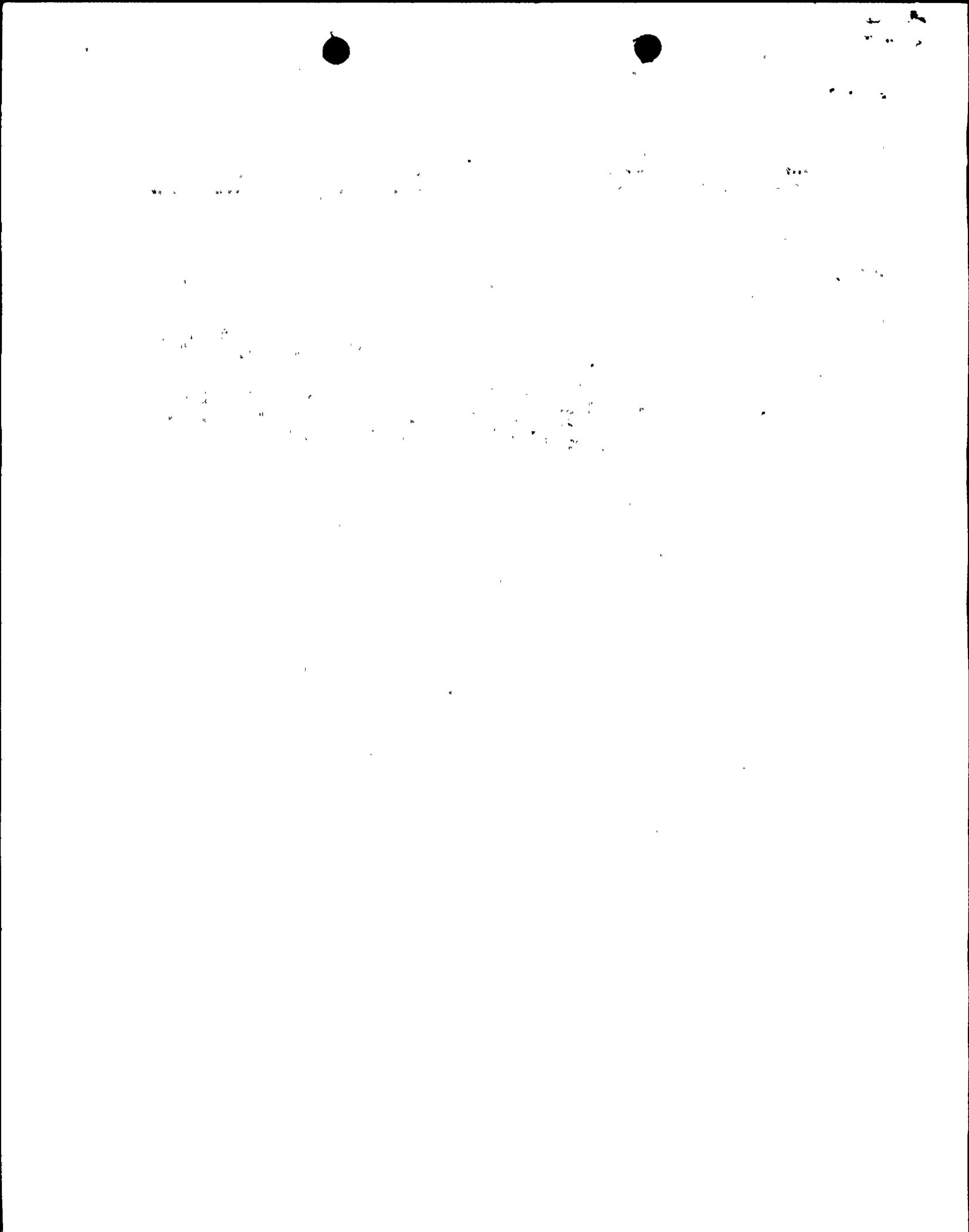


required to meet the objective (10^{-7}). The second study (reference 8) was prepared under the direction of the Electric Power Research Institute, (EPRI) and involved an extensive evaluation of the WASH-1270 methodology and data base. This report complements the GE reliability analyses which concludes that the BWR scram system is substantially more reliable than indicated by WASH-1270. These results must be considered and properly evaluated to effect a resolution to the ATWS issue.

WPPSS has studied the impact of implementing the modification requirements defined by the December 9, 1975 NRC Status Report as detailed in the General Electric June 30 Report, and Supplement 1 and Appendix B both issued September 1976 and has determined the associated cost impact on the project. We have estimated that an expenditure of approximately \$88.0 million would be required to implement these modifications. In addition, implementation would require a 21 month delay in scheduled fuel load. This delay would cost \$185.0 million and is composed of \$1.6 million/month for increased fuel costs, \$5.8 million/month for interest during construction and \$1.4 million/month for direct owners costs. Replacement power costs were not considered for these estimates. WPPSS has concluded that these costs are not warranted in terms of the expected improvement in plant safety. This conclusion is based on the premise that the alternative, ARSS, will actually provide a larger degree of safety with a substantially lower cost impact. The addition of ARSS to the existing scram system as defined in reference 7, will increase the reliability of the existing system such that the unreliability is less than the NRC limit of 10^{-7} and can be implemented at an estimated expenditure of between \$200,000 and \$500,000 with no delay in scheduled fuel load date.

WPPSS believes the resolution of the ATWS issue for WNP-2 must be based on the best technology currently available. We urge that the NRC and its consultants thoroughly investigate the General Electric and EPRI reliability assessments, compare and review the methodologies used with the best technology available to date and establish a position based on this review. WPPSS firmly believes that upon conducting such a review the reliability assessments will show the existing BWR/5 scram system, in conjunction with ARSS, to be of such reliability that an ATWS event is sufficiently incredible ($<10^{-7}$ events/reactor year) to obviate the need for any mitigating measures required to accommodate ATWS as a new design basis event.

In summary, WPPSS believes that the ATWS issue can be resolved to the best interest of the health and safety of the public by implementing the ARSS modifications. WPPSS requests that the NRC perform the necessary



detailed review of the two reliability reports discussed above to ascertain that this solution is both acceptable and, in fact, preferable. Upon receipt of your concurrence, we will proceed with implementing the ARSS additions to WNP-2 to achieve the required scram system reliability. Your prompt attention to our requests are important to a timely completion of plant construction.

Very truly yours,

D L Renberger

D. L. RENBERGER
Assistant Director
Generation and Technology

DLR:GLG:DLW:ks

cc: JJ Byrnes - B&R
JJ Verderber - B&R
FA MacLean - GE
SA Varga - NRC
D. Roe - BPA