

AUG 25 1987

Docket Nos.: 50-528, 50-529
and 50-530

Mr. E. E. Van Brunt, Jr.
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Dear Mr. Van Brunt:

SUBJECT: REVIEW OF SOFTWARE CHANGES TO THE CORE PROTECTION CALCULATOR -
PALO VERDE, UNITS 1, 2 AND 3 (TAC NOS. 65920, 65921 AND 65922)

By letter dated July 13, 1987, you requested our approval for certain changes in Core Protection Calculator (CPC) constants, relating to Loss of Flow Protection, to be made with the NRC approved procedure (CEN 39(A)-P, Revision 03-P-A) for such changes.

We have completed our review of your request and have determined that the proposed changes to the CPC constants are acceptable. Our detailed evaluation is enclosed.

If you have any questions regarding this letter, please let me know.

Sincerely,

Original signed by:
E. A. Licitra _____

E. A. Licitra, Senior Project Manager
Project Directorate V
Division of Reactor Projects - III,
IV, V and Special Projects

Enclosure:
As stated

cc: See next page

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Mr. E. E. Van Brunt, Jr.
Arizona Nuclear Power Project

Palo Verde

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

EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
CORE PROTECTION CALCULATOR SOFTWARE CHANGES
PALO VERDE NUCLEAR GENERATING STATION UNITS 1, 2 AND 3
ARIZONA NUCLEAR POWER PROJECT

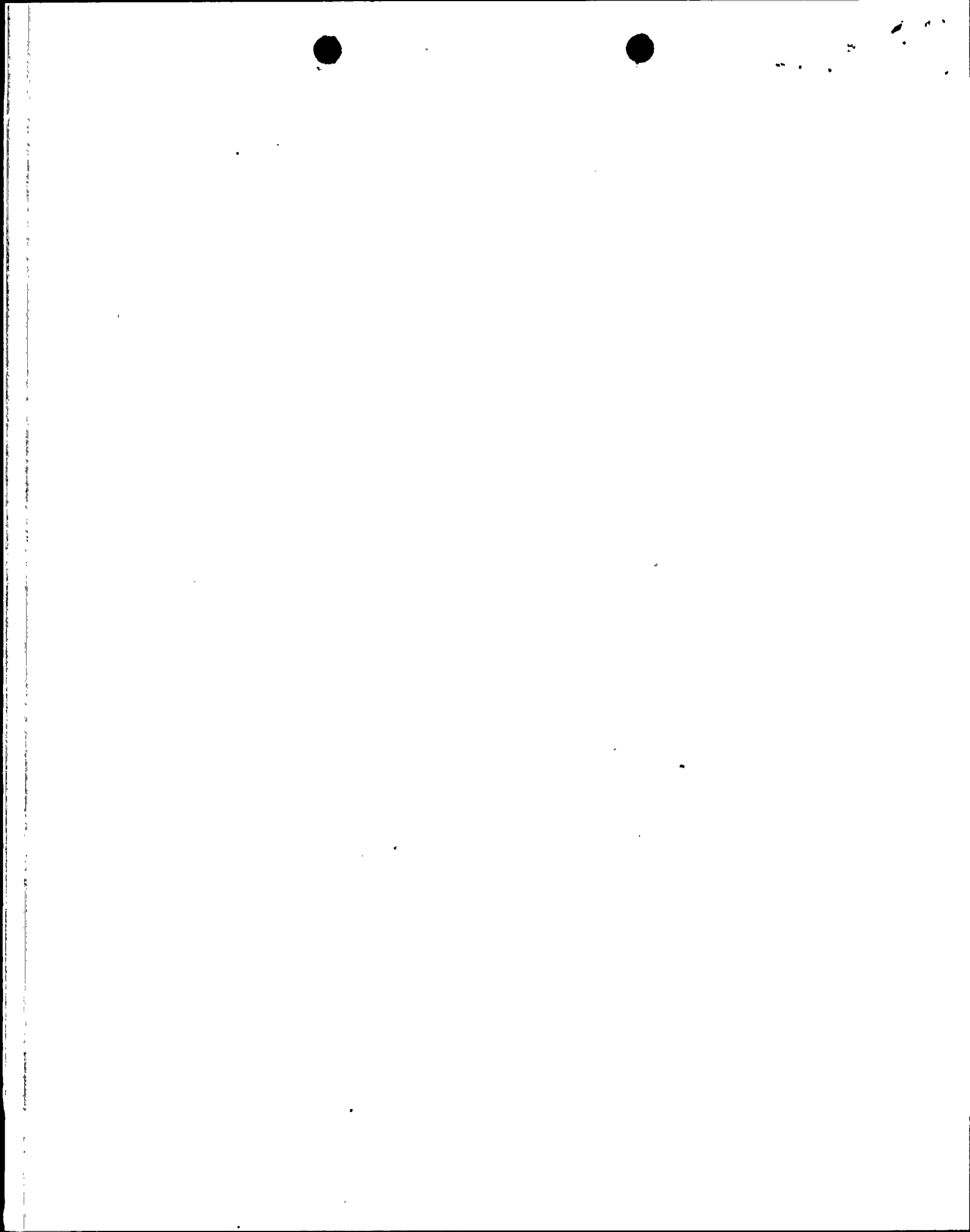
1.0 INTRODUCTION

By letter dated July 13, 1987 (161-00362-JGH/JRP), Arizona Nuclear Power Project (ANPP) submitted background information on changes to be made to Core Protection Calculator (CPC) constants related to loss of flow event protection at the Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2 and 3. These changes will prevent unnecessary reactor trips during a fast bus transfer event. Although no Technical Specification changes are necessary as a result of these CPC software changes, NRC approval is required as stated in Section 6.8.1.g of the PVNGS Technical Specifications.

2.0 EVALUATION

The loss of coolant flow event was reanalyzed assuming a trip on low reactor coolant pump (RCP) speed rather than the previously assumed trip on projected low DNBR. A CPC trip is initiated when the RCP shaft speed drops to 95% of its nominal speed. This modification has been made in other recent CPC plants.

The most limiting loss of flow event, the 4-pump total loss of flow, was the event reanalyzed. The licensee used an approved methodology to determine the reactor core response. In addition, a faster (more conservative) flow coastdown curve was used than that assumed in the FSAR analysis. This revised curve bounds the coastdowns observed during startup testing at PVNGS, Units 1 and 2. The trip breakers are assumed to open 0.3 seconds after the RCP shaft speed reaches 95% of its nominal speed and the control element assemblies (CEAs) begin to drop 1.25 seconds after the initiation of the event as compared to 1.09 seconds in the previous analysis. The results indicate that



the minimum DNBR limit of 1.231 is not violated and the pressures in the reactor coolant and main steam systems remain below 110% of the design values.

Based on the loss of flow event results and on the fact that the software changes will be made in accordance with the NRC approved software change procedure (CEN-39(A)-P, Rev. 03-P-A, November 1986), the staff finds the proposed changes to the CPC constants to be acceptable.

3.0 CONCLUSION

The staff has reviewed the information on changes to be made to CPC constants related to loss of flow protection and finds the proposed changes acceptable for implementation at PVNGS, Units 1, 2 and 3.

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