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RECIP. NAME	RECIPIENT AFFILIATION
KNIGHTON, G. W.	PWR Project Directorate 7

SUBJECT: Requests review & approval of facilities Cycle 1 core protection calculator algorithm mods. Core protection calculator software algorithm & executive program changes encl.

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December 19, 1986
ANPP-39452-JGH/LJM/98.05

Director of Nuclear Reactor Regulation
Attention: Mr. George W. Knighton, Project Director
PWR Project Directorate #7
Division of Pressurized Water Reactor Licensing - B
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN 50-528 (License NPF-41)
STN 50-529 (License NPF-51)
STN 50-530
PVNGS Cycle 1 Core Protection Calculator (CPC)
Software Modifications
File: 86-056-026

Dear Mr. Knighton:

ANPP is planning to implement the CPC software modifications identified in Attachment 1. These algorithm changes are described in detail in CEN-281(S)-P, Revision 01-P, CPC/CEAC Software Modifications for San Onofre Nuclear Generating Station 2 and 3, November, 1984, and were first reviewed by the staff for San Onofre Nuclear Generating Station 2 and 3. We are requesting your review and approval of the same algorithm modifications as described in CEN-281(S)-P for PVNGS Unit 1, 2 and 3. This description is directly applicable to PVNGS.

The changes are being made to enhance operation throughout the cycle and reduce the occurrence of unnecessary trips. With these modifications, ANPP will be implementing one component of the currently planned efforts to improve the CPC system performance and mitigate the problems caused by the flow projected Departure from Nucleate Boiling Ratio (DNBR) trip algorithm being too sensitive to underfrequency events. Your response to these changes is needed by February 1, 1987, to insure there will be no significant impact to the operation of Unit 1, Cycle 1.

In addition to the algorithm modifications described above, we plan to correct the CPC Executive program problems which were identified during startup testing. These changes are summarized in Attachment 1. The Executive program changes do not affect the Departure from Nucleate Boiling Ratio/Local Power Density (DNBR/LPD) Calculations and, therefore, are not important to safety and will be reviewed per 10 CFR 50.59, Unreviewed Safety Questions.

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If you should have any questions concerning this matter, contact Mr. W. F. Quinn of my staff.

Very truly yours,

JG Haynes

J. G. Haynes
Vice President
Nuclear Production

JGH/LJM/rw
Attachment

cc: O. M. De Michele
E. E. Van Brunt Jr.
E. A. Licitra
R. P. Zimmerman
A. C. Gehr

ATTACHMENT 1

CPC Software Algorithm Changes

- Modification of Temperature Shadowing Factor Algorithm
- Modification of the CPC Power Bias Algorithm
- Improvement to UPDATE Algorithm
- Modification of Heat Flux Distribution Extrapolation in STATIC
- Modification of DNBR Penalty for ASGT in UPDATE

CPC Executive Program Changes

- Correct the continuous auto-restart problem during periodic testing when the test cart terminal is not connected.
- Correct the error codes and messages for parity error, power failure and auto-restart.
- Reverse the control element assembly (CEA) position isolation amplifier (CPIA) test enable light on/off sequence to be consistent with the test cart.
- Correct the round-off error in displaying floating point numbers on the operator module.
- Remove plant monitoring system (PMS) data from the CPC algorithm memory scratch storage.
- Remove unused CEAs from the CPC-PMS data link transmission.