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 STN-50-529 Palo Verde Nuclear Station, Unit 2, Arizona Publi 05000529
 STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Publi 05000530
 AUTH. NAME AUTHOR AFFILIATION
 HAYNES, J. G. Arizona Nuclear Power Project (formerly Arizona Public Serv
 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.

DISTRIBUTION CODE: B021D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 3
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NOTES: Standardized plant. M. Davis, NRR: 1Cy. 05000528
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RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
PWR-B ADTS	1 1	PWR-B EB	1 1
PWR-B PEICSB	2 2	PWR-B FOB	1 1
PWR-B PD7 LA	1 0	PWR-B PD7 PD 05	1 1
LICITRA, E 01	1 1	PWR-B PEICSB	1 1
PWR-B RSB	1 1		

INTERNAL: ACRS 29	8 8	ADM/LFMB	1 0
ELD/HDS3	1 0	NRR BWR ADTS	1 1
NRR PWR-A ADTS	1 1	NRR PWR-B ADTS	1 1
NRR/DSRO DIR	1 1	NRR/ORAS	1 1
REQ FILE 04	1 1	RGN5	1 1
RM/DDAMI/MIB	1 0		

EXTERNAL: LPDR 03	1 1	NRC PDR 02	1 1
NSIC 06	1 1	PNL GRUEL, R	1 1

NOTES: 1 1

1. The first step in the process of identifying a problem is to recognize that a problem exists. This involves gathering information about the situation and identifying the specific issue that needs to be addressed.

Figure 1 consists of nine line drawings arranged in a 3x3 grid, labeled 1 through 9. Each drawing represents a child's drawing of a person at a specific age. The drawings show a progression from simple, basic shapes to more complex and detailed figures. Drawing 1 (age 2) is a simple stick figure. Drawing 2 (age 3) adds a head and limbs. Drawing 3 (age 4) shows more defined features like a face and clothing. Drawing 4 (age 5) includes more detail like hair and shoes. Drawing 5 (age 6) shows a more complete figure with facial features and clothing. Drawing 6 (age 7) is a more refined drawing with clear facial features and clothing. Drawing 7 (age 8) is a highly detailed drawing with many features. Drawing 8 (age 9) is a very detailed drawing with many features. Drawing 9 (age 10) is a highly detailed drawing with many features.

DATE	TIME	LOCATION	DESCRIPTION	AMOUNT	CHECK NO.	BANK	REMARKS
1/1/78	10:00	ATM	ATM WITHDRAWAL	100.00	1001	CHASE	ATM WITHDRAWAL
1/2/78	11:00	ATM	ATM WITHDRAWAL	50.00	1002	CHASE	ATM WITHDRAWAL
1/3/78	12:00	ATM	ATM WITHDRAWAL	25.00	1003	CHASE	ATM WITHDRAWAL
1/4/78	13:00	ATM	ATM WITHDRAWAL	75.00	1004	CHASE	ATM WITHDRAWAL
1/5/78	14:00	ATM	ATM WITHDRAWAL	100.00	1005	CHASE	ATM WITHDRAWAL
1/6/78	15:00	ATM	ATM WITHDRAWAL	50.00	1006	CHASE	ATM WITHDRAWAL
1/7/78	16:00	ATM	ATM WITHDRAWAL	25.00	1007	CHASE	ATM WITHDRAWAL
1/8/78	17:00	ATM	ATM WITHDRAWAL	75.00	1008	CHASE	ATM WITHDRAWAL
1/9/78	18:00	ATM	ATM WITHDRAWAL	100.00	1009	CHASE	ATM WITHDRAWAL
1/10/78	19:00	ATM	ATM WITHDRAWAL	50.00	1010	CHASE	ATM WITHDRAWAL
1/11/78	20:00	ATM	ATM WITHDRAWAL	25.00	1011	CHASE	ATM WITHDRAWAL
1/12/78	21:00	ATM	ATM WITHDRAWAL	75.00	1012	CHASE	ATM WITHDRAWAL
1/13/78	22:00	ATM	ATM WITHDRAWAL	100.00	1013	CHASE	ATM WITHDRAWAL
1/14/78	23:00	ATM	ATM WITHDRAWAL	50.00	1014	CHASE	ATM WITHDRAWAL
1/15/78	24:00	ATM	ATM WITHDRAWAL	25.00	1015	CHASE	ATM WITHDRAWAL
1/16/78	25:00	ATM	ATM WITHDRAWAL	75.00	1016	CHASE	ATM WITHDRAWAL
1/17/78	26:00	ATM	ATM WITHDRAWAL	100.00	1017	CHASE	ATM WITHDRAWAL
1/18/78	27:00	ATM	ATM WITHDRAWAL	50.00	1018	CHASE	ATM WITHDRAWAL
1/19/78	28:00	ATM	ATM WITHDRAWAL	25.00	1019	CHASE	ATM WITHDRAWAL
1/20/78	29:00	ATM	ATM WITHDRAWAL	75.00	1020	CHASE	ATM WITHDRAWAL
1/21/78	30:00	ATM	ATM WITHDRAWAL	100.00	1021	CHASE	ATM WITHDRAWAL
1/22/78	31:00	ATM	ATM WITHDRAWAL	50.00	1022	CHASE	ATM WITHDRAWAL
1/23/78	32:00	ATM	ATM WITHDRAWAL	25.00	1023	CHASE	ATM WITHDRAWAL
1/24/78	33:00	ATM	ATM WITHDRAWAL	75.00	1024	CHASE	ATM WITHDRAWAL
1/25/78	34:00	ATM	ATM WITHDRAWAL	100.00	1025	CHASE	ATM WITHDRAWAL
1/26/78	35:00	ATM	ATM WITHDRAWAL	50.00	1026	CHASE	ATM WITHDRAWAL
1/27/78	36:00	ATM	ATM WITHDRAWAL	25.00	1027	CHASE	ATM WITHDRAWAL
1/28/78	37:00	ATM	ATM WITHDRAWAL	75.00	1028	CHASE	ATM WITHDRAWAL
1/29/78	38:00	ATM	ATM WITHDRAWAL	100.00	1029	CHASE	ATM WITHDRAWAL
1/30/78	39:00	ATM	ATM WITHDRAWAL	50.00	1030	CHASE	ATM WITHDRAWAL
1/31/78	40:00	ATM	ATM WITHDRAWAL	25.00	1031	CHASE	ATM WITHDRAWAL



Arizona Nuclear Power Project

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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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Mr. George W. Knighton
Subject: Software Modifications
ANPP- 39452
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If you should have any questions concerning this matter, contact Mr. W. F. Quinn
of my staff.

Very truly yours,



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.

