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SUBJECT: Forwards response to RAI re proposed amend,changing Note 5 to Table 4.3-1 of TS 3/4.3.1 to allow verification of shape annealing matrix elements used in CPCs,providing option of using generic shape annealing matri elements.

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WILLIAM L. STEWART
EXECUTIVE VICE PRESIDENT
NUCLEAR

102-03432-WLS/AKK/RKR
August 1, 1995

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Reference: Letter No. 102-03201, dated December 7, 1994, from W. L. Stewart, Executive Vice President, Nuclear, APS, to USNRC

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Request for Additional Information for Proposed Amendment to Technical Specification 3/4.3.1, Table 4.3-1

Brian Holian of your staff requested additional information to complete the review of the amendment to Technical Specification 3/4.3.1, Table 4.3-1 (referenced above). The proposed amendment will change Note 5 to Table 4.3-1 of Technical Specification 3/4.3.1 to allow verification of the shape annealing matrix elements used in the Core Protection Calculators, providing the option of using generic shape annealing matrix elements. The enclosure to this letter provides the requested information.

Should you have any questions, please contact Scott A. Bauer at (602) 393-5978.

Sincerely,

WLS/SAB/RKR/rv
Enclosure

cc: L. J. Callan
K. E. Perkins
B. E. Holian
K. E. Johnston
A. V. Godwin (ARRA)

A001

ENCLOSURE

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION FOR PROPOSED AMENDMENT TO TECHNICAL SPECIFICATION 3/4.3.1, TABLE 4.3-1

1. NRC Request:

A previous anomaly at another CPC plant indicated that the CPCs calculated a cosine type axial shape throughout the cycle rather than the expected evolution from flattened cosine to a saddle shape as predicted for middle of cycle (MOC) through end of cycle (EOC). What will the generic shape annealing matrix (SAM) look like?

APS Response:

The actual core axial shape is dependent on the fuel management and time in life for the cycle. Therefore, the actual form of the core axial shape (e.g., cosine, saddle, or flattened cosine) is not necessarily important. What is important is how well the CPC calculated axial shape matches the actual core axial shape. The axial shape calculated by the CPCs using the generic cycle-independent SAM will look more like the core axial shape throughout the cycle than the axial shape calculated by the CPCs using the beginning of cycle (BOC) SAM. Presently, SAM is measured only once during reload startup and used throughout the cycle. The RMS (root mean square) error between predicted and measured axial power distribution increases during the cycle indicating that the representation is less accurate as the cycle progresses. The generic cycle-independent SAM will be based on MOC data. Comparative evaluations of generic cycle-independent SAM, with plant data from earlier and current cycles, indicate that the RMS error is smaller and more constant throughout the entire cycle with the generic cycle-independent SAM than with the BOC measured SAM. Additionally, the evaluations performed indicate that a SAM optimized for a particular reactor design will perform well for all equivalent units and cycles with equivalent fuel management subject to adjustments for known changes. Therefore, one generic set of shape annealing matrix elements could be used in all three Units.

The use of a generic cycle-independent SAM and the periodic monitoring of CPC synthesized axial shapes will prevent a similar anomaly from occurring at PVNGS.

2. NRC Request:

How often will CPC synthesized axial shapes be monitored during each cycle to determine the acceptability of the CPC axial shape synthesis?

APS Response:

CPC synthesized axial shapes will be monitored at least quarterly during each cycle to determine the acceptability of the CPC axial shape synthesis.