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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  
 VAN BRUNT, E. E. Arizona Nuclear Power Project (formerly Arizona Public Serv  
 RECIP. NAME RECIPIENT AFFILIATION  
 KNIGHTON, G. W. PWR Project Directorate 7

SUBJECT: Submits info in response to 10CFR50.61, "Fracture Toughness  
 Requirements for Protection Against Pressurized Thermal  
 Shock Events." FSAR peak fluence predictions used to  
 calculate ref temp values.

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 TITLE: OR Submittal: Thermal Shock to Reactor Vessel

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Submits data for the purpose of determining the effect of the various factors on the yield of the crop. The data are collected from the various sources and are analyzed by the use of statistical methods. The results are then presented in the form of tables and graphs.

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## Arizona Nuclear Power Project

P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

Director of Nuclear Reactor Regulation

Attention: Mr. George W. Knighton, Deputy 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-46)

STN-50-530

Pressurized Thermal Shock

File: 86-056-026

- References: (1) 10 CFR 50.61 "Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events".  
(2) CEN-189, Appendix J, Evaluation of Pressurized Thermal Shock Effects for Palo Verde 1, 2, and 3, 1981

Dear Mr. Knighton:

This letter provides the response required by Reference (1) for Palo Verde Units 1, 2, and 3. Some of this information was previously submitted by Reference (2).

Since there are not yet any surveillance capsule evaluations or other direct measurements of vessel fluence rates for Palo Verde Units 1, 2, and 3, FSAR peak fluence predictions were used to calculate the required RT-PTS values. Calculations were also done with the FSAR fluence increased by a factor of two (2.0) to conservatively bound possible variations in fluence due to uncertainties in actual plant operations and fuel loading strategies. As a conservative simplification, the peak of the axial and azimuthal fluence profiles was used to calculate a conservative RT-PTS value.

The controlling material chemistry and initial (i.e., pre-irradiation) toughness properties of the reactor vessel beltline materials for each of the three Palo Verde units are provided in Table 1. In each case, the controlling materials are the base plate properties, not the welds. The highest copper-nickel combination is 0.07% Cu and 0.66% Ni in PVNGS Unit 1. Using the CESSAR-F maximum design fluence of  $3.15 \times 10^{19}$  n/cn<sup>2</sup> (E>1 MeV) at the inside surface of the reactor vessel and the RT-PTS prediction equation from 10 CFR 50.61 results in a projected shift of 54°F, and a projected RT-PTS of 132°F. If the actual fluence were a factor of two greater (i.e.,  $6.3 \times 10^{19}$  n/cn<sup>2</sup>) then the projected shift and RT-PTS would be 65°F and 143°F, respectively. These results conservatively bound calculations for PVNGS Units 2 and 3.

*Add:*

AD - D. CRUTCHFIELD (ltr only)  
EB (W. JOHNSTON)  
RSB (THOMAS)  
EICSB (PARR)  
FOB (W. REGAN)

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Mr. George W. Knighton  
Pressurized Thermal Shock  
ANPP-  
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As can be seen above, the RT-PTS values for PVNGS 1, 2, and 3 are projected to remain well below the 10 CFR 50.61 screening criterion of 270°F, even for twice the maximum design fluence. In accordance with the requirements of paragraph (b)(1) of 10 CFR 50.61, we will inform you if future changes in core loadings, surveillance measurements or other information indicate a significant change in the projected values.

We believe this satisfies the requirements of 10 CFR 50.61 for PVNGS 1, 2, and 3.

Very truly yours,

*E. E. Van Brunt, Jr.*  
E. E. Van Brunt, Jr.  
Executive Vice President  
Project Director

EEVB/WFQ/PNG/rw

cc: A. C. Gehr  
E. A. Licitra  
R. P. Zimmerman



JAN 23 1986

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DOCKET NO(S). 50-528  
Mr. E. E. Van Brunt, Jr.  
Executive Vice President  
Arizona Nuclear Power Project  
P. O. Box 52034  
Pheonix, Arizona 85072-2034

SUBJECT: ARIZONA PUBLIC SERVICE COMPANY - PALO VERDE  
NUCLEAR GENERATING STATION, UNIT 1

The following documents concerning our review of the subject facility are transmitted for your information.

- ☐ Notice of Receipt of Application, dated \_\_\_\_\_.
- ☐ Draft/Final Environmental Statment, dated \_\_\_\_\_.
- ☐ Notice of Availability of Draft/Final Environmental Statement, dated \_\_\_\_\_.
- ☐ Safety Evaluation Report, or Supplement No. \_\_\_\_\_, dated \_\_\_\_\_.
- ☐ Notice of Hearing on Application for Construction Permit, dated \_\_\_\_\_.
- ☐ Notice of Consideration of Issuance of Facility Operating License, dated \_\_\_\_\_.
- ☒ ~~Monthly~~ <sup>Bi-weekly</sup> Notice; Applications and Amendments to Operating Licenses Involving no Significant Hazards Considerations, dated 1/15/86 (See page 1883)
- ☐ Application and Safety Analysis Report, Volume \_\_\_\_\_.
- ☐ Amendment No. \_\_\_\_\_ to Application/SAR dated \_\_\_\_\_.
- ☐ Construction Permit No. CPPR- \_\_\_\_\_, Amendment No. \_\_\_\_\_ dated \_\_\_\_\_.
- ☐ Facility Operating License No. \_\_\_\_\_, Amendment No. \_\_\_\_\_, dated \_\_\_\_\_.
- ☐ Order Extending Construction Completion Date, dated \_\_\_\_\_.
- ☐ Other (Specify) \_\_\_\_\_

Office of Nuclear Reactor Regulation

Enclosures:  
As stated

cc: See next page

OFFICE➤	RBDJ						
SURNAME➤	JLee						
DATE➤	1/15/86						

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

Palo Verde

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