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AUTH. NAME AUTHOR AFFILIATION
 BAILEY, J.A. Arizona Public Service Co. (formerly Arizona Nuclear Power
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SUBJECT: Forwards responses to questions related to power uprate
 amend request, Suppl 1.

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Arizona Public Service Company

PALO VERDE NUCLEAR GENERATING STATION
P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

102-03687-JAB/AKK/GAM

May 1, 1996

JACK A. BAILEY
VICE PRESIDENT
ENGINEERING

U.S. Nuclear Regulatory Commission
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Reference: Letter No. 102-03578, dated January 5, 1996, from W. L. Stewart, Executive Vice President - Nuclear, APS, to USNRC, "Proposed Amendments to Facility Operating Licenses and to Technical Specifications and Various Bases, Related to Power Uprate"

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Responses to Questions Related to Power Uprate Amendment Request, Supplement 1

In the referenced letter, Arizona Public Service Company (APS) submitted to the NRC a request to amend the PVNGS Operating Licenses and Technical Specifications to increase the plants' rated thermal power (RTP) from 3800 megawatts thermal (Mwt) to 3876 Mwt. This letter is to confirm that all analyses to support operation at 3876 Mwt RTP for Unit 2 Cycle 7 and the remainder of Unit 3 Cycle 6 (mid-cycle implementation), as discussed in the referenced letter, have been completed, and that the associated Core Operating Limits Supervisory System (COLSS) and Core Protection Calculator (CPC) addressable constants have been prepared for implementation when the license amendment is approved. Also, as discussed in the referenced letter, the reload analyses and the associated COLSS/CPC addressable constants for future fuel cycles, including Unit 1 Cycle 7, will be prepared and implemented to support operation at 3876 Mwt RTP.

Enclosed with this letter are additional NRC Staff questions related to the proposed power uprate amendment, and corresponding APS responses.

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

Sincerely,

A handwritten signature in black ink, appearing to read "S. A. Bauer", with a large, stylized loop at the end.

JAB/AKK/GAM/rv
Enclosure

cc: L. J. Callan
K. E. Perkins
C. R. Thomas
K. E. Johnston
A. V. Godwin (ARRA)

ENCLOSURE

**NRC Questions and APS Responses Related to
Power Uprate Amendment Request**

1. The January 5, 1996 submittal (page 16) refers to a peak temperature in containment of 399°F which has not been justified in terms of EQ.

Response:

Section D.3.2 (page 16) of the January 5, 1996, amendment request submittal for the power uprate addressed a peak main steam support structure (MSSS) main steam line break (MSLB) temperature of 399°F for the 0% power case and 376°F for the 3876 Mwt case. These values were based on analyses that had an extremely conservative superheat model for the time period of steam generator tube uncover. Subsequent to the January 5, 1996, amendment request submittal, these calculations were revised to incorporate a new conservative, but more realistic, steam generator superheat model and to incorporate some additional building heat sinks identified during field walkdowns. The peak temperatures from the revised calculations are 383°F and 373°F for the 0% and 3876 Mwt power cases, respectively.

Upon obtaining the final temperature profiles for the two MSLBs in the MSSS, all equipment in the EQ Program in the MSSS was evaluated against both of the new profiles. Thus, equipment is qualified for the highest temperature (383°F) experienced in the MSSS during a MSLB. More details of this evaluation were provided in the answer to Question 10 of the April 19, 1996, submittal to NRC that provided responses to NRC questions.

Additionally:

- o The MSSS MSLB analysis did not assume any condensate re-evaporation. This is consistent with the guidance provided in NUREG-0588 for Category I plants.
- o The equipment -specific thermal lag analyses did not assume any condensate re-evaporation. These analyses were done in accordance with the guidance provided in NUREG-0588, Appendix B, item 2.
- o The Containment MSLB analyses did assume an 8% condensate re-evaporation in accordance with the current licensing basis.

2. The licensee takes credit for 8% re-evaporation in establishing the EQ envelope for a MSLB and makes reference to NUREG-0588 as justification. However, this methodology is listed for NUREG-0588 Cat. II plants and Palo Verde is a Cat. I plant. The licensee needs to address this issue in terms of NUREG-0588 Cat. I requirements.

Response:

The Palo Verde units were originally reviewed and approved by the NRC for the 8% re-evaporation rate as allowed by NUREG-0588. This is stated in Section 6.2.1.1 of the Safety Evaluation Report for Palo Verde Units 1, 2, and 3, NUREG-0857, dated November 1981. The re-analysis for 3876 Mwt RTP was performed using the same methodology which constitutes the current licensing basis.

3. The submittal needs to address the effect of the power uprate on gaseous, liquid and solid radiological waste as compared to the current licensing basis.

Response:

Section F (pages 51 and 52) of the January 5, 1996, amendment request addresses the effect of power uprate on radiological effluents. The following is an excerpt from that section.

APS reviewed the FES [Final Environmental Statement] and determined that this amendment request does not significantly increase any adverse environmental impact. The plant is not being modified in any way which would significantly increase or change the type of effluents currently produced. The 2% increase in RTP is within the 4100 Mwt design stretch power evaluated in the Final Environmental Statement - Construction Permit Stage (FES-CP). Thus the environmental effects as a result of the uprate are bounded by those previously evaluated during FES-CP phase.

Radiological releases are controlled in accordance with PVNGS Radiological Monitoring Program and the results periodically reported to the NRC. Design Basis Event radiological releases have been demonstrated in the safety analysis of this amendment to not significantly increase offsite exposure and remain within regulatory limits. The radiological exposure to plant workers is controlled under the PVNGS As Low As Reasonably Achievable (ALARA) Program and will not significantly change.

4. The licensee's submittal makes no reference to component cooling water. Whatever system serves this function needs to be discussed in the submittal.

Response:

The system which serves as an intermediate cooling loop between the ultimate heat sink and other systems is the essential cooling water system which is discussed in Section D.7.10 of the January 5, 1995, amendment request.

5. The licensee needs to explain (perhaps as a footnote) how secondary side power (3817 and 3899 Mwt) were arrived at. It would be expected that the pump heat input would be the same for each case, but evidently it is not.

Response:

Secondary side power is the sum of the core thermal power, pump power, pressurizer heater power, letdown energy loss, and charging energy gain. The 3817 Mwt value is the design value (i.e., the sum of 3800 Mwt core power and the design pump heat input of 17 Mwt). During initial startup testing, a heat balance was performed on the reactor coolant system to determine the net energy input from sources other than the core thermal power. The net energy input measured in Unit 2 was 23 Mwt. The net energy input was then added to the core thermal power to obtain secondary side power. The 3899 Mwt number is the actual value expected following power uprate (i.e., the sum of 3876 Mwt core power and the Unit 2 measured energy input of 23 Mwt from other sources including pump heat).

