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 KNIGHTON, G.W. Licensing Branch 3

SUBJECT: Forwards draft proposed FSAR changes reflecting requirements for condensate storage tank & atmospheric dump valve nitrogen accumulator. Changes also reflect intent to verify boron mixing under natural circulation.

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1980年，在“六五”计划期间，我国开始实行对外开放政策，逐步扩大对外贸易。这一时期，我国与苏联、东欧国家的贸易关系得到了显著改善，同时积极发展了与世界各国的贸易往来。随着改革开放政策的深入实施，我国的对外贸易规模迅速扩大，进出口总额持续增长。特别是加入世界贸易组织（WTO）后，我国进一步融入了全球经济体系，对外贸易的广度和深度都达到了前所未有的水平。当前，我国正致力于构建新发展格局，推动高质量发展，对外贸易作为连接国内国际两个市场的重要桥梁，将继续发挥关键作用。未来，我们将继续深化改革开放，优化营商环境，提升贸易便利化水平，为实现中华民族伟大复兴的中国梦贡献更大力量。

[illegible]

Figure 1 consists of 16 small, black-and-white photographs arranged in a 4x4 grid. Each photograph captures a different stage of chick development within an egg. The top-left image shows a very early stage with a small, dark spot. As the images progress from left to right and top to bottom, the embryo becomes more distinct, showing the formation of the yolk sac and the development of the head and body. The final images in the bottom-right corner show the chick fully formed and breaking through the eggshell, with its head and beak visible.

The image is a high-contrast, black and white scan of a document page. It appears to be a ledger or a form with a grid-like structure. The page is heavily degraded, showing significant noise and artifacts, including vertical lines and horizontal bands of black and white. The content is illegible due to the poor quality of the scan.

Arizona Public Service Company

ANPP-31493-EEVB/WFQ
December 17, 1984

Director of Nuclear Reactor Regulation
Mr. George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Natural Circulation Cooldown Testing
File: 84-056-026; G.1.01.10

References: (A) Letter from A. E. Scherer, C-E, to D. G. Eisenhut, NRC,
dated August 12, 1983 (LD-83-074).
(B) Letter from E. E. Van Brunt, Jr., APS, to G. W. Knighton,
NRC, dated August 7, 1984 (ANPP-30141).

Dear Mr. Knighton:

As discussed with Mr. E. A. Licitra of your staff, attached are draft proposed FSAR changes for your information. These changes are necessary to make FSAR Appendix 5A consistent with the analyses and commitments provided by references (A) and (B), respectively. Specifically the draft proposed FSAR changes reflect the requirements for the Condensate Storage Tank and the Atmospheric Dump Valve Nitrogen Accumulator with regard to Branch Technical Position RSB 5-1. The attached proposed changes also reflect APS' intent to verify adequate boron mixing under natural circulation conditions.

Please contact Mr. W. F. Quinn of my staff if you have any questions on this matter.

Very truly yours,

E. E. Van Brunt

E. E. Van Brunt, Jr.
APS Vice President
Nuclear Production
ANPP Project Director

EEVB/TFQ/mb
Attachment

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

8412200226 841217
PDR ADOCK 05000528
A PDR

Boo!
1/1

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, A. Carter Rogers, represent that I am Manager, Nuclear Engineering of Arizona Public Service Company, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents and that to the best of my knowledge and belief, the statements made therein are true.

A. Carter Rogers
A. Carter Rogers

Sworn to before me this 17 day December, 1984.

Dora E. Meador
Notary Public

My Commission Expires April 6, 1987
My Commission Expires:



INSERT A to Page 5A.14

4 hours at hot standby plus 6.5 hours of operation to reach cold shutdown under natural circulation conditions.

INSERT B to Page 5A-15

Testing will also be conducted to verify adequate boron mixing under natural circulation conditions and the ability to perform a natural circulation cooldown and a plant depressurization to shutdown cooling indicating conditions.^(a)

circulation conditions must be available to the operator. Summarize these procedures.

Question 4. Discuss the availability of the Seismic Category I auxiliary feedwater supply for at least 4 hours at hot shutdown plus cooldown to the RHR system cut-in based on longest time for the availability of only onsite or only offsite power and assuming a single failure. If this cannot be achieved, discuss the availability of an adequate alternate Seismic Category I water source.

Question 5. What provisions in natural circulation cool-down methods have been made to account for possible upper head void formation?

7 RESPONSE: The response will be provided on the CESSAR docket. Additional clarification is provided as follows:

1.a. PVNGS provides, as a backup to the instrument air system, safety grade nitrogen accumulators to operate the steam generator atmospheric dump valves (ADV's). The accumulators provide nitrogen supply for ^{10.5}~~8~~ hours of operation of these valves. (a) ^{INSERT A} One nitrogen accumulator is provided for each ADV.

A single failure will not result in loss of capability to vent the minimum required amount of steam necessary for decay heat removal and plant cooldown.

1.b. The response to NRC Question 440.9 discusses power lockout for the safety injection tank (SIT) vent

7 a. Re-evaluation of the Nitrogen Accumulators to the ADVs, will be performed when the C-E Owners Group effort on NUREG-0737, Item II.K.2.17, Potential for Voiding in the Reactor Coolant System during transients, is completed.

and isolation valves. Additionally, power can be restored to the SIT vent valves from the control room to depressurize the SITs. Each SIT can be isolated or vented from the control room. There is no single failure which could result in the opening of all SIT isolation valves or could preclude RCS depressurization.

- 1.c. As stated in section 9.3.4.1, the charging pumps are not automatically sequenced onto the emergency buses. The charging pumps can be loaded onto the emergency buses from the control room.
2. RHR pressure relief discharge piping is provided with a sparger that is located at the bottom of the containment emergency sump. On that basis, no direct steam flow would be directed toward any personnel.
3. Cooldown under natural circulation conditions was analytically modeled and positively confirmed following two events at an operating C-E reactor plant. St. Lucie Unit 1 (Docket No. 50-335) performed two natural circulation cooldowns following a reactor trip from full power conditions in 1977 and in 1980. A test to verify natural circulation for System 80 is scheduled to be conducted as part of the power ascension testing. ~~See Chapter 14 of CESSAR FSAR for test details.~~ *INSERT B*

San Onofre Unit 2 is scheduled to conduct a boron mixing test during their upcoming power ascension testing. Since the boron mixing in the RCS is accomplished in a similar environment and by the same process, the San Onofre natural circulation flow boron mixing test results are considered prototypical for the System 80 standard design. Following completion of the San Onofre test, the results will be assessed for the applicability to System 80.

(a) Letter from E. E. Van Brunt, Jr., APS, to G. W. Knighton, NRC, dated August 7, 1984, (ANPP-30141), provided a description of the PVNGS Natural Circulation Test Program.

APPENDIX 5A

Specific natural circulation and natural circulation cooldown operator guidelines have been prepared by C-E for the C-E Owners Group. These guidelines were transmitted in CEN-152 to the NRC for review (June, 1981). These guidelines provide instruction to avoid void formation in the reactor vessel upper head that could occur during natural circulation conditions. Also included are instructions that deal with the symptoms and follow-up actions for a condensable reactor vessel void if one should occur.

4. The condensate storage tank (CST) is discussed in section 9.2.6. The tank is designed to provide sufficient auxiliary feedwater supply for 8 hours at hot standby, ~~including cooldown to RHR initiation of 350F~~^(b).

A single failure will not result in loss of water supply such that cooling to RHR initiation cannot be achieved. Pumps, valves, and piping required for essential operation are redundant, separated, and protected from adverse environmental effects.

plus 6.5 hours of operation to reach cold shutdown under natural circulation conditions.

83-074

b. LD-82-078, Letter from A. E. Scherer, C-E, to D. G. Eisenhut, NRC, dated ~~September 8, 1982~~^{August 12, 1983}, provided a REVISED Report on Natural Circulation Cooldown of CE System 80 NSSS. This report verifies the CST design is adequate.

5-27-68
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