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AUTH.NAME AUTHOR AFFILIATION
VAN BRUNT,E.E. Arizona Public Service Co.
RECIP.NAME RECIPIENT AFFILIATION
KNIGHTON,G. Licensing Branch 3

SUBJECT: Forwards response to 830617 request for addl info re FSAR Section 7.A.4 concerning multiple control sys failure.

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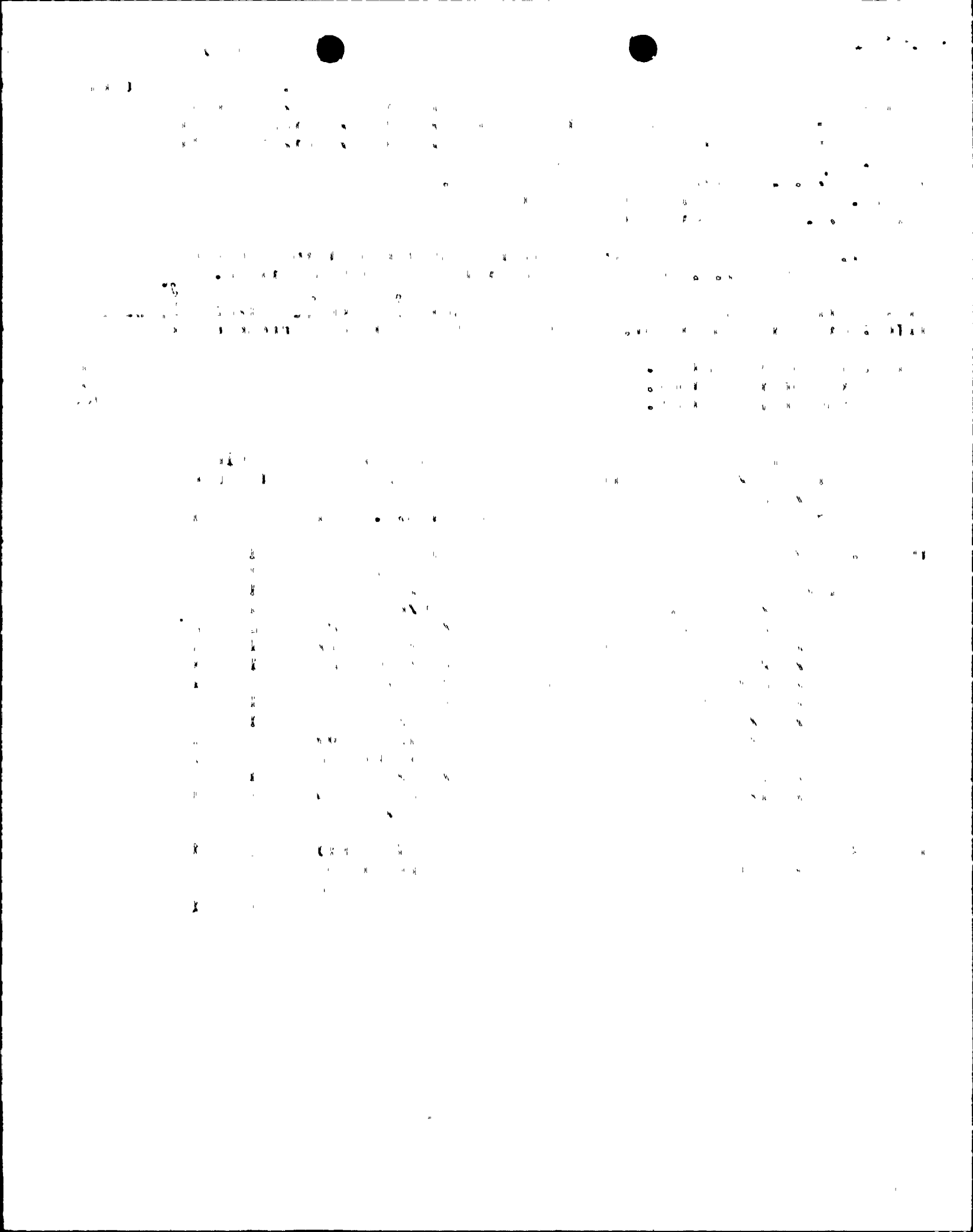


Arizona Public Service Company
P.O. BOX 21666 • PHOENIX, ARIZONA 85036

July 25, 1983
ANPP-27402 - WFQ/MSN

Director of Nuclear Reactor Regulation
Attention: Mr. George 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
File: 83-056-026; G.1.01.10

Reference: NRC letter from G. W. Knighton to E. E. Van Brunt, Jr., APS, dated June 17, 1983. Subject: Request for Additional Information - Palo Verde, Units 1, 2 and 3.

Dear Mr. Knighton:

Final Safety Analysis Report (FSAR), Section 7.A.4, provided our response to Question 222.04 concerning multiple control system failures. The referenced letter requested additional information. Attached is the additional quantitative analysis requested.

If you have any further questions, please contact me.

Very truly yours,

E. E. Van Brunt

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

EEVB/MSN/sp
Attachment

cc: E. A. Licitra (w/a)
A. C. Gehr "
T. G. Woods "

B001
1/1

July 25, 1983
ANPP-27402 - WFQ/MSN

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Edwin E. Van Brunt, Jr., represent that I am Vice President Nuclear Projects of Arizona Public Service Company, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority so to do, 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.

Edwin E. Van Brunt

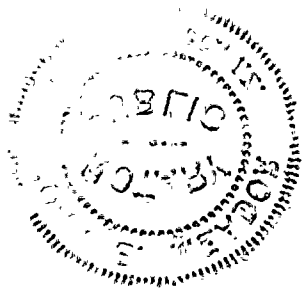
Edwin E. Van Brunt, Jr.

Sworn to before me this 25th day of July, 1983.

Notary Public

My Commission expires:

My Commission Expires April 6, 1987



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ATTACHMENT

PALO VERDE NUCLEAR GENERATING STATION
MULTIPLE CONTROL SYSTEM FAILURES
REQUEST FOR ADDITIONAL INFORMATION

QUESTION

By letter dated December 30, 1982, you provided information concerning multiple control system failures due to common power sources, common sensor or common instrument tap failures. With one exception, these transient scenarios are bounded by the Chapter 15 analyses included in the Palo Verde FSAR.

For the exception, i.e., of failure of the E-NNN-D11 panel, you state that although this scenario is not bounded by the loss-of-feedwater event analyzed in Chapter 15 (since the event did not include consideration of letdown isolation), the rate of RCS inventory addition is small and will not appreciably affect the peak RCS pressure or fuel performance aspects of this event. In addition, you state that sufficient time exists for the operator to take action to prevent the pressurizer from filling.

We request that you provide a more quantitative analysis to support your conclusions relating to the failure of the E-NNN-D11 panel.

RESPONSE

The failure of distribution panel E-NNN-D11 will initiate a decrease in feedwater flow at the time the distribution panel loses power. In addition, the PLCS will reduce letdown flow to 0 gpm, and initiate charging flow from all three charging pumps, resulting in a net mass addition to the primary system. The SBCS and RPCS will be unable to automatically respond to any challenges.

This event scenario is bound by the loss of feedwater flow event qualitatively presented in Section 15.2.7 of the CESSAR FSAR with respect to peak RCS pressure and fuel performance. The loss of feedwater flow event is bound by the loss of condenser vacuum event which results in a rapid reactor trip. Following the reactor trip the pressurizer level decreases to approximately its initial value. The time dependent level increase caused by all three charging pumps turning on and remaining on and the letdown line isolating is calculated and added to the intitial volume to determine the time by which the operator must act to prevent the safety valve inlet nozzle from being covered. In the same manner, the pre-trip pressurizer level increase due to the panel failure is calculated and added to the maximum transient pressurizer level.

The calculation of the pressurizer level swell used the following assumptions:

1) The maximum initial pressurizer liquid level is 60%
2) Each charging pump operates at 44 gpm
3) The letdown is completely isolated due to the panel failure
4) The charging flow is heated to RCS temperatures

Using this data it can be calculated that the operator has at least 20 minutes to take action before the safety valve nozzles are submerged. This is the same operator action response time used to set the initial pressurizer level technical specifications. This calculation is conservative in that the RCS temperatures, and hence pressurizer level, are assumed to attain post trip values approximately equal to their initial values as predicted by the LOCV event. The panel failure event will not result in the reactor coolant pump coastdown assumed in the LOCV event and therefore, will experience better heat transfer and a lower post-trip pressurizer liquid level. The reduced post-trip pressurizer level will result in additional margin for operator action.

The mass addition prior to reactor trip (approximately one minute) does not significantly increase the maximum pressurizer level (less than 30 $ft.^3$) and will not affect maximum RCS pressure. CESSAR FSAR figure 15B-5 illustrates this insensitivity of maximum RCS pressure to pre-trip RCS mass addition (analogous to an increase in the initial pressurizer water volume).