REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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FACIL:STN-50-528 Palo Verde Nuclear Station, Unit 1, Arizona Publi 05000528
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 Public Service Co.
RECIP.NAME RECIPIENT AFFILIATION
KNIGHTON,G. Licensing Branch 3

SUBJECT: Forwards revised FSAR pages reflecting max expected grid voltage of 102.5%,per 841026 telcon.Addl info re overvoltage conditions after setting Class 1E load ctr taps submitted. Issue closed.

DISTRIBUTION CODE: B001D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 6
TITLE: Licensing Submittal: PSAR/FSAR Amdts & Related Correspondence

NOTES:Standardized plant. 05000528
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	ELD/HDS3		1	0	IE FILE		1	1
	IE/DEPER/EPB	36	1	1	IE/DEPER/IRB	35	1	1
	IE/DQASIP/QAB	21	1	1	NRR ROE,M.L		1	1
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	NRR/DL/SSPB		1	0	NRR/DSI/AEB	26	1	1
	NRR/DSI/ASB		1	1	NRR/DSI/CPB	10	1	1
	NRR/DSI/CSB	09	1	1	NRR/DSI/ICSB	16	1	1
	NRR/DSI/METB	12	1	1	NRR/DSI/PSB	19	1	1
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	REG FILE	04	1	1	RGN5		3	3
	RM/DDAMI/MIB		1	0				
EXTERNAL:	BNL(AMDTS ONLY)		1	1	DMB/DSS (AMDTS)		1	1
	FEMA-REP DIV	39	1	1	LPDR	03	1	1
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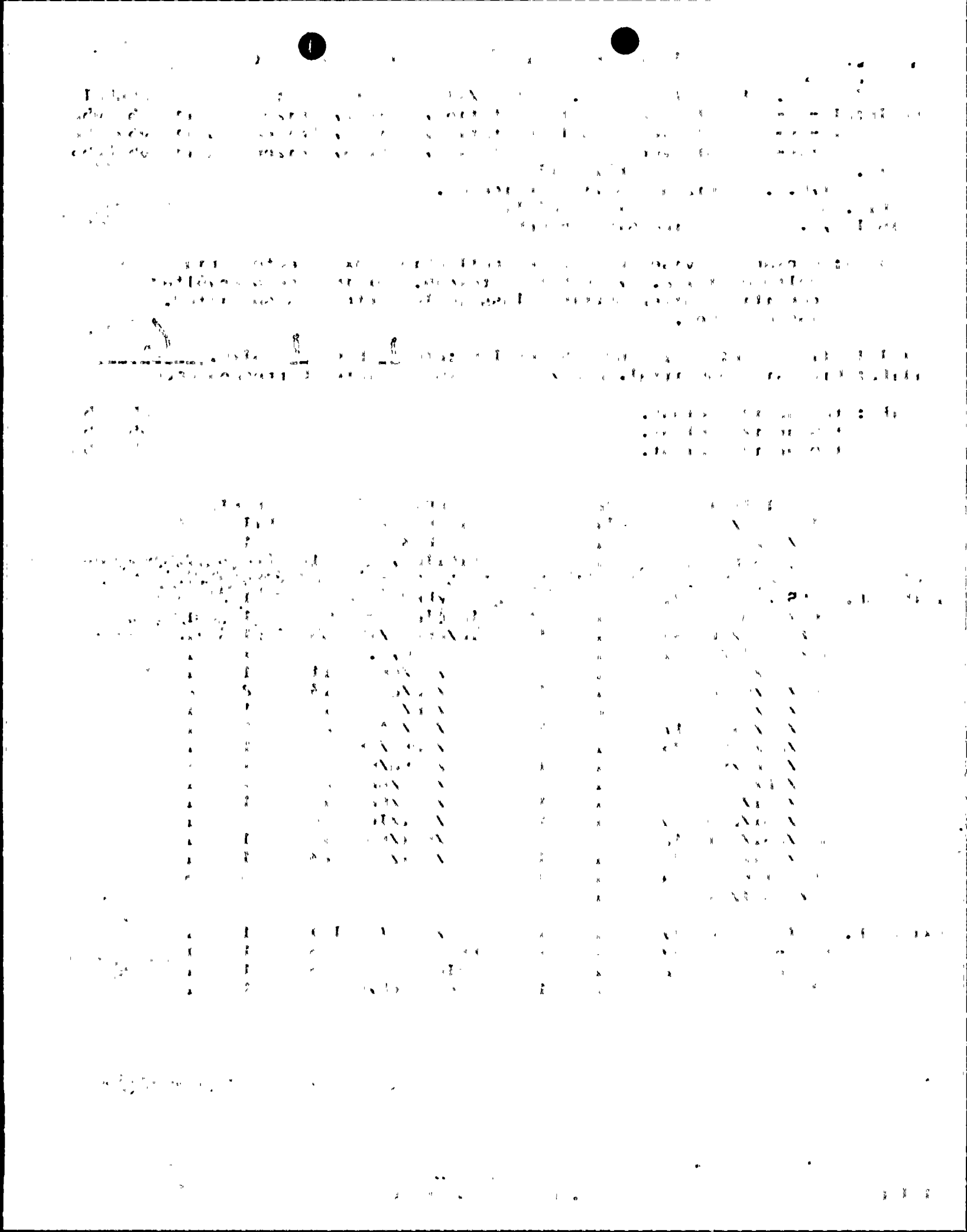

Arizona Public Service Company

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

November 29, 1984
ANPP-31244 TFQ/MAJ

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

References: (1) Telecon between E.Licitra, O.Chopra, NRC, and J.Barrow, M.Raines and M.Jones, APS, dated October 26, 1984, Subject: Overvoltage.

(2) Letter to G.W. Knighton, NRC, from E.E. Van Brunt, Jr., APS, dated September 4, 1984 (ANPP-30422), Subject: Response to Overvoltage Questions.

(3) Letter to G.W. Knighton, NRC, from E.E. Van Brunt, Jr., APS, dated July 6, 1984 (ANPP-29892), Subject: Justification for Changes to FSAR 8A.16, Overvoltage.

Dear Mr. Knighton:

The Reference (1) telecon was held to discuss staff questions concerning References (2) and (3). Per the referenced telecon, APS agreed to change the response to FSAR Question 8A.16 to reflect the maximum expected grid voltage of 102.5% (Reference 2). The 102.5% value represents the expected worst case steady state overvoltage. Attached is the revised FSAR page reflecting the acceptable 102.5% overvoltage.

Additionally, the staff requested information concerning overvoltage conditions after setting of the Class IE load center taps. In Reference (3), Attachment B, Item 3, APS discussed the criteria for setting the Class IE load center taps. This criteria eliminates any electric equipment from being energized and operated in excess of the continuous ratings under expected switchyard voltages. This criteria is also applicable to the ESF transformer taps in lieu of or in addition to the load center taps to provide ease of operation and flexibility in tap setting.

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1/1

The PVNGS preventative maintenance task, numbers 029409 and 029417, for checking bus voltages and changing taps prior to initiation of refueling and plant operation activities will assure this criteria is met. Once the taps have been checked and set, if required, plant overvoltage conditions will not exist.

It is our understanding that by submittal of this information, we have sufficiently addressed all of the staff's concerns relating to overvoltage conditions and have closed the issue out.

Very truly yours,

EEVanBrunt/DBC

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

EEVBJr/MAJ/no
Attachment

cc: E.A. Licitra w/a
O. Chopra w/a
A.C. Gehr w/a
R.P. Zimmerman w/a

November 29, 1984
ANPP-31244

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Donald B. Karner, represent that I am Assistant Vice President, Nuclear Production 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.

Donald B. Karner

Sworn to before me this 29th day of November, 1984.

Dora E. Meador
Notary Public

My Commission Expires:
My Commission Expires April 6, 1987

6 RESPONSE: PVNGS will measure the station distribution
12 buses including Class IE buses unloaded and record voltages. PVNGS will also measure and record the station distribution buses including Class IE buses upon loading the bus to at least 30%. This will occur prior to start-up.

PVNGS will measure and record grid and Class IE bus voltages and bus loading during the start-up of a large Class IE motor and also during the starting of a large non-Class IE motor.

The above information will be reviewed to verify analytic data.

6

QUESTION 8A.16 (Letter from R. L. Tedesco of June 17, 1981 on AC Power)

Part 1

Provide the time delay settings for the two 4160 volt safety related bus undervoltage relays.

RESPONSE: The Palo Verde design has four 4160 volt safety related bus induction disc undervoltage relays, and four instantaneous undervoltage relays with associated time delay relays. The induction disc relays have a dropout voltage that varies with time, so that they will commence time out if the voltage falls below 78% for a long time or below about 70% for a short time (11.4 sec or less) at time
12 dial setting of 4 and a tap block setting of 93 volts. The parallel instantaneous undervoltage relays will commence timeout of the series connected time delay relays when the bus voltage drops to less than 90% of design in a maximum of 35 seconds. Recovery of the bus voltage before timeout is completed will reset the time delay relays for the full 35 seconds.

Part 2

Submit the following information: the voltage levels at the safety-related buses optimized for the maximum and minimum load conditions that are expected throughout the anticipated range of voltage variations of the off-site power sources by appropriate adjustment of the voltage tap settings of the intervening transformers. The tap settings selected should be based on an analysis of the voltage at the terminals of the Class IE loads. The analyses performed to determine minimum operating voltages should typically consider maximum unit steady state and transient loads for events such as a unit trip, loss of coolant accident, startup or shutdown; with the off-site power supply (grid) at minimum anticipated voltage and only the off-site source being considered available. Maximum voltages should be analyzed with the off-site power supply (grid) at maximum expected voltage concurrent with minimum unit loads (e.g. cold shutdown, refueling). A separate set of the above analyses should be performed for each available connection to the off-site power supply. 6

RESPONSE: The maximum load condition at the minimum anticipated off-site voltage was considered when 1) winding "Z" of a start-up transformer was feeding normal running load of Unit 1 and train B of Unit 3 was supplying accident loads associated with a LOCA, and 2) the "Y" winding of the same startup transformer was supplying normal train ESF loads of Unit 2 under trip conditions. The analysis indicated the following worst-case Class IE voltage per unit levels at 95% of switchyard voltage: 12

	Bus Voltage	Motor Voltage
• 4.16KV Switchgear	0.8328	0.8662
• 480V Load Center	0.8303	0.8664
• 480V Motor Control Center	0.8269	0.8629

, with the ESF transformer taps adjusted for this condition;

APPENDIX 8A

The steady state per unit voltages with all normally running loads on Unit 1 while supplying one train of accident loads to Unit 3 and normal grid voltage (100%) in the switchyard are:

	Bus Voltage	Motor Voltage
• 4.16KV Switchgear	1.0108	1.0512
• 480V Load Center	1.0260	1.0707
• 480V Motor Control Center	1.0244	1.0689

12 The per unit voltages expected during situations of half load of Unit 1, with maximum grid voltage ~~(105%)~~ 102.5% and supplying one train of accident loads to Unit 3 are:

	Bus Voltage	Motor Voltage
• 4.16KV Switchgear	0.9981	1.0380
• 480V Load Center	1.0318	1.0896
• 480V Motor Control Center	1.0427	1.0880

QUESTION 8A.17 (Letter from R. L. Tedesco of June 17, 1981 on AC Power)

One of the CESSAR interface requirements is to provide 480 volt power supply to the six shutdown cooling isolation valves such that no single failure of power supply can open the valves to connect the reactor coolant system and shutdown cooling system inadvertently, nor can a single failure of power supply prevent opening all the valves of, at least, one section line during initiation of shutdown cooling. The Palo Verde design provides 6 480 volt power to four of these valves only. The other two valves are not included in Table 8.3.1 of the FSAR. This is unacceptable. Therefore, we require that the remaining valves be included in this table. In addition, the following additional information on this subject shall be provided for our review:

1. A description how the power supply to these valves meet the single failure criterion to prevent over-