

A subsidiary of Pinnacle West Capital Corporation

Palo Verde Nuclear Generating Station Dwight C. Mims Vice President Regulatory Affairs and Plant Improvement

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102-06222-DCM/RAB/DFH July 21, 2010

ATTN: Document Control Desk U.S. Nuclear Regulatory Commission Washington, DC 20555-0001

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2, and 3 Docket Nos. STN 50-528, 50-529 and 50-530 License No. NPF 41, NPF 51 and NPF 74 Licensee Event Report 2007-005-01

Attached, please find Licensee Event Report (LER) 50-528/2007-005-01, which supplements a previously reported condition prohibited by Technical Specifications due to an inadequate procedure for Surveillance Testing. This supplement is being submitted to report the results of the root cause analysis.

In accordance with 10 CFR 50.4, copies of this LER supplement are being forwarded to the NRC Regional Office, NRC Region IV and the Senior Resident Inspector. If you have questions regarding this submittal, please contact Ray Buzard, Section Leader, Regulatory Affairs, at (623) 393-5317.

Arizona Public Service Company makes no commitments in this letter.

Sincerely, Smul A. Josephine For D. C. MIMS

DCM/TNW/DFH/gat

Attachment

cc: E. E. Collins Jr. J. R. Hall

L. K. Gibson

R. I. Treadway

NRC Region IV Regional Administrator NRC NRR Senior Project Manager - (send electronic and paper) NRC NRR Project Manager NRC Senior Resident Inspector for PVNGS

A member of the **STARS** (Strategic Teaming and Resource Sharing) Alliance Callaway • Comanche Peak • Diablo Canyon • Palo Verde • South Texas Project • Wolf Creek

LEIL

	RM 366			U.S. NUCL	EAR RI	GULATO	RY COMMI	ISSION	APPROVE	D BY OMB:	NO. 3150-010	4	EXPIRES:	: 08/31/2010
-2007)									Estimated	burden per	response to c	comply with this	s mandate	ory collection
	•								licensing p	rocess and the Record	ed back to indu	stry. Send com	ments rega	arding burden
		LICEN	SEE E\	/ENT RE	POR	T (LER))		Nuclear Re e-mail to it	egulatory Co	mmission, Wasl	hington, DC 205	555-0001, er Office (or by internet
			•	•					and Regula Budget, W	atory Affairs,	NEOB-10202, (C 20503, If a	3150-0104), Off means used to	fice of Man	agement and n information
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Palo	Verdu	ME Nucle	ar Gen	erating S	tatior		S) Uni	t 1	2. DOCKI 05	000528	=R 3	. PAGE 1	OF 7	
TITLE	Voru			crating c	·		00) 011							
nade	quate	Surve	illance	Test Pr	oced	ure Re	sulted	in Fai	lure to	Meet S	Surveillan	ce Requi	remer	nt
5. E	VENT D	ATE	6. L	ER NUMBE	R	7. R	EPORT D	ATE		8.	OTHER FACI	LITIES INVO	LVED	
	DAY	YEAR	YEAR	SEQUENTIA	REV	MONTH	DAY	YEAR		GS Unit	2		DOCKET	NUMBER
				NUMBER					FACILITY		- ·.		DOCKET	NUMBER
08	21	2007	2007	- 005 -	01	07	21 [.]	2010	PVN	GS Unit	3		0500	0530
OPER	ATING	MODE	11.	THIS REPO	DRT IS	SUBMITTI			D THE RE		ENTS OF 10 C	CFR§: (Check	k all that	apply)
			20.22	201(b)		□ 2	0.2203(a))(3)(i)		50.73(a)	(2)(i)(C)	50.73	8(a)(2)(vii)
1	1/1/	1	20.22	201(d)			0.2203(a))(3)(ii)		50.73(a)	(2)(ii)(A)	50.73(a)(2)(viii)(A)		i)(A)
			\square 20.22	203(a)(1) 203(a)(2)(i)			0.2203(a) 0.36(c)(1))(4))(i)(A)	☐ 50.73(a)(2)(ii)(B) □ 50.73(a)(2)(iii)			☐ 50.73(a)(2)(viii)(B)		
D. POW	ER LE	/EL	20.22	203(a)(2)(ii)			50.36(c)(1))(ii)(A)		50.73(a)	(2)(iv)(A)	50.73	B(a)(2)(x)	
		•		203(a)(2)(iii) 203(a)(2)(iv)			50.36(c)(2)))(ii)		50.73(a)	(2)(v)(A) (2)(v)(B)		l(a)(4)	
100	/ 100	/ 100	20.22	203(a)(2)(v)			50.73(a)(2))(i)(A)		50.73(a)	(2)(V)(C)		ER	
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	NAME	Sectio	nlood	or Poqu	latory	Affaire			• •		TELE 622	PHONE NUMBEF	R (Include A)	rea Code)
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			13. COM			REPOR							REP	
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		14	. SUPPL	EMENTAL I	REPOR	I EXPECT	ED .			15. EX SUB	KPECTED MISSION	MONTH	DAY	YEAR
□ YE	S (If ye	s, complet	e 15. EXF	PECTED SU	BMISS	ION DATE)		NO		DATE		-	
3STRA	CT (Lin	nit to 1400	spaces, i	.e., approxii	nately 1	5 single-s	baced type	ewritten l	ines)		١		_	
On Au	ugust 2	1,2007,	with Pale	o Verde Ur	its 1; 2	2 and 3 in	Operatir ot Docior	ng Mode	1 (Pow	er Operat	ions), at app ilian, Ecodu	proximately 1	100 perc	ent
rateu	nnel de	etermine	that the	enormance existing S	urveilla	ance Test	Procedu	ures (ST	P) did n	ot verify th	nat Technica	aler (Al.) Sy I Specificati	on (TS)	lation
perso	eillance	Require	ment (SF	R) 3.3.5.4 v	vas me	t for certa	ain AF va	lves. T	S SR 3.3	3.5.4 requ	ires that the	Engineered	Safety	Feature
perso Surve	id not a	ie be ver account f	ified eve or full va	ry 18 mont Ive stroke	ns. Tr ime.	ie existing	j SIPS d	ia not in	cluge th	e respons	e times of co	ertain vaive	actuatio	n relays
persc Surve respo and d								•••••				De fei 41- e 84		· .
persc Surve respc and d		investiga ves (MSI	tion for (V) the F	extent of co eedwater	solatic	n identifie on Valves	d similar (FWIV) a	issues \ and the :	vith resp steam ac	onse time	e testing STF valves to the	-s for the Ma	ain Stea turbine	m driven
persc Surve respc and d Subse	equent	100 (1110)	lyoe wor	e assesse	and,	when the	expected	d additio	nal time	associate	ed with all re	lay actuation	ns and t	he full
surve respc and d Subse Isolat	equent ion Val 5. All af	fected va			al respo	onse time	did not e	exceed t	he TS S claring ti	R limits fo	or any of the	valves. Cor	ntrol Roc) m
persc Surve respc and d Subse Isolat pump valve	equent ion Val b. All af stroke	fected va were acc	counted	for, the tota	alah e	,	quicille		Samy t		or mer.			
persc Surve respc and d Subse Isolat pump valve perso	equent ion Val o. All af stroke onnel ei	fected va were acc intered TS	sounted is SR 3.0.	for, the tota .3 to allow	a delay									
persc Surve respc and d Subs Isolat pump valve perso	equent ion Val b. All af stroke onnel er cause o	fected va were acc ntered TS f this eve	s SR 3.0	for, the tota 3 to allow nadequate	a delay oversi	ght of TS	required	testing	where te	sting req	uirements ar	e satisfied b	by seque	ential or
persc Surve respc and d Subse Isolat pump valve perso . The c overla are m	equent ion Val 5. All af stroke onnel er cause c apping net thro	fected va were acc ntered TS f this eve STPs. S ugh the r	counted a S SR 3.0 Int was in TPs hav	for, the tota 3 to allow nadequate e been rev nce of mor	a delay oversi ised to e than	ght of TS test the a one test l	required actuation nas been	testing and burn conduct	where te ffer relay ted to e	sting required for the structure the structure of the str	uirements ar affected valv t the TS SRs	e satisfied b es. A revie were met.	w of TS	ential or SRs that
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persc Surve respc and c Subse Isolat pump valve persc The c overla are m There SRS V	equent tion Val b. All af stroke onnel er cause o apping net thro e have were m	fected va were acc ntered TS f this eve STPs. S ugh the p been two et.	previou	for, the tota 3 to allow nadequate e been rev nce of mor sly reporte	a delay oversi ised to e than d cond	ght of TS test the a one test l itions with	required actuation nas been nin the las	testing and bu conduct st three	where te ffer relay ted to en years wh	esting req rs for the nsure tha nere exist	uirements ar affected valv t the TS SRs ing STPs did	re satisfied b res. A review were met. d not verify t	by seque w of TS hat exis	ntial or SRs that ting TS

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1. FACILITY NAME	2. DOCKET	OCKET 6. LER NUMBER 3. P		3. PAGE	
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Unit 1		2007 -	005 -	- 01	2 OF 7

17. NARRATIVE

Note: All times listed in this event report are approximate and Mountain Standard Time (MST) unless otherwise indicated.

1. **REPORTING REQUIREMENT(S)**:

This LER (50-528/2007-005-01) is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) to report operation in a condition prohibited by Technical Specifications (TS). Specifically, TS Surveillance Requirement (SR) 3.3.5.4 requires verification every 18 months that Engineered Safety Features (ESF) response times are within limits. Contrary to this requirement, the existing surveillance test procedures (STP) did not verify that the TS SR for response time testing was met for certain Auxiliary Feedwater (AF) System valves (EIIS Code: BA), the Main Steam Isolation Valves (MSIV) (EIIS Code: SB), the Feedwater Isolation Valves (FWIV) (EIIS Code: SJ), and the AF pump steam admission valves.

2. DESCRIPTION OF STRUCTURE(S), SYSTEM(S) AND COMPONENT(S):

Equipment Description:

Valves identified within the scope of this condition are as follows:

- Eight AF System flow regulating and isolation valves for all three units: AFAHV0032, AFCHV0033, AFCUV0036, AFAUV0037, AFBHV0030, AFBHV0031, AFBUV0034, and AFBUV0035
- Four MSIVs for all three units: SGEUV0170, SGEUV0171, SGEUV0180, and SGEUV0181
- Four FWIVs for all three units: SGBUV0132, SGBUV0137, SGAUV0174, and SGAUV0177
- Four AF pump steam admission valves for all three units: SGAUV134, SGAUV138, SGAUV134A, and SGAUV138A

The AF regulating and isolation valves provide water to the Steam Generators (SG) upon receipt of an Auxiliary Feedwater Actuation System (AFAS) signal, and serve to isolate the AF system upon receipt of a SG differential pressure signal indicative of a ruptured SG. The AF valves also automatically cycle open and closed based on SG water levels after AFAS is initiated.

The AF system steam admission values supply steam to the turbine driven AF pump, which supplies feedwater to the SG.

The AF system provides an independent means of supplying feedwater to the SG during normal shutdown, startup, and emergency or accident conditions. The AF system functions to maintain water inventory for reactor decay heat removal during those phases of plant operation when the Main FW system is unavailable.

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The control circuitry for the AF valve AY to control automatic valve opera auxiliary feedwater actuation.	es and the st ation (open a	eam admission valves u nd closed) during events	ses relays AX and that require an					
The MSIVs isolate the Main Steam actuation signal in response to a Hi line break, a SG tube rupture, or a t	The MSIVs isolate the Main Steam (MS) System (EIIS Code: SB) upon receipt of an actuation signal in response to a High Energy Line Break (HELB) inside containment, a MS line break, a SG tube rupture, or a feedwater line break.							
The FWIVs isolate the Feedwater (actuation signal in response to a HI rupture, or a feedwater line break.	FW) System ELB inside co	(EIIS Code: SJ) upon re ontainment, a MS line bro	ceipt of an eak, a SG tube					
The control circuitry for the MSIVs a referred to as a buffer relay, to provide to a spurious actuation.	The control circuitry for the MSIVs and the FWIVs uses an isolation relay, commonly referred to as a buffer relay, to provide isolation from transient noise which could otherwise cause a spurious actuation.							
3. INITIAL PLANT CONDITION	3. INITIAL PLANT CONDITIONS:							
On August 21, 2007, Palo Verde U Operations), at approximately 100 inoperable that contributed to this c	On August 21, 2007, Palo Verde Units 1, 2 and 3 were in Operating Mode 1 (Power Operations), at approximately 100 percent power. No other components were inoperable that contributed to this condition.							
4. EVENT DESCRIPTION:	4. EVENT DESCRIPTION:							
On August 21, 2007, during perform of the AF system motor operated va existing STPs for the AF regulating TS SR 3.3.5.4, verification of ESF r time is:	On August 21, 2007, during performance of a Component Design Basis Review (CDBR) of the AF system motor operated valves (MOV), station personnel determined that the existing STPs for the AF regulating and isolation valves did not ensure compliance with TS SR 3.3.5.4, verification of ESF response time. The TS definition of ESF response time is:							
"The ENGINEERED SAFETY FEA from when the monitored paramete sensor until the ESF equipment is o valves travel to their required positi values, etc.)."	"The ENGINEERED SAFETY FEATURES RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.)."							
There were two separate issues ide ability to meet SR 3.3.5.4 as follows	entified which s:	impacted the existing te	est program's					
The complete circuit was no the valve circuitry were inclu-	t being prope Ided in the re	rly time tested in that no sponse time testing.	t all relays in					

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17. NARRATIVE On A abov ident these The of op comp met. As pa requi addit follow	The stroke time measurement hand switch initiation to rece open direction. Depending of can end prior to full travel of rugust 21, 2007, Control Room we for the AF regulating and iso tified that the AX relay was not e valves. Control Room person Shift Managers for all three unit berability for the identified valve obliance with the requirement to art of the extent of condition and ire ESF response time testing we tional components that were im-	nt used a tes ipt of valve p on the positio the valve. personnel w lation valves included in the nel entered its concluded es, and entered declare the halysis, a review was complete pacted by the	t method that measured the till osition indication, either in the n limit switch setting, the mea vere notified of the conditions r . At this time, station personn he STPs for response time tes the Operability Determination I that there was a reasonable a ed TS SR 3.0.3 to allow a dela limiting condition for operation we of components in each un ed. The analysis revealed the te two conditions identified abo	me from closed or sured time noted el had sting for process. assurance ay for (LCO) not it which following ove as				
•	On September 7, 2007, Con were not tested for the AF re- valves impacted by the two of the steam admission valves for all three units again conc operability for these addition On September 18, 2007, Co valves impacted by the two of the MSIVs and the FWIVs. MSIVs and FWIVs were not Managers for all three units assurance of operability for the TS SR 3.0.3 was entered for addition, at this time it was in been made on September 7 driven AF pump.	trol Room per egulating and conditions ide to the steam luded that the al componer ntrol Room p conditions ide The buffer re response tim again conclu- these addition these addition these addition these addition these addition	ersonnel were notified that the isolation valves, and that the entified above had increased t driven AF pump. The Shift M ere was a reasonable assurants. bersonnel were notified that the entified above had increased t lays in the actuation circuitry f he tested as part of any STP. ded that there was reasonable nal valves. dmission valves, MSIVs and F entry into TS SR 3.0.3 should e steam admission valves to t	AY relays scope of o include lanagers nee of e scope of o include or the The Shift WIVs. In I have he steam				
The	 Por the AF regulating and that the most limiting consistent of the seconds of receipt of the seconds of the second seconds of the second seconds of the second second seconds of the second seco	e based on th isolation val sideration for actuation sig	ne following information: ves, licensing basis document valve actuation is to close wit nal. The worst case for the lat	s establish hin 15 test response				
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 17. NARRATIVE time testing for any of these expected response time of travel time estimated to ad (660 milliseconds), yields within the limit of 15 seconds For the MSIVs, licensing the consideration is to close within the limit of 4.6 seconds. For the FWIVs, licensing the limit of 4.6 seconds. For the FWIVs, licensing the consideration is to close withe limit of 4.6 seconds. For the FWIVs, licensing the limit of 5.0 seconds which, when add (25 milliseconds), yields at the limit of 9.6 seconds which, when add (25 milliseconds), yields at the TS limit of 9.6 seconds 	se valves wa f the AY rela chieve closur a revised res nds. basis docume vithin 4.6 sec est response led to the exp revised response led to the exp st response led to the exp a revised response led to the exp a revised response	s 13.13 s y (180 m e followir sponse tir ents estal onds fror time test onds fror time test onds fror time test onds fror time test	econds whi illiseconds) ng receipt of me of 13.97 blish the mo n receipt of ting for any sponse time ting for any sponse time ting for any sponse time	ich, when and the action f the close seconds, ost limiting an actuati of the MS of the MS of the but conds, whi ost limiting an actuati of the FW e of the but econds, wh	added to the dditional d indication which is ion signal. IVs was 3.78 ffering relay ch is within IVs was 6.94 ffering relay nich is within
 For the steam admission documents establish the r within 10 seconds from re latest response time testin added to the expected res additional travel time estin indication (1.91 seconds), is within the limit of 10 seconds 	valves to the most limiting eceipt of an a ng for any of sponse time mated to com yields a revi conds.	steam di considera ctuation s the valve of the AX plete ope sed resp	riven AF pu ation is for t signal. The s was 7.62 relay (180 ening follow onse time c	mp, licens he valves worst cas seconds v millisecon ving receip of 9.71 sec	ing to open e for the vhich, when ds) and the t of the open onds, which
5. ASSESSMENT OF SAFETY	CONSEQU	ENCES:			
Risk assessments were performed as required by TS SR 3.0.3. These the components, the previous test actuation signals. The summation	to determine assessmen data for perfo of this asses	potentia ts consid prmance, sment is	I adverse ir ered the de and the tim as follows:	npact of th sign safet ing require	e conditions y functions of ements for
 For the AX and AY relays milliseconds. These relay "ESFAS Train A (/B) Subg For the buffering relays in 	, data indicat ys are functio group Relay i	es an ex nally test Functiona	pected resp ted, but not al Test." actuation ci	time teste	of 180 d, in the STP
data indicates an expecte	ed response t	ime of 25	5 millisecon	ds. These	relays are

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functionally tested, but no and Integrated Safeguard	t time tested s Test Train	, in the STP "Class 1E Diesel G A (/B)".	Senerator
 The additional time require the position indication indi 660 milliseconds for the A steam admission valves a 	ed for the val icates the va F regulating and negligible	lves to travel to their required p lve is at that position, was dete and isolation valves, 1.91 seco for the MSIVs and FWIVs.	oosition, after rmined to be onds for the
 When adding the addition travel time to the latest re- condition, the revised over 	al time for re sponse time rall response	lay response time and the addi testing for the valves affected b time for each of the valves is v	itional valve by this within limits.
 The risk assessments control to include the relays and a This conclusion was base 	cluded that tl additional val ed on two cor	here was no increased risk fror ve travel time in response time nsiderations:	n the failure testing.
 The valves passed relays were functio The maximum time could possibly add the required design significantly longer adversely impacted the design response 	their most re nal. that the related to the response than design d since the ac se time.	ecent functional SR tests to der ay response and additional valv nse time was not significant co me. Additionally, the risk critica response time; therefore risk w dditional time would not result i	monstrate the re travel mpared to al timing is vas not n exceeding
The event did not result in any chal release of radioactive materials. The implications as a result of this even operation of the plant or health and	llenges to the here were no it and the eve I safety of the	e fission product barriers or res adverse safety consequences ent did not adversely affect the e public.	ult in the s or safe
The event did not result in a transie Final Safety Evaluation Report Cha safety consequences or personnel	ent more seve apters 6 and safety impac	ere than those analyzed in the 15. The event did not have an ct.	updated y nuclear
The condition would not have preve structures or systems as defined by	ented the fulf y 10 CFR 50	fillment of any safety function o .73(a)(2)(v).	f
6. CAUSE OF THE CONDITIC)N:		
The direct cause of the failure to pe the affected MOV actuation circuitr	erform the ready was inaded	quired testing of the AX, AY an quate STPs which did not conta	nd buffer relays in ain steps to test

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17. NARRATIVE		· · · · · · · · · · · · · · · · · · ·	
the AX, AY and buffer relay response time testing.	se times as p	art of the overall compo	onent actuation
The root cause of the failure to ade components was inadequate oversi requirements were satisfied by sequ adequate hot functional testing was components. However, in the trans captured in the sequential or overla	quately perfo ight of the TS uential or ove performed to sition to opera pping tests.	rm the required testing required testing, where rlapping tests. Prior to o meet the TS SRs for t tional testing, not all TS	of the subject e testing initial plant startup, he subject S SRs were
7. CORRECTIVE ACTIONS:			
STPs have been revised to test the	AX, AY, and	buffer relays for the af	fected valves.
A review of TS SRs that are met the STPs did not identify any other issu	rough the pei ies with meet	formance of sequential ing the TS SRs.	or overlapping
The Component Engineering Group owner for all required surveillance to Programs Management and Health	o was assign ests as defin Reporting.	ed the responsibility to ed in procedure 73DP-0	act as the program)AP05, Engineering
Study 13-MS-C003 was conducted and provide an adjustment factor, if room indicating lights. An evaluation to determine if test changes are rec	to evaluate a f required, for on of the stud quired.	vailable stroke time tes static stroke time testin y results is being perfo	st data, design data ng using control rmed on each valve
8. PREVIOUS SIMILAR COND	DITIONS:		
LER 1-2007-004-00 reported a con TS SR to ensure the Containment S actions from the 004 LER could not the length of time the condition des	dition where Spray system t have prever cribed in the	existing STPs did not a headers were full of w ted the condition in the current LER has existe	dequately meet a ater. The corrective current LER due to d.
LER 1-2004-005-01 reported a con removal of required testing of Shute this event was personnel error durin revision. The corrective actions for the different nature of the cause.	dition where down Cooling ng performar that event w	a revision to existing S isolation valve interloc ce of the 10CFR 50.59 ould not have prevente	TPs resulted in ks. The cause of review for the STP d this event due to

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