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# REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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ACCESSION NBR:9001220206 DOC.DATE: 90/01/16 NOTARIZED: NO DOCKET # FACIL:50-275 Diablo Canyon Nuclear Power Plant, Unit 1, Pacific Ga 05000275 AUTH.NAME AUTHOR AFFILIATION GREBEL,T.L. Pacific Gas & Electric Co. SHIFFER,J.D. Pacific Gas & Electric Co. RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-015-00:on 891214,P-14 turbine trip ESF features signal due to personnel error. W/8

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**Pacific Gas and Electric Company** 

77 Beale Street San Francisco, CA 94105 415/972-7000 TWX 910-372-6587 James D. Shiffer Vice President Nuclear Power Generation

January 16, 1990

PG&E Letter No. DCL-90-014

U.S. Nuclear Regulatory Commission ATTN: Document Control Desk Washington, D.C. 20555

Re: Docket No. 50-275, OL-DPR-80 Diablo Canyon Unit 1 Licensee Event Report 1-89-015-00 P-14 Turbine Trip Engineered Safety Features Signal Due to Personnel Error

Gentlemen:

Pursuant to 10 CFR 50.73(a)(2)(iv), PG&E is submitting the enclosed Licensee Event Report (LER) regarding an inadvertent occurrence of a P-14 turbine trip engineered safety features signal during Unit 1 restart testing.

This event has in no way affected the public's health and safety.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,

J. D. Shiffer

cc: A. P. Hodgdon J. B. Martin M. M. Mendonca P. P. Narbut H. Rood CPUC Diablo Distribution INPO

Enclosure

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LICENSEE EVE	ENT REPORT (LER) TEXT CONTINU	U.S. NUCLEAR RE UATION APPROVED ( EXPIRES: 8/3	GULATORY COMMISSIO DMB NO 3150-0104 1/85
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I Plant Conditions		^	
Unit 1 was in Mode 1 (	Power Operation) at 7 percen	t power.	

# II. Description of Event

# A. Event:

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On December 14, 1989, at 0012 PST, a steam generator (SG)(TA) high-high level P-14 permissive (main turbine (TRB)(TA) trip, main feedwater turbine (TRB)(JB) trip and feedwater isolation valve (ISV)(JB) closure) occurred on Unit 1 during restart testing. A 4-hour, non-emergency report was made in accordance with 10 CFR 50.72(b)(2)(ii) at 0247 PST.

The digital feedwater level control system (DFWCS)(LC)(SJ) had been installed during the refueling outage. Testing of the main turbine trips was being performed per surveillance test procedure (STP) M-21A, "Main Turbine Functional Tests," with the reactor at 7 percent power and the DFWCS in automatic. The main turbine was manually tripped in accordance with STP M-21A. Following the trip, Operators observed main feedwater pump (MFP) 1-2 (P)(SJ) runback to 2300 rpm and rapidly decreasing SG levels. The Control Operator (CO) put the MFP individual controller into manual and increased the MFP speed to 100 percent, but no effect on MFP turbine speed was observed. The Assistant Control Operator (ACO) started the auxiliary feedwater pumps (AFP) (P)(SJ). Operators at the main turbine relatched the main turbine. The decreasing SG levels resulted in the main feedwater regulating valves automatically opening to approximately 45 percent.

The ACO noted that the "roll back min" annunciator was on at the MFP speed control station, indicating that the MFP turbine had run back the rpm to minimum; this was unusual and unexpected. The ACO was instructed to reset the alarm. On resetting the alarm, the MFP turbine rapidly accelerated to maximum speed, and SG levels began increasing rapidly. MFP speed was reduced on the individual controller to provide a differential pressure of approximately 60 psid. Bypass valves were put in manual and throttled to 30 percent. The AFPs were secured.

Due to the large quantity of feedwater added to the SGs, reactor coolant system (RCS) average loop temperature (Tavg) dropped to 522°F and Unit 1 entered the action statement of Technical Specification (TS) 3.1.1.4, "Minimum Temperature for Criticality." Operators pulled control rods to recover Tavg.

Feedwater flow remained too high, and operators reduced MFP speed to reduce differential pressure to 50 psid. Bypass valves were manually closed, but little effect on feedwater flow was observed. The main feedwater regulating valves were observed to be 45 percent open in automatic mode. Operators placed the controls in manual and closed the

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LICENSEE EVEN	T REPORT (LER) TEXT CONTINU	U.S. HUCLEAR RE UATION APPROVED EXPIRES: 8/3	OULATORY COMMISSION DMB NO 3150-0104 - 1/88
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valves. By this time, SG level was about 50 percent and increasing as the water heated up. Shortly thereafter, SG levels reached the P-14 trip (67 percent) and a P-14 alarm came in. Reactor power at this time was 6 percent. AFW pumps were manually restarted. Reactor power was lowered to 2 percent, and SG levels were allowed to return to normal. RCS Tavg was returned to 541°F, and Unit 1 exited the action statement of TS 3.1.1.4.

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Troubleshooting identified that the MFP turbine speed control circuitry (P)(JB) included a speed runback feature on main turbine trip, contrary to the applicable design documents.

The history of MFP turbine speed control system modifications was investigated. On December 27, 1985, design change package (DCP) J-33347 was issued to add a Lovejoy MFP speed control system (a Class II system) to Unit 1. This PG&E DCP included a feature that provided for a MFP turbine runback on main turbine trip. This DCP also contained a wiring error that made the MFP runback feature inoperable.

On January 22, 1986, DCP J-33461 was issued to provide an interlock to prevent load transient bypass (LTB) actuation following a main turbine trip. This DCP utilized a spare contact on relay PS-329X (RLY)(SJ), however the design had a wiring error that disabled the LTB feature.

During installation of the Lovejoy modifications, it was determined that the MFP turbine speed runback on main turbine trip was not desired. On June 24, 1986, Unit 1 Field Change (FC) E-9251 to DCP J-33347 was issued to spare out annunciator circuits and to remove the MFP runback input to the Lovejoy controller. However, when the FC was implemented in September 1986, the MFP runback deletion portion of the FC was not implemented.

On October 27, 1989, Unit 2 experienced a main turbine trip followed by a LTB. The LTB should have been prevented by the installation of DCP J-34461 (the Unit 2 version of the Unit 1 DCP J-33461). Investigation determined that both Unit 2 and Unit 1 were miswired. The LTB wiring in each Unit and the wiring error in Unit 1 were in DCP J-33347 and were corrected via DCP E-43660. However, in Unit 1 the correction of the DCP J-33347 wiring error unknowingly enabled the MFP turbine runback feature that had not been deleted because of the incomplete FC.

Therefore, on December 14, 1989, a MFP turbine runback occurred following a Unit 1 main turbine trip signal. A work order was issued to restore the the wiring to the correct design configuration. Investigation following this event determined that the event was caused by failure to fully implement FC E-9251.

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NRC Form 384A 19-831		LICENSEE EVENT REI	PORT (LER) TEXT CONTINU	ATION	NUCLEAR REGULATORY COMMISSION APPROVED OMB NO 3150-0104 EXPIRES- 8/31/88
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	Un col col	it 2 design documents uld exist. The Unit rrect.	were reviewed to deter 2 MFP speed controller	mine if a simi was determined	lar problem I to be wired
Β.	Ind Eve	operable Structures, ent:	Components, or Systems	that Contribut	ed to the
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с.	Dat	tes and Approximate T	imes for Major Occurren	ces:	
	1.	December 27, 1985:	DCP J-33347 issued for wiring design error.	work containe	ed a
	<b>2.</b>	June 24, 1986:	FC E-9251 issued again delete MFP turbine run	st DCP J-33347 back.	' to
	3.	September 24, 1986:	FC E-9251 not fully im	plemented.	
	4.	November 22, 1989:	DCP J-33347 wiring des DCP E-43660 and enable on main turbine trip w deleted by FC E-9251.	ign error corr s MFP turbine hich had not b	rected by runback peen
	5.	December 14, 1989 at 0002 PST:	Unit 1 MFP runback occ turbine trip during ST	urs following P.	manua]
	6.	December 14, 1989 at 0012 PST:	Event/discovery date. occurred when 2 or more percent.	A P-14 ESF si e SG levels ex	gnal ceed 67
	7.	December 14, 1989 at 0030 PST:	Unit 1 stabilized at 2	percent power	•
	8.	December 14, 1989 at 0247 PST:	A 4-hour, non-emergency made to the NRC.	y 10 CFR 50.72	report
D.	Oth	ner Systems or Seconda	ary Functions Affected:		
	Upc tur	on initiation of P-14 bines tripped and the	, the turbine stop valve e feedwater isolation va	es tripped, th alves closed.	e MFP During this

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NRC Form 306A 19-83)	LICENSEE EVENT REPORT (LER) TEXT C	ONTINU	JATIO	N	U.S.	APPROVED C EXPIRES: 8/3	NULATOR MB NO 1	11 COMM	15810N 4
FACILITY NAME (1)	DOCKET NUMBER (2)			LER NU	MBER (8)		1	-	
DIABLO C/	ANYON UNIT 1	275 IL_	VEAN 8 9	D	1 5		0 5	5 OF 0	1 <sup>6</sup>
TEXT IN more space is a	required, use additional MNC Form SOLA's) (17)		<u></u>	<u> </u>	I	l			
	event, reactor coolant Tavg dropped to 5 greater than 541°F within the Technical	522°F, Speci	but w ficati	as ri	ecove equir	red to ed 15 m	inute	25.	
E.	Method of Discovery:								
	Operators observed SG levels rapidly inc on the control board.	reasir	ng fol	lowed	d by	a P-14	alarn	n	
F.	Operator Actions:			4					
	<ol> <li>Appropriate operator actions were ta Plant procedures in response to the</li> </ol>	iken ir Plant	n acco trans	ordano ient	ce wi	th appl	icabl	e	
	<ul> <li>Operators stabilized the reactor at appropriate SG levels and reset the</li> </ul>	2 perc P-14 1	cent p interl	ower.	, res	tored			
G.	Safety System Responses:				I				
	A P-14 main turbine trip, main feedwater isolation valves closure signal occurred	• turbi I on hi	ines t igh-hi	rip a gh S(	and m G lev	ain fee els.	dwate	r	
III. <u>Cau</u>	<u>use of the Event</u>		-	-					
· A.	Immediate Cause:								
	The immediate cause of the excessive fee resetting of the MFP turbine runback con set in manual. The sudden increase in p with the main feedwater regulating valve automatic control and the bypass valves caused the rapid feed to the SGs.	dwater trol w umping s bein fully	• addi /ith t / capa Ig 45 open	tion he sp city, perce in ma	to ti beed o in o ent op inual	he SG wa control combina contro contro	as th ler tion I,	e	
В.	Root Cause:								
	Failure to completely implement FC E-925 remove the MFP runback input to the Love	l due joy co	to in introl	atten ler.	tion	to deta	ii1_t	0	
IV. <u>Ana</u>	lysis of the Event								
A.	Safety Analysis:								
	The P-14 high-high SG level protective in to prevent over-filling of the SGs. Thu public were not-adversely affected by th	nterlo s the is eve	ck fu healti nt.	nctio h and	ned a safe	s desig ty of t	ned he		
V. <u>Cor</u> i	rective Actions				<u>.</u>				
Α.	Immediate Corrective Actions:		,		*				
	<ol> <li>Operators stabilized the reactor at 2 appropriate SG levels and reset the 1</li> </ol>	2 perce P-14 1	ent po nterlo	ower, ock.	rest	ored			

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RC Form 3664 (83) 1			LICENSEE	EVEN	T REPO	RT (L	ER) TE	EXT (	CONT	INU	JATI	ON	}	L	I.S. NUC AP EXI	:LEAR RI PROVED MRES: 8/3	GULA' OMB N 11/85	TORY CON	MISSIO 104
ACILITY NAM	É (1)					DOCK	ET NUMB	ER (2)			Τ		LER N	UMBER	{8]			PAGE	33
DIABL	o cai	YON	UNIT 1			0	5   0	0   0	27 	5 1	8	9	0		<u>*'                                    </u>		0	6 0F	0 6
DCT (If more a	iace às req		additional NMC Form 385	451 (17)					<b>L</b>										
	Β.	Cor	rective Act	ions	to Pre	vent	Recu	ren	ce:										
		1.	Procedure Terminatio to require determinat procedure place the been ident	DCP-3 ns," inde ed or been incom ified	03, "W was re penden reter in eff plete and t	ire a visec t ver minat ect a imple he ir	ind Ca in 1 ifica ed. it the ementa istall	able 1986 Had e tin ation lation	Spli duri n whe the me th n of on co	ices ing enev cun rese FC	s, R nor ver rren E-9 ecte	epa ma elo t d i 25 d.	airs l pr ectr revi fica l wo	and rogra rica isio isio isio isio isio isio isio idi ould	d am e l ci n of ns w lik	nhand rcui this ere ely l	ceme try taki nave	ent is ing	
		2.	Briefings General Co importance complete, were revie future sim	have nstru of d prior wed t ilar	been h ction letaile to si o ensu event.	eld w to rev d rev gnoff re ac	vith E view view f of t lequat	lec thi: to en the t the c	trica s eve nsure work ontro	al a ent e th pla ols	and and nat an a are	1&(   r(   a]    s     i	C Ma eemp l wo fini n pl	int bhas ork she lace	enan ize item d. P to	ce al the s are roce prec	nd w e Jure Lude	/ith ≥s ≥ a	
		з.	The design event were of the des upgraded t revisions provide fo verificati	chan not ign e he En to th r a m on pr	ge erro the cal rrors gineer e Nucle ore the ocess.	ors i use c in 19 ing c ear E oroug	denti of the 185 ar lesigr Ingine Ingine	ifie e evo nd 19 n pro erio d ino	d dur ent. 986 c ocess ng Ma deper	ring Su Jeso san anua nder	g th ubse crib nd p al P nt r	e que ed roo roo ev	inve ent abc cedu cedu iew	esti to ove, ures ure : of	gati the PG& in 3.60 the	on of occur E has clud N wh desig	f th cren ing ich gn	115 1Ce	
VI.	<u>Addi</u>	tion	<u>al Informat</u>	<u>ion</u>															
	Α.	Fai	led Compone	nts:															
		Non	е.															•	
	Β.	Pre	vious LERs	on Si	milar I	Probl	ems:					,			•				
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