

Souinern California Edison Company

SAN ONOFRE NUCLEAR GENERATING STATION P. D. BOX 128 BAN CLEMENTE, CALIFORNIA 92674-0128

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March 4, 1991

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

Subject: Docket No. 50-361 Supplemental Report Licensee Event Report No. 91-001, Revision 1 San Onofre Nuclear Generating Station, Unit 2

Reference: Letter, R. W. Krieger (SCE) to USNRC Document Control Desk, dated February 25, 1991.

The referenced letter provided Licensee Event Report (LER) No. 91-001, for an occurrence involving the Fuel Handling Building Post Accident Cleanup System. The enclosed supplemental LER provides additional information concerning the event, causes, and corrective actions. Neither the health and safety of plant personnel or the public was affected by this occurrence.

If you require any additional information, please so advise.

Sincerely.

Enclosure: LER No. 91-001, Rev. 1

cc: C. W. Caldwell (USNRC Senior Resident Inspector, Units 1, 2 and 3)
J. B. Martin (Regional Administrator, USNRC Region V)
Institute of Nuclear Power Operations (INPO)

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Southern California Edison Company

SAN ONOFRE NUCLEAR GENERATING STATION

P. O. BOX 128

SAN CLEMENTE, CALIFORNIA 92674-0128

FL. W. KRIEGER STATION MANAGER

March 4, 1991

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							LICER	NSEE EVE	NT REP	ORT (LER)					
Facilit SAN ONO	y Name	CLEAR	GENERA	TING	STATION. U	NIT 2	18 mart 1. inwest					0 5 0	umber (2) 0 0 3 6		age (3) 0 7
FUEL MO	VEMENT	S PERF Y TECH	ORMED	WITH	IN THE SPEN IFICATIONS	T FUE	STOP	RAGE POO	. WITH	OUT C	ONCURRI	ENT OPERATION	OF POST AC	CIDENT	CLEAN	UP UNI
EVENT	DATE	(5)		LER	NUMBER (6),				REPOS	I DAT	E (7)	QTHER	FACILITIES	INVOLVE	0 (8)	
Month	Day	Year	Year	111	Number	111	Revis	Der M	onth	Duy	Year	Facility K	lames bo	cket Ni	mber(<u>s)</u>
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SUPPLEMENTAL REPORT EXPECTED (14)									Expected	Month	Day	Year				
Yes	(14 ye	s. cor	molete	EXPE	CTED SUBMIS	SION	DATE		NO				Submission Date (15)	1		

On 1/25/91, with Unit 2 at 100% power, during the performance of the Train "B" fuel handling building Post Accident Clean-up Unit (PACU) (E-371) monthly surveillance, the PACU inlet duct heater (E-465) was found to be "off", contrary to the surveillance requirements. Investigation revealed that the local pilot switch for E-465 was in the "off" position, de-energizing the heater. The pilot switch was turned "on", and the surveillance was re-initiated and completed satisfactorily.

Subsequently, it was determined that a previous E-371 monthly surveillance performed on 1/15/91 was incorrectly accepted as satisfactory since the completed surveillance procedure indicates that the heater was "off", contrary to procedural and Technical Specification (TS) requirements during the conduct of the test. Consequently, the operability requirements for PACU E-371 were not satisfied when movement of irradiated fuel in the Unit 2 Spent Fuel Pool occurred during the period of January 19 through 22, 1991 which resulted in violating the requirements of TS 3.9.12.

We have been unable to definitively determine the mechanism which resulted in mispositioning the heater pilot switch. The erroneous acceptance of the E-371 monthly surveillance performed on 1/15/91 is attributed to procedural deficiencies, inadequate knowledge level of PACU heater operation, and inadequate review of the surveillance test results by the personnel involved. Corrective actions include enhancing the PACU monthly surveillance procedure and reviewing this event with appropriate personnel.

SAN	ONOFRE 2	NUCLE	AR GE	NERATION STAT	10N	DOCKET NUMBER 05000361	LER NUMBER 91-001-01	PAGE 2 of 7
		Plant Unit: Reacto Event	: San Two or Ve Date	Onofre Nuclea ndor: Combus : 01-19-91	ar Genera tion Engi	ating Station neering		
	Α.	CONDI	TIONS	AT TIME OF TH	HE EVENT:			
		Mode:	1,	100% Power Ope	eration			
	Β.	BACKG	ROUND	INFORMATION:				
		1.	Fuel Syst	Handling Bui' em:	lding (FF	(B) Post-Accident	Cleanup Unit (PACU)	Filter
			Two Feat the acci thro char leve	PACUs [VG] are ures (ESF) [J] FHB [ND] and t dent will be r ugh High Effic coal adsorber 1s in the FHB	e provide E], to en the envir ninimized ciency Pa [ADS] to followin	ed, one per train sure that radioa conment as a resu 1. The PACUs rec articulate Air (H o reduce the part og the event.	of Engineered Safet ctive material relea lt of a fuel handlin irculate FHB atmosph EPA) filters [FLT] a iculate and iodine a	y sed in g ere nd a ctivity
			An e The the rela wate oper outs loca ener switf the the	lectrical coil purpose of the air entering i tive RH exceed r vapor which ation, the hea eillance testi ide of the cor lly mounted pi gization of th ch is not norm ormed on the f heater's main open position.	I duct he e heater the charc ds 70%, t reduces ater is c ing, the ntrol roo ilot togg he heater hally use heater, d remote c	ater is installe is to limit the cal adsorber to he charcoal abso the filter effic ontrolled by a 1 heater is operat m. The heater i le switch which control circuit d at San Onofre. e-energization i ircuit breaker a	d just upstream of t relative humidity (R less than 70%. If t rbs an excessive amo iency. During norma ocal RH switch. Dur ed remotely b, a han s also provided with provides for local d ; however, the pilot When maintenance i s accomplished by op nd tagging the break	he PACU. H) of he unt of 1 PACU ing dswitch a e- toggle s ening er in
		2.	PACU	Technical Spe	cificati	on (TS) Requirem	ents:	
			TS 3, Syste With Pool mach and mover surve once hours	/4.9.12, "Fuel em," Limiting one PACU inop (SFP) (locate ine over the S in operation. ment of fuel w eillance requi per 31 days b s with the hea	Handlin Conditio Derable, ed in the FP may p With no vithin th res the by verify sters on.	g Building Post- n for Operation fuel movement wi FHB) or operati roceed provided PACU operable, e SFP must be su PACUs to be demo ing that the sys	Accident Cleanup Fil (LCO) 3.9.12 requires thin the Spent Fuel S on of the fuel hand) the other PACU is ope all operations invol spended. TS 4.9.12 nstrated OPERABLE at tem operates for at	ter s that Storage ing erable ving least least 10

SAN ONOFRE NUCLEAR GENERATION STATION	DOCKET NUMBER	LER NUMBER	PAGE
UNIT 2	05000361	91-001-01	3 of 7

Administrative Controls:

The control room operators authorize work to be performed and are responsible for the accuracy and completeness of the surveillances performed by Operations. The PACU surveillance is normally performed by the Assistant Control Operator (ACO) and reviewed by both the Control Operator (CO) and Control Room Supervisor (CRS) (all are utility, licensed personnel).

C. DESCRIPTION OF THE EVENT:

1. Event:

On 1/25/91, during the performance of the Train "B" PACU (E-371) monthly surveillance, the licensed operator performing the surveillance test observed from control room indications that the inlet duct heater (E-465) was "off", contrary to the surveillance requirements. Investigation revealed that the locally mounted pilot toggle switch for E-465 was in the "off" position, de-energizing the heater. The heater was re-energized and the surveillance re-initiated and completed satisfactorily.

In SCE's subsequent investigation, it was determined that the E-371 monthly surveillance performed on 1/15/91 was incorrectly accepted as satisfactory since the completed surveillance procedure indicates that the heater was "off", contrary to the procedural and TS requirements during the conduct of the test. As a result of these occurrences, the operability requirements for E-371 were not satisfied when movement of irradiated fuel in the Unit 2 SFP occurred during the period of January 19 through 22, 1991. During this fuel movement, the Train "A" PACU was not in operation contrary to the action requirements of TS 3.9.12.

Work activities in the vicinity of E-465 occurred between 12/31/90 and 1/14/91. Although we have been unable to definitively determine the mechanism which resulted in mispositioning the pilot switch, it is believed to have occurred in this period.

 Inoperable Structures, Systems or Components that Contributed to the Event:

Not applicable.

3. Sequence of Events:

DATE ACTION

1/15/91 E-371 surveillance completed with heater E-465 "off", but was logged and reviewed as satisfactory, contrary to the surveillance requirements.

SAN ONOFR	E NUCLI	EAR GENERAT	ION STATION	DOCKET NUMBER \$5000361	LER NUMBER 91-001-01	PAGE 4 of 7				
1		DATE	ACTION							
		1/19/91	Commenced fu	el movement in Unit	2 SFP.					
		1/22/91	Secured fuel	movement in Unit 2	SFP.					
		1/25/91	Heater E-465 mispositione and the surv	was discovered de-e d pilot switch. The eillance was satisfa	nergized due to th heater was re-ene ctorily completed.	e rgized,				
	4.	Method of	Discovery:							
		During the operator p indication contrary t	e performance o performing the ns that inlet d to the surveill	f the E-371 monthly surveillance observe uct heater E-465 for ance requirements.	surveillance, the d from control roc PACU E-371 was "o	licensed m iff",				
	5.	Personnel Actions and Analysis of Actions:								
		Operation: determined "off" pos	s personnel pro d that the loca ition, and corr	motly initiated an in I'y mounted heater p ected the condition.	nvestigation which ilot switch was in	the				
	6.	Safety Sys	stem Responses:							
		Not applic	cable.							
D.	CAUSE	OF THE EVE	ENT :							
	1.	Pilot Swit	ch Misposition							
		SCE perfor which caus revealed t the outsid vicinity o investigat Control (R with E-371 cause of t the activi inadverten	rmed an extensive sed misposition that maintenance to of the PACU a of E-465 between tion, interviews RMC) personnel w . Although the he pilot switch ties may have a tly operated.	ve investigation to a ing of the pilot swit e support activities and associated duction in 12/31/90 and 1/14/9 s were conducted with who performed those we investigation did of mispositioning, it resulted in the pilot	establish the mech tch. The investig (e.g., de-contami ng) occurred in th 91. As part of th in the Radioactive work activities as not identify a def is possible that switch being	anism ation nating e Material sociated initive one of				
	2.	Surveillan	ce Procedure De	eficiencies:						
		The PACU m criteria f heater to at the end this appro factors st	onthly surveill or a satisfacto be "on" for the of the procedu ach did not pro andpoint, such	ance procedure conta bry test (including t e duration of the tes ire. We have conclud ovide sufficient cons that each required a	ined the acceptant he requirement for t) in one long ser ed from our review iderations from a cceptance criteric	the tence that human on was				

SAN ONOFRE UNIT 2	NUCLE	AR GENERATION STATION	DOCKET NUMBER 05000361	LER NUMBER 91-001-01	PAGE 5 of 7
		explicitly reviewed. This signed for satisfactory counsatisfactory) of the 1/ requirement in the accept during the conduct of the	s was evident by the ompletion (when in f 15/91 surveillance f ance criteria that t test.	fact that the AC act it was ailed to identify he heater must be	0 who the on
	3.	Inadequate Review of Surv	eillance Test Result	S :	
		Operations supervision (u (E-371) surveillance test acceptance criteria had no the supervision involved surveillance test results of PACU run time and PACU TS). Their review failed "cff".	tility, licensed) wh results failed to i ot been satisfied. indicated that durin . their attention wa flow rate (paramete to identify the fac	o reviewed the 1/ dentify that the Interviews conduc g the review of t s focused on calc rs which are gove t that the heater	15/91 ted with he ulation rned by was
	4.	Knowledge of PACU Heater	Operation:		
		The PACU heater has two me automatic. In manual, the operating. In automatic, cycles on when the RH of value of 70% and turns of	odes of operation, m e heater will be "on with the PACU opera the air entering the f when the RH decrea	anual (hand) and " as long as the ting, the PACU he PACU increases t ses below 70%.	PACU is ater o a
		The ACOs (utility, licensis surveillance on 1/15/91 d the PACU heater was "off" This was a result of proce above) and a lack of adequi operation. Had the operation more knowledgeable regard understood that the heater test and would have taken the heater.	ed) who performed th id not interpret as during the conduct edure deficiencies (uate knowledge regar tors performing the ing PACU heater oper r should have been o action to correct t	e E-371 monthly abnormal the fact of the surveilland as described in D ding PACU heater surveillance test ation, they would n during the surv he anomalous cond	that ce test. .? been have eillance ition of
Ε.	CORRE				
	1.	Corrective Actions Taken:			
		a. All appropriate pilo correct position.	ot switches have bee	n verified to be	in their
	^	b. The PACU surveilland identification that performance of the procedure was enhand sign-offs for each a for PACU operability	ce procedure was enh E-465 is required to surveillance. In ad- ced to clearly itemi acceptance criterion y.	anced to provide o o be "on" during d dition, the surve ze and provide set that must be sat	clear the illance parate isfied

SAN ONOFRE UNIT 2	NUCLE	AR GENE	RATION STATION	DOCKET NUMBER 05000361	LER NUMBER 91-001-01	PAGE 6 of 7			
	2.	Planned Corrective Actions:							
		a.	. SCE will evaluate performing modifications to the PACU heater (e.g., removal of the pilot toggle switch or installation of a cover over the pilot switch) which will prevent the pilot switch from being mispositioned in the future.						
		b.	Appropriate proced of the heater pilo	dures will be enhance ot switch (e.g., purp	d to include a di ose and location)	scussion			
		с.	Appropriate pilot the switch.	switches will be lab	eled to clearly i	dentify			
		d.	The Control Room for reviewed for pilot necessary changes incorporated as ap	Emergency Air Cleanup t switch applicabilit to the CREACUS surve ppropriate.	System (CREACUS) y. Based on this illance procedure	will be review, will be			
		e,	This event will be personnel, stress PACU system, and surveillance proce acceptance criter	e reviewed with appro ing: 1) the operabili 2) the importance of edures to verify that ia are satisfied.	priate Operations ity requirements f a detailed review t the surveillance	or the of			
		f.	Operator training effect of the duc CREACUS systems. operators as parc requalification t	will be enhanced to t heaters on the oper In addition, this ev of lessons learned raining.	clearly identify rability of the PA vent will be discu in their annual	the CU and issed with			
		g,	This event will b annual lessons le the importance of to avoid inadvert	e discussed with RMC arned training. The being careful when ently manipulating c	personnel as part discussion will i performing work ac omponents.	c of include ctivities			
F ,	SAFE	TY SIGN	IFICANCE OF THE EV	ENT:					
	This	event	is of little safet	y significance as de	scribed below:				
	The PACUs are designed to ensure that offsite radiation exposures and exposures to operating personnel in the control room resulting from postulated fuel handling accidents are within the guidelines of 10CFR100 and 10CFR50, Appendix A, General Design Criteria 19, respectively. The system performs this function by recirculating the air within the FHB through HEPA filters and charcoal adsorbers. An electrical duct heater is installed just upstream of the PACU. The purpose of the heater is to limit the RH of the air entering the PACU charcoal adsorber to less than 70% in order to ensure the design charcoal filter iodine removal efficiency of 95%. If the RH is greater than 70%, the charcoal absorbs an excessive amount of water vapor								

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The redundant PACU (Train "A") was fully operable during the time period of this event and capable of performing its design safety function had it been required. Notwithstanding this, the Updated Final Safety Analysis Report (UFSAR) indicated under Section 15.7.3.4, "Design Basis Fuel Handling Accidents," Table 15.7-6, "Radiological Consequences of a Postulated Fuel Handling Accident in the Fuel Building," that even without any PACU filtration, the resultant radiation doses at the Exclusion Area Boundary (EAB) and the Low Population Zone (LPZ) would still be well below the locFR100 limits. In addition, SCE has concluded that without any PACU filtration, the radiation doses to control room personnel would have been below the locFR50, Appendix A, General Design Criteria 19 limits. Therefore, operation without the PACU heater available remains bounded by the existing safety analysis.

G. FODITIONAL INFORMATION:

1. Component Failure Information:

Not applicable.

2. Previous LERs for Similar Events:

LER 90-013 (Docket No. 50-362) reported an incident involving the movement of irradiated fuel in the spent fuel pool with one PACU inoperable and the failure to place the operable PACU in operation. The cause was attributed to an operator's failure to correctly calculate the total PACU run time during the performance of the PACU monthly surveillance run. The error was not detected due to human factor deficiencies in the surveillance procedure and an inadequate review and approval of the completed surveillance. Corrective actions included an enhancement to the PACU monthly surveillance procedure. This corrective action failed to prevent recurrence due to limiting the scope to enhance only the portion of the procedure involving PACU run time.