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July 26, 1999

Re: Indian Point Unit No. 2 Docket No. 50-247 LER 98-009-01

Document Control Desk US Nuclear Regulatory Commission Mail Station PI-137 Washington, DC 20555

The attached Licensee Event Report 98-009-01 is hereby submitted in accordance with the requirements of 10 CFR 50.73.

Very truly yours,

## Attachment

cc: Mr. Hubert J. Miller Regional Administrator - Region I US Nuclear Regulatory Commission 475 Allendale Road King of Prussia, PA 19406

> Mr. Jefferey Harold, Project Manager Project Directorate I-1 Division of Reactor Projects I/II US Nuclear Regulatory Commission Mail Stop 14B-2 Washington, DC 20555

Senior Resident Inspector US Nuclear Regulatory Commission PO Box 38 Buchanan, NY 10511

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NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION							SSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/200							)/2001					
(0-1990)	LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)								Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management ann Budget, Washington, DC 20503. If an information collection does not displar a currently valid OMB control number, the NRC may not conduct or sponsor and a person is not required to respond to, the information collection.							mation ted into garding ), U.S. d to the int and display ponsor, n.				
FACILITY NAME (1)							DOCKET NUMBER (2) PAGE (3)													
Indian Point No. 2								05000-247					1	OF 6	i					
TITLE (4) Deficiencies Identified in Surveillance Procedures for Testing of Safety-Related Logic																				
EVE	NT D	ATE (5)		LER	NUMBER (	6)		REP	ORTD	ATE (7)		_			OTHER FAC	LITIES	NVOL	VED	(8)	
MONTH	DAY	YEAR	YEAR	SE	QUENTIAL	REVISIC NUMBE	R R	MONTH	DAY	YEA	R		FACILITY NAME			DOCKET NUMBER 05000				
06	24	1998	98		009	01		07	26	199	99		FACILITY NAME			DOCKET NUMBER 05000				
OPERA	TING	N		THIS	REPORT IS	SUBMI	Π	D PURS	JANT T	O THE	R	EQ	UIRE	MENT	S OF 10 CFR §	: (Chec	( one or more) (11)			
MODE	(9)		20.2201(b)			+	20.2203(a)(2)(v)			_	X 50.73(a)(2)(l)				50.73(a)(2)(viii)					
LEVEL	⊑ <del>N</del> (10)	000	20.2203(a)(1)			20.2203(a)(3)(l)				$\wedge$ 50.73(a)(2)(ii)				50.73(a)(2)(x)						
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			20.2203(a)(2)(iii) 50.3			50.36(c)(1)				50.73(a)(2)(v)						<b>n</b> 				
			20.2203(a)(2)(iv)				50.36(c)(2)					50.73(a)(2)(vii)				in NRC Form 366A				
						LICE	NS	EE CONT	ACT F	OR THIS	SI	LEI	R (12)	)						
NAME						-						TELEPHONE NUMBER (Include Area Code)								
James	J. M	aylath, Se	enior E	ngine	er		•						. (914) 734-5356							
			СОМ	PLETE	ONE LINE	FOR EA	СН	COMPO	NENT F	AILUR	EJ	DE	SCRI	BED IN	THIS REPOR	T (13)				
CAUS	=	SYSTEM	COMPO	DNENT	MANUFAC	TURER	RE	EPORTABL TO EPIX	E	CAUS	SE		SYSTEM COMPONENT MANUF		FACTURER REPO		REPORT TO E	TABLE PIX		
	SUPPLEMENTAL REPORT EXPECTED (14)										FYD	ECTED	MONTH	H D/	AY I	YEA	R			
YE! (If y	YES (If yes, complete EXPECTED SUBMISSION DATE).						SUBMISSION DATE (15)													
ABSTRA	ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)																			
On June 24, 1998 with the unit at cold shutdown, an ongine gring analyzic being not arrest in survey																				

On June 24, 1998, with the unit at cold shutdown, an engineering analysis being performed in support of design reviews identified that the feedwater isolation actuation logic surveillance test procedures did not individually test the four parallel auxiliary relay contacts that actuate feedwater isolation. On June 25, 1998, engineering analysis identified that surveillance test procedures did not test the turbine trip logic relay contact input to the Reactor Protection System. Following these discoveries, an extensive investigation of the plant surveillance test procedures was undertaken. This investigation identified other parallel relay contacts that are not individually tested. This investigation also identified the lack of verification of the following: a) an auxiliary relay associated with the low steam generator level logic input for starting the auxiliary feedwater pumps; b) automatic clearing of the low pressurizer pressure safety injection block; c) wiring between the intermediate range bistables and the reactor trip relays; d) reactor coolant pump breaker control circuitry for the underfrequency reactor trip. Except for c) and d), the applicable surveillance test procedures were revised and the required testing of the safety-related logic circuits was successfully performed in accordance with Generic Letter 96-01 prior to returning the unit to service following the 1998 maintenance outage.

The root causes of this event are: a) the lack of reevaluation of contractor work following the issuing of GL 96-01 and the subsequent workshop with the NRC and b) insufficient oversight of the contractor's first GL 96-01 review. Oversight responsibilities will be reinforced with cognizant personnel.

NRC FORM 366A (6-1998)		U.S.	NUCLEAF	RE	GULATOR	COMM	ISSION		
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION									
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Indian Point No. 2	05000-247	YEAR	SEQUE	EN	REVISI ON	2 0	F 6		
TEXT (If more space is required, use additional con		98	009		01				
		0000	-) (I <i>I</i> )						
PLANT AND SYSTEM IDENTIFICATION:						·			
Westinghouse 4-Loop Pressurized Water Reactor									
IDENTIFICATION OF OCCURRENCE:									
Deficiencies Identified in Surveillance Procedures for	or Testing of S	afety-Re	elated L	.ogi	с	•	·		
EVENT DATE:									
June 24, 1998									
REVISED REPORT DATE:	,		•		·				
July 26, 1999									
REFERENCES:									
Condition Identification and Tracking System (CITRS E06147, 98-E06209, 98-E06242, 98-E06303, 98-E0	S) Nos. 98-E0 6306, 98-E06	5426, 98 287 and	8-E054 98-E0	76, 642	98-E05 1	894, 9	8-		
Condition Reporting System (CRS) Nos. 199900403	and 1999004	59							
PAST SIMILAR OCCURRENCE:	. · ·	•							
None.									
DESCRIPTION OF OCCURRENCE:									
On June 24, 1998, with the unit at cold shutdown, an of design reviews identified a deficiency in the plant's feedwater isolation actuation logic surveillance test p auxiliary relay contacts that actuate feedwater isolati identified that surveillance test procedures did not te Reactor Protection System. Following these discover surveillance procedures was undertaken. On July 9, containment ventilation isolation actuation logic were surveillance test procedures. On July 19, 1998, this is the low pressurizer pressure safety injection block au	n engineering a s response to procedures did on. On June 2 st the turbine t ries, an extens 1998, parallel found to be n nvestigation id itomatically cle	analysis Generic not indi 5, 1998, rip logic sive inve auxiliary ot individ entified ears.	being p Letter vidually engine relay c stigatio relay dually t the lac	oerf (GL / te: eeri cont con este k of	formed .) 96-01 st the fo ng anal act inpu f the pla tacts in ed by th f verifica	in sup . The bur pa ysis ut to th ant the e exis ation t	port rallel ie iting nat		

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NRC FORM 366A (6-1998)		U.S. N	UCLEAR REG	ULATORY C	OMMISSION				
FACILITY NAME (1)	DOCKET (2)	<u> </u>	LER NUMBER	(6)	PAGE (3)				
		YEAR	SEQUENTIAL NUMBER	REVISION					
Indian Point No. 2	05000-247	1998	009	01	3 OF 6				
TEXT (If more space is required, use additional copies of NRC Form 366A)	(17)	u	<u></u>	<u></u>	<u>u</u>				
DESCRIPTION OF OCCURRENCE (con't.)									
On July 21, 1998, this investigation identified the lack of verification of actuation of an auxiliary relay associated with the low steam generator level logic input for starting the auxiliary feedwater pumps, and also identified parallel auxiliary relay contacts that are not individually tested in the 480V bus "blackout with safety injection" or "blackout with unit trip and no safety injection" logic. Further, independent verification of parallel contacts with the resulting operation of redundant solenoids from each of these was discovered to be lacking in the main steam isolation valve surveillance test. On July 24, 1998, this investigation identified incomplete wiring verification between the logic matrices and safety injection master relays in the monthly safeguards actuation logic test.									
ANALYSIS OF OCCURRENCE:									
GL 96-01 required a review and comparison of safe drawings and plant surveillance test procedures for adequate coverage of segments of the logic circuitr as necessary for complete testing to comply with Te reported as completed in a July 25, 1997 letter from Procedure Changes Resulting from Reviews Perfor Generic Letter 96-01: Testing of Safety-Related Log Description of Occurrence section above identify ac circuits that were not adequately covered in the sun Specifications (TS) as detailed in GL 96-01. These condition prohibited by TS and in an unanalyzed co 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(ii). T three months under the above conditions following to (resolution of testing deficiencies identified through the unit to service following the 1997 refueling outage	ety-related log Technical Sp y, and modific echnical Spec n Con Edison med in Accord gic Circuits." T dditional portic veillance proc test deficienci ndition, and th The plant oper the required ir GL 96-01 hac ge).	ic circui ecificat cation o ification to the N dance v che test ons of th edures es resu nis is re rated at npleme l been n	it electrical ion complia f surveillar ns. These a NRC, "Prop with Reque deficiencion to fulfill the lited in the portable un power for entation of required pr	schema ance and ace proce actions w osed Te sted Acti es listed elated log a Technic plant be nder approxin GL 96-01 ior to reti	tic dures rere st ion of in the gic cal ing in a nately urning				

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FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)				
Indian Point No. 2	05000-247	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 6				
		1998	009 01						
<b>TEXT</b> (If more space is required, use additional copies of NRC Form 366A)	(17)								
ANALYSIS OF OCCURRENCE (con't.):									
The GL 96-01 investigations identified 46 discrepant Some discrepancies involved drawing or procedure testing. Other discrepancies involved alarms and in attainment of the safety function with the untested of these cases, the tests were enhanced to include th and wiring.	ncies that reque variations an iternal redund components a e alarms and	uired ev d were ancies issumed internal	aluation a resolved v that did no d to be fail ly redunda	nd dispo vithout fu t impact ed. For n ant comp	sition. Irther the nost of onents				
Untested portions of the logic circuits, which could I Technical Specifications or adversely impacted the 1998 maintenance outage, were tested prior to return testing demonstrated that the logic circuits were full deficiencies identified after the July 1997 GL 96-01 the two items identified after September 1998 that of attainment of a safety function, operability determin plant shutdown of sufficient duration (up to the 2006)	have potential attainment of rning the unit ly operational. submittal had could potentia ations justified 0 refueling ou	lly resul a safet to servio As a re I minima Ily have d delayi tage).	ted in none y function, ce in Septe esult, the te al safety si had an in ng testing	complian found d ember 19 esting gnificand npact on until the	ce with uring the 998. This 298. For the next				
The operability determination for the underfrequency untested underfrequency relay contacts in the circu evidence of pitting. Actuation of the underfrequency parallel underfrequency relay contacts providing a t an RCP breaker trip on underfrequency is unlikely. electrical tests and mechanical inspections was per Observations that tripping the RCP breakers initiate Although these observations are undocumented, su computer in July 1997. The likelihood of an underfre Voltage would most likely drop before frequency. Un The direct undervoltage reactor trip is presently fully assumed to occur instantaneously, while the underf safety analysis and is a backup to the undervoltage reactor trip is blocked when the plant is at full power required at full power. The intermediate range moni design the block can be initiated above 10% power, an observation of the trip status lights indicated con reactor trip logic relays. The reactor trip was blocked at that power level. In the safety analysis, the interm the power range high flux, low level reactor trip whic significance of not testing the underfrequency and in shutdown of sufficient duration is minimal.	cy reactor trip it, which were y relays is pres rip input for ea Preventative r formed on the es a reactor trip uch an observe equency even ndervoltage w y tested. The u requency trip reactor trip. T r, and the unter tor reactor trip. T r, and the unter tor reactor trip. On April 1, 19 tinuity of the t d as designed hediate range ch is presently ntermediate reactor trip	included found t sently te ach RCI mainten four R p signal ation wa t on the ould pro occurs he inte ested po o is set a 999, wit fip path , since fully tes eactor tr	d an inspe o be clear ested quar P breaker, ance that CP breake have bee as displaye Con Edis ovide a dir ltage reac a few seco mediate r ortions of t at 25% pow h the unit from the t the bistabl reactor tr sted. Then ip until ne	ction of t with no terly. Wit failure to included ers in May n made. ed in the on grid is ect react tor trip is onds late ange mo he circui wer, and at 99% p oistables es were ip is a ba efore, the xt plant	he h two p initiate y 1997. plant remote or trip. r in the nitor t are not by power, to the tripped ickup to e safety				

NRC FORM 366A	· ·	U.S. NUCLEAR REGULATORY CO	MMISSION							
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION										
FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)	PAGE (3)							
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		1998 009 01								
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CAUSE OF OCCURRENCE:										
contractor from August to December of 1995, whic the NRC. The scope of this review was limited to th features electrical schematic drawings with support shedding, sequencing and undervoltage drawings. compared to these drawings to demonstrate wheth were adequately covered. Surveillance test proced included the monthly tests for the bistable output lo breakers. Surveillance test procedures reviewed fo monthly tests for the bistable output logic and the le tests for master and auxiliary relay actuation and va test procedures reviewed for the Blackout and Deg degraded voltage relay and auxiliary relay logic. Th interpretation of the NRC's draft of GL 96-01 which Register on May 22, 1995.	h was prior to he reactor prot ting emergence The plant sur- er or not the c ures reviewed ogic, the logic r ogic relay mat alve and moto raded Voltage is scope was was released	the formal release of GL 96 tection and engineered safe by diesel generator (EDG) lo veillance test procedures we circuits shown on these drave for the Reactor Protection relay matrices and the react red Safety Features include rices and the refueling inter r load sequence logic. Surve Logic included undervoltage based on Con Edison's initi by the NRC to the Federal	6-01 by bad ere wings System tor trip ed the val reillance ge and al							
written accounts of anomalies identified during the as well as test deficiencies. Con Edison reviewed th determined that several test procedure revisions ar compliance with GL 96-01 (as was reported in the GL 96-01 on January 10, 1996, and on March 19,1 concerning GL 96-01. On March 27, 1996 the NRC workshop, which included questions from the indus applicability and extent of scope of GL 96-01. Altho contractor's report, no reevaluation of the scope of issuing of GL 96-01 and the subsequent workshop. review after test deficiencies were identified in June	aries and ma review. The ai ne contractor's d one modific July 25, 1997 996 the NRC issued a lette try and answe ugh Con Edis the contractor The contractor e and July of 1	rked test procedures as we nomalies included editorial is report and from this report ation were required to achie letter to the NRC). The NRC held a workshop with the in er summarizing the GL 96-0 ers from the NRC on interpre on continued reviewing the d's review was done followin or was requested to reevalu 998.	II as issues t eve C issued dustry 1 etation, ig the iate its							
The root causes of the inadequate surveillance test	procedures a	re the following:								
<ul> <li>There was no effort by Con Edison to reeval 96-01 following the issuing of GL 96-01 and</li> <li>Con Edison oversight of the contractor's first</li> </ul>	uate the contra the subseque GL 96-01 rev	actor's work or compliance nt industry workshop. iew was insufficient.	with GL							
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NPC FCRM 366A (6-1998) LICENSEE EVENT TEXT CONT		U.S. N ER)	UCLEAR REG	ULATORY C	OMMISSION			
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TEXT (If more space is required, use additional copies of NRC Form 366A)	(17)			· · · ·				
CORRECTIVE ACTION:		•		•				
Following the discoveries of inadequately tested safety-related logic circuits in June 1998, an extensive investigation of safety-related logic circuit plant surveillance procedures was undertaken. This investigation included parallel logic and relay contacts, interlocks, bypasses, inhibit circuits, control switches and other contacts in the safety-related logic circuits. Untested portions of logic circuits, which could have potentially resulted in noncompliance with Technical Specifications or adversely impacted the attainment of a safety function, found during the 1998 maintenance outage were satisfactorily tested prior to returning the unit to service in September 1998. The applicable surveillance test procedures have been revised where appropriate to include provisions for testing all portions of safety-related logic circuits consistent with GL 96-01. The procedure that governs responses to NRC correspondence was revised to assure that, prior to submittal, responses fully address actions requested by the NRC.								
<ul> <li>Further corrective action will:</li> <li>Review and enhance the Engineering implem Engineering contractors to assure that perso given proper guidance, and by September 30 personnel responsible for contractor oversight</li> </ul>	nenting proce nnel responsi ), 1999 reinfo nt.	dures th ble for c rce this	nat provide contractor guidance	e for cont oversigh with Eng	rol of t are ineering			
<ul> <li>Assure, prior to the start of the 2000 refueling surveillance tests that address compliance w</li> </ul>	g outage, that ith GL 96-01	those s are ider	safety-relat htified.	ted logic	circuit			