IC Form 83)	366					••	LIC	ENSE	E EVE	NT RE	PORT (	LER)	• •	U.S. NU	PPRO XPIRE	R REGULAT	O. 318	COMMIS 0-0104	SION
	-						-						DOCK	ET NUMBER	(2)		F	PAGE	(3)
Cata	wha l	Nucle	ar S	tat	ion. Un:	ít.	2						0 1	5 1 0 1 0	0	411	4 1	OF	01
TLE (4)	incu i												5 T						
Feed	lwater	r Iso	lati	ons	Due, To	Ma	lfund	ction	of F	eedwat	er Con	ntrol Va	lves	5		(4)			
EVE	INT DATE	(5)		L	ER NUMBER (	6)		RE	PORT DAT	TE (7)		OTHE	R FACIL	LITIES INVO	TDOC	KET NUMBE	ER(S)		
ONTH	DAY	YEAR ,	YEAR		NUMBER		NUMBER	MONTH	DAY	YEAR	N	/A	AMES		0	15101	0 1 0	f1 1	1
					1.1.1			1.1			14	/ A							
015	218	8 16	816	-	01210	-	010	016	2 17	816					0	151010	0 1 0	1 1	1
1	-	-	THE	FPORT	IS SUBMITTE	D PUI	REUANT	TO THE	REQUIREN	ENTS OF 1	CFR &: /C	heck one or mor	e of the	following) (	11)				
OPE	RATING	3		20.402(8	)		1.	20.405	5(c) .>	s, *	X	50.73(a)(2)(iv)				73.71(b)			
POWE	8			20.405(a	)(1)(i)			50.38	g(1)	25		50.73(a)(2)(v)				73.71(c)			
LEVE	0	1010	-	20.405(a	a)(1)(#)			50.38	c)(2)			50.73(a)(2)(vii	)	т. 197	XX	OTHER 75	Specify I in Te	tin Abit	Form
		<del>LX x</del>		20.406(	a)(1)(iii)			50.73	a)(2)(i)			50.73(s)(2)(vii	I)(A)		1	366A)	1	a	
				20.40	)(1)(lv)		L	50.73	e)(2)(ii)			50.73(a)(2)(vii	(8)		-	0 70/1	1/0	100	
				20.406	a)(1)(v)	-		50.73	e)(2)(#5)			50.73(a)(2)(x)	-		15	0.1240	)(2	)(11	2
								LICENSEI	E CONTAC	T FOR THIS	LER (12)				TEL	EPHONE NU	MBEP		
loge	er W.	Ouel	lett	.e, 1	Associat	ONE	Engin	REACH	- Lic	ensing	DESCRIBE	C IN THIS REP	ORT (1)	710 14	3	17   31	-1	7151	3
	1	T		*	COMPLETE	-	ORTABL	1			1	COMPONEN	.	MANUFAC-	h	EPORTABLE	e .	•	
AUSE	SYSTEM	, cowe	ONENT		TURER	TO	NPRDS			CAUSE	SYSTEM	COMPONEN	_	TURER	-+	TO NPHOS			
					*						1	and and	1.						
X	SIJ	LE	IC.N	F	111310	2/2	NO				+		+	1.1.1	-				
		1	1.1					•			1	1.1.1		1.1.1					
		11	11	1		1		TEXPEC	TED (14)		1.1		19			MON	TH	DAY	YE
		8 H			SUPPLEM	ENTA	L HEPOR	TEAPEC	TED (14)				-	SUBMIS	SION	1	1	* e. 5	
		complete	EXPECT	ED SUB	MISSION DAT	E) .			X NO					DATE	(18)				
BETRA	CT (Limit	to 1400 1	paces, /.1	e, eppro	ximately fifteer	n singi	e-spece ty	pewritten	lines) (16)			and the second se					1	yea.	
							.48		. 4	244 4				×					
	•			24	· · .*														
	On M	lay 2	8, 1	986,	, at 185	53:	33 ho	urs,	a Ma	in Fee	dwater	r (CF) I	sola	tion of	occi	urred	on		
	Stea	am Ge	nera	tor	(S/G) (	C h	igh-l	nigh	level	. The	isola	ation wa	s un	detect	ted.	. An a	att	empt	
	'to c	open	the	CF I	Bypass t	to	Auxil	iary	Feed	water	(CA) N	Nozzle v	alve	s was	mad	de but	th	e	
	valu	res w	ould	not	t open.	A	n 'inv	resti	gatio	n reve	aled t	the valv	es w	vere c.	Losi	ed due	to	the	
	CF 1	lsola	tion	si	gnal. 1	The	CF 1	sola	tion	signal	was 1	reset an	d th	ne CF 1	Зура	ass to	CA	6	
	Nozz	ele v	arve	S We	ere oper	ned	. ON	May	29,	1986,	at 000	)8:49 ho	urs,	a see	cond	d CF			
	1801	latio	n oc	curi	ced on S	5/G	C hi	gh-h	igh 1	evel.	The i	Inservic	e Co	ndensa	ate	Boost	er	Pump	£.
	was	secu	red,	the	The use	ola	tion	sign	al wa	s rese	t, and	i feedwa	ter	flow	to 1	the S/G	Gs	was	
	re-e	scab	TISU	ea.	the ur	110	was	in M	ode 3	, Hot	Standb	ov, at t	ne t	ime of	t	nis ind	cid	ent.	
	This	inc	iden	t ie	assia	hed	Caus	e Co	do'v	Other	due	to the	anud	nmont	-	Euro	1		
	The	feed	wate	TCC	ontrol T	tal	ve fo	r s/	GCd	id not	full.	tieolat	equi	ow why	ma.	dn th	ron	•	
	clos	sed n	osit	ion.	This	Te	sulte	d in	the	S/G C	high-b	toh low	ell	larm	rie	In the	e		
					11110		JULLE	a au	ene	0,00	in gu-l	ingh lev	era	.iaim,					
	This	eve	nit 1	s re	portabl	le	pursu	ant	to 10	CFR 5	0.73.	Section	(a)	(2) (1)	i :	and 10	CF	R	1
					in Star 1.								100)	1-1 ( 1 )			22		

B607090027 B60627 PDR ADOCK 05000414 S

NRC Form 366 (9-83) W. W. - W.

14

.

20

IE22 1/1

4

# LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

A	P	P	RC	VE	D	OM	8	NO.	31	50-010	)4
ε	×	P	R	ES	8	31/	85				

FACILITY NAME (1)		DOCKET NUMBER (2)		LE	PAGE (3)				
	*		YEAR		NUMBER	REVISION			
Cátawba Nuclear Station, Unit	t 2	0 5 0 0 4 1 4	486	-	0 2 0	-010	0 2	OF	04

# BACKGROUND

Form 366

The Main Feedwater (CF) System (EIIS:SJ) provides normal flow to the steam Generators (S/Gs). After passing through two stages of high pressure heaters, CF divides into four lines, each feeding one of the four S/Gs. Each of the four lines contains a CF control valve and a CF control bypass valve. The CF control valve and the CF control bypass valve are normally modulated by the CF Control System to maintain proper S/G<sup>®</sup> water level. The CF control bypass valve controls flow up to approximately 15% power, and the CF control valve controls flow above 15% power. The valves will fail closed on a CF Isolation signal.

The S/G CF bypass to Auxiliary Feedwater (CA) (EIIS:BA) Nozzle value's are provided to allow CF flow to the S/Gs through the CA nozzles. Introduction of water to the S/Gs through the CA nozzles minimizes the potential for S/G water hammer transients during low power operation. There are three solenoid values (Train A, Train B, and Non-Safety) in series located in the air supply line of each value. During normal plant operation, the two train related solenoid values will be energized and the non-safety solenoid value will perform the function of opening and closing the value. The train related solenoid value will de-energize and close the value only upon receipt of a CF Isolation signal.

# DESCRIPTION OF INCLDENT

On May 28, 1986, the Unit was in Mode 3, Hot Standby. The S/Gs were being fed through the CA nozzles, but the CF control valves and CF control bypass valves were closed due to a lack of demand.

Personnel observed increasing levels in S/Gs A and C. Leakby of the CF control valves was suspected. At 1851:47 hours, the closure of valve 2CA-149, S/G A CF Bypass to CA Nozzle was initiated, and at 1852:54 hours, the valve indicated closed. At 1852:59 hours the closure of valve 2CA-151, S/G C CF Bypass to CA Nozzle was initiated. As S/G C level approached the high-high level setpoint, CF Pump A was manually tripped at 1853:04 hours. At 1853:21:999 hours, S/G C High-High Level alarm was received. CF Isolation occurred at 1853:22 hours, but the CF Isolation Annunciator in the Control Room did not alarm. At 1853:23 hours, valve 2CA-151 indicated closed. S/G C High-High Level alarm cleared at 1854:18:217 hours. Personnel were not aware that a CF Isolation had occurred because the CF Isolation Annunciator did not alarm and the S/G High-High Level alarm returned quickly to normal. Most valves associated with a CF Isolation were already closed or being closed at the time of the isolation.

At 1907:39 hours, Motor Driven CA Pumps A and B were started in order to re-establish feed to the S/Gs. The unit entered Mode 4, Hot Shutdown, at 2232 hours. \*Personnel attempted to open the CF Bypass to CA Nozzle valves, with no success. Work requests were initiated to investigate and repair the reason for each of the CF Bypass to CA Nozzle valves not opening. The investigation revealed that the safety solenoids on the valves were de-energized, preventing them from opening. This indicated that a CF Isolation had occurred.

# LICENSEE EVEN'. REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

÷.

APPROVED OMB NO. 3150-0104 EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)		LER NUMBER	PAGE (3)			
		YEAR	SEQUENT	AL REVISION NUMBER		Π	
Catawba Nuclear Station, Unit 2	0  5  0  0  0  4   1   4	4 8 6	- 0 2	0-010	0 3	OF	0 4

On May 29, 1986, at 0002:17 hours, CF Pump A was reset. At 0003:23 hours, the CF Isolation signal was reset. The CF Bypass to CA Nozzle valves were opened at 0004 hours. S/Gs A and C levels immediately started increasing. At 0008:17 hours, closure of valve 2CA-151 was initiated. At 0008:48:905 hours, S/G C High-High Level alarm was received. CF Isolation occurred at 0008:49 hours. Valve 2CA-151 also indicated closed at that time. S/G C High-High Level alarm was returned to normal. The inservice Condensate Booster Pump was secured. At approximately 0020 hours, the CF Isolation signal was reset. The CF Bypass to CA Nozzle valves were opened and feedwater flow to the S/Gs established. At approximately 0045 hours, Motor Driven CA Pumps A and B were secured.

### CONCLUSIONS

NRC FORM 366A

Form 366A

This incident is assigned Cause Code X, Other, due to equipment malfunction. Valve 2CF-28, S/G A Feedwater Control, and valve 2CF-46, S/G C Feedwater Control, did not fully isolate flow while in the closed position. The leakage resulted in a level increase in S/G A and a high-high level alarm on two occasions in S/G C. The high-high level alarms caused two CF Isolations. Work Requests have been issued to investigate and repair valves 2CF-28 and 2CF-46.

The CF\*Isolation Annunciator in the Control Room failed to alarm during each of the CF Isolations. A Work Request was issued to investigate and repair the reason for the failure. On May 30, 1986, an investigation revealed that relay contacts in 2EATC8 and 2EATC5A had status opposite of that shown on the Electrical Elementary drawings. Open links were also found in 2EATC8 and 2EATC58. The relay contacts were corrected and the links closed. The work request was completed on May 30, 1986, at 1608 hours.

The Event Recorder times were noted to be 15 hours behind the actual time on the Alarm Typer Summary. A Work Request was issued to investigate the problem and was completed on June 12, 1986.

Valves 2CF-28 and 2CF-46 are 18 inch Fisher valves, model number SS-137-ENA and the valve positioners are supplied by Moore Products, model number 721P315. A review of NPRDS indicated a low failure rate (4.0%) for Fisher valves resulting in contained leakage and a low failure rate (less than 2%) for Moore Positioners showing abnormal characteristics or needing recalibration. These malfunctions are not reportable to NPRDS due to the unit not being in commercial operation.

A review of the Work Request Data Base revealed one work request, on valve 1CF-37, S/G 1B Feedwater Control valve, where the valve position indicator show 10% open with the valve 100% closed. The electric to pneumatic signal converter was recalibrated and the valve reset to zero and stroke checked satisfactorily.

CF Isolations have been a recurring problem on Unit 2. Based on the review of the previous CF Isolations, this incident seems to be an isolated Unit 2 event. There has been one previous Unit 1 incident concerning a CF Isolation due to leakby of a S/G feedwater control valve (see LER 413/86-08).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

#### APPROVED OM8 NO. 3150-0104 EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)	
		YEAR SEQUENTIAL REVISION NUMBER NUMBER		
Catawba Nuclear Station, Unit 2	0 5 0 0 0 4 1 4	8 16 - 0 2 0 - 0 0 0	14 OF 04	

# CORRECTIVE ACTION

- (1) CA Pumps A and B were started.
- (2) The inservice Condensate Booster Pump was secured.
- (3) The Feedwater Isolation signal was reset and feedwater flow to the S/Gs was re-established.
- (4) CA Pumps A and B were then secured.
- (5) The identified Work Requests are to be completed by the end of the first available outage.

# SAFETY ANALYSIS

At the start of this incident, the unit was in Mode 3, Hot Standby, and proceeded into Mode 4, Hot Shutdown, during the incident. One CF Pump and one Condensate Booster Pump were in service. S/Gs A and C levels increased to 74% narrow range and 78% narrow range, respectively, prior to the first CF Isolation, and 66% narrow range and 84% narrow range, respectively, prior to the second. The other S/Gs levels remained normal at approximately 50% narrow range. S/Gs A and C level stabilized at 50% narrow range after 30 minutes. Adequate core heat removal was available throughout this incident. The CA Pumps did not start during the first CF Isolation due to the start signal being blocked, per procedure, after the Reactor Coolant System (EIIS:AB) pressure decreased below 1900 psi. The CA Pumps had been manually started prior to the second CF Isolation, but would have started automatically on loss of both CF Pumps.

The health and safety of the public were not affected by this incident.

NRC FORM 366A

DUKE POWER COMPANY P.O. BOX 33189 CHARLOTTE, N.C. 28242

HAL B. TUCKER VICE PRESIDENT NUCLEAR PRODUCTION

June 27, 1986

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

Subject: Catawba Nuclear Station, Unit 2 Docket No. 50-414

Gentlemen:

Pursuant to 10 CFR 50.73 Section (a) (1) and (d), attached is Licensee Event Report 414/86-20 concerning two Feedwater isolations due to the malfunction of Feedwater Control Valves. This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

Turper

Hal B. Tucker

RWO:slb

Attachment

xc: Dr. J. Nelson Grace, Regional Administrator U. S. Nuclear Regulatory Commission Region II 101 Marietta Street, NW, Suite 2900 Atlanta, Georgia 30323

> American Nuclear Insurers c/o Dottie Sherman, ANI Library The Exchange, Suite 245 270 Farmington Avenue Farmington, CT 06032

M&M Nuclear Consultants 1221 Avenue of the Americas New York, New York 10020

INPO Records Center Suite 1500 1100 Circle 75 Parkway Atlanta, Georgia 30339

NRC Resident Inspector Catawba Nuclear Station

TELEPHONE

(704) 373-4531