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DUKE POWER

June 20, 1991

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

Subject: Catawba Nuclear Station
Docket No. 50-413
LER 413/91-10

Gentlemen:

Attached is Licensee Event Report 413/91-10, concerning FEEDWATER ISOLATION DUE TO UNKNOWN CAUSE.

This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

J. W. Hampton
Station Manager

ken:LER-NRC.JWH

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IE22

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

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TITLE (4)

FEEDWATER ISOLATION DUE TO UNKNOWN CAUSE

EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR		SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 5	2 6	9 1	9 1	—	0 1 1	— 0 0	0 6	2 0	9 1	N/A	0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
5	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0 0	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
C. L. Hartzell, Compliance Manager	8 0 3 8 3 1 - 3 6 6 5

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On May 26, 1991, at 2101 hours, with Unit 1 in Mode 5, Cold Shutdown, a Feedwater (CF) System isolation occurred during racking out activities of the "A" Reactor Trip Bypass Breaker. Operations personnel had previously started the Manual Reactor Trip Functional Test, PT/1/A/4600/15, but stopped to pursue higher priority work. Later, after shift change, Operations personnel resumed the procedure to align the breakers for Engineered Safety Features (ESF) "A" Train testing. During this alignment, the Reactor Trip Bypass Breaker "A" was racked from the connect to the disconnect position. During breaker transit, the Operator heard relays activating and apparent closure of CF valves within the Doghouse. CF isolation was immediately reset and valves realigned for ESF testing. All proper personnel, including the NRC, were notified and a work request was initiated to investigate and repair the breaker. The cause for this event is unknown. During the time of the event, the Events Recorder, which could have provided more information as to the cause of this event, was out of service. No problems were found with the breaker upon completion of the work request. Operator error was not evident. Catawba will evaluate the need to replace the Westinghouse W-2 cell switch which has had sensitivity problems in the past. A Design Study is now in progress to find an acceptable substitute.

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TEXT *(If more space is required, use additional NRC Form 366A's)* (17)

BACKGROUND

The Feedwater [EIIS:SJ] (CF) System's purpose is to supply feedwater to the four steam generators [EIIS:HX] at the temperature, pressure, and flow required to maintain proper steam generator water levels commensurate with reactor power output and turbine [EIIS:TRB] steam requirements.

The Feedwater isolation signal is provided to initiate isolation of each steam generator and rapidly terminate feedwater flow and steam blowdown inside the containment following a main steam or feedwater line break in containment [EIIS:NH], to prevent loss of steam generator water inventory due to a pipe [EIIS:PSP] rupture outside containment, and to prevent overfilling the steam generators if for some reason the normal means of controlling steam generator level malfunctions. Feedwater isolation is activated by any one of the following signals: safety injection, reactor trip plus low average reactor coolant temperature (Tave), or Hi-Hi Steam Generator level. A Feedwater isolation signal closes the Feedwater Isolation Valves (1CF33, 42, 51, 60), Feedwater Purge Valves (1CF87, 88, 89, 90), Feedwater Control Valves (1CF28, 37, 46, 55), Feedwater Control Bypass Valves (1CF30, 39, 48, 57), Feedwater Preheater Bypass Valves (1CA149, 150, 151, 152), Feedwater Bypass Tempering Flow Valves (1CA185, 186, 187, 188), and Feedwater Pump Discharge Isolation Valves (1CF10, 17).

Although the CF system was not required for the existing plant Mode, actuations of Engineered Safety Features (ESF) and Reactor Protection System (RPS) are reportable even if they are spurious or unnecessary. This information is documented in NUREG-1022, Licensee Event Report System.

There are four identical Reactor Trip Breakers [EIIS:72] for each units Rod Control System [EIIS:JD]. The four breakers are arranged in a series-parallel network, which allows one main breaker and the opposite train bypass breaker to be deactivated and isolated for periodic testing or preventive maintenance.

The Reactor Trip Breakers connect the power from the Motor Generator Sets [EIIS:MG] to the Reactor Control Rod Drive Mechanisms (CRDM) [EIIS:DRIV]. When either of the two operable breakers, which are aligned in series, opens, the power is interrupted to the CRDMs. At this point power is lost to the gripper coils, the Control Rods fall by gravity into the core, and the Reactor is tripped. The Reactor Trip Breakers may either be tripped automatically, manually from the Control Room [EIIS:NA], or manually at the breaker.

The Manual Reactor Trip Functional Test, PT/1/A/4600/15, is performed each refueling outage (at least once per 18 months) to demonstrate the operability of both channels of the Manual Reactor Trip System.

EVENT DESCRIPTION

On May 26, 1991, at 1444 hours, the Manual Reactor Trip Functional Test procedure, PT/1/A/4600/15, began during Operations day shift. At 1601 hours,

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Step 12.4 was reached in the procedure. At that time, work stopped at the direction of the Shift Supervisor due to other priority work. It was determined that the procedure was not required to be completed prior to beginning the ESF testing and would be continued at a more convienient time.

At 2042 hours, Operations night shift, in preparation for alignment of "A" Train ESF testing, began realigning the Reactor Trip Breakers and Reactor Trip Bypass Breakers per Steps 12.27 and 12.28 of PT/1/A/4600/15.

At 2101 hours, while the operator was racking out Reactor Trip Bypass Breaker "A" from the connect to the disconnect position, a Feedwater isolation occurred.

The Feedwater isolation was immediately reset and the CF valves [EIIS:V] realigned in preparation for the ESF test. Operations then notified the Nuclear Regulatory Commission (NRC) and initiated Work Request (W/R) 556750PS.

The Shift Supervisor and the Operator reviewed the procedure together at the breaker location with the Operator demonstrating proper knowledge and utilization of the procedure.

On May 27, 1991, at 0849 hours, Planning received W/R 556750PS to investigate and repair the reason the Feedwater isolation signal was received while racking out Reactor Trip Bypass Breaker "A". Work could not begin on the breaker until ESF Testing was completed.

On June 2, 1991, the work request was completed with no problems being found with either the breaker or the W-2 cell switch.

CONCLUSION

The reason for the occurrence of this event is unknown. At the time of the incident, the events recorder was out of service. Had this equipment been available, it could have supplied more definitive information as to the cause of the CF isolation.

Prior to W/R investigation, it was felt that the Westinghouse W-2 cell switch was at fault. Several problems in the past had been encountered with this switch. Upon completion of maintenance activities, no problems with the breaker [EIIS:BRK] or cell switch were detected.

Operation of Station Breakers and Disconnects, procedure OP/0/A/6350/10, was reviewed between the Operator and the Shift Supervisor at the site of the breaker for possible operational problems which may have arisen. The Operator demonstrated correct usage of the procedure to the Shift Supervisor.

Maintenance Engineering Services (MES) Instrument and Electrical (IAE) System Engineers aided in the investigation of the isolation during the work request activity but could not explain the cause for the CF isolation. During the W/R

investigation, several attempts by IAE were made to duplicate the event, but with no success. Other potential abnormal conditions were evaluated, such as contact bounce and insufficient contact overlap, but everything checked out normally.

McGuire Licensee Event Report (LER) 369/90-027 documented problems found with the Westinghouse W-2 cell switch and aided in initiating Design Study MGDS-0239 to replace these switches with a more reliable type. Several problems in the past have been attributed to excessive sensivity in W-2 cell switches. MES will evaluate the need to initiate a Station Problem Report (SPR) to change out the cell switches, based on the findings from the Design Study.

A review of the Operating Experience Program data base for the past 24 months prior to this event revealed one Station Report issued from PIR 2-C90-0192. This was a spurious signal caused by contacts "bouncing" when the breaker was closed. Although the root cause of this event is unknown, the possibility of contact bouncing and/or defective W-2 cell switches was evaluated.

CORRECTIVE ACTIONS

SUBSEQUENT

1) Control Room personnel reset the CF isolation and realigned the CF valves for ESF testing.

2) Operations initiated 556750PS work request.

3) Shift Supervisor and Operator reviewed proper use of the Operation of Station Breakers and Disconnects procedure, OP/0/A/6350/10.

4) IAE performed troubleshooting per 556750PS work request to determine the cause of the CF isolation.

PLANNED

1) A Design Study has been initiated to replace the Westinghouse W-2 cell switch with a more reliable type. Design Study MGDS-239 was originated at McGuire's request; however, all information will be relevent to Catawba. MES will evaluate the need to initiate an SPR to change out the Westinghouse W-2 cell switches based on the Design Study findings.

SAFETY ANALYSIS

At the time CF isolation occurred, Unit 1 was in Mode 5, Cold Shutdown. During this Mode of operation, CF is not required; therefore, the isolation of the CF System did not affect the safety of the plant in any manner. If this event had occurred during a Mode in which the CF System was required, the system responded

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properly to a Feedwater isolation signal initiated on Reactor Trip with coincident low TAVE. The event presented no hazard to the integrity of the plant.

There were no radiological consequences as a result of this event. The health and safety of the public were not affected in any manner.