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SUBJECT: LER 90-021-00:on 901018,component cooling water sys split header configuration existed longer than permitted by TS.

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L-90-389
10 CFR 50.73

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

Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Reportable Event: 90-021
Date of Event: October 18, 1990
Component Cooling Water System Split Header Configuration Existed Longer Than Allowed By Technical Specifications

The attached Licensee Event Report is being provided pursuant to the requirements of 10CFR50.73 to provide information on the subject event.

Very truly yours,

T. F. Plunkett
Vice President
Turkey Point Nuclear Plant

TFP/DRP/dwh

Attachment

cc: Stewart D. Ebneter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

IE22
1/1

NRC Form 366
(9-83)

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

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Turkey Point Unit 3	0 5 0 0 0 2 5 0	1 OF 0 7

TITLE (4) COMPONENT COOLING WATER SYSTEM SPLIT HEADER CONFIGURATION EXISTED LONGER THAN ALLOWED BY TECHNICAL SPECIFICATIONS

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)
1 0	1 8	9 0	9 0	0 2 1	0 0	1 1	1 3	9 0	TURKEY POINT UNIT 4	0 5 0 0 0 2 5 1
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		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)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	X 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
DAVID R. POWELL, LICENSING SUPERINTENDENT	AREA CODE 3 0 5 2 4 6 - 6 5 5 9

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 October 11, 1990, Turkey Point management raised a question to FPL Engineering as to whether a Technical Specification (TS) Limiting Condition for Operation (LCO) action statement should be entered prior to splitting the Component Cooling Water (CCW) headers in Modes 1-4. At 1610, on October 18, 1990, with Units 3 and 4 in Mode 1 at 100 percent power, the preliminary FPL Engineering evaluation was reviewed by plant personnel. The evaluation showed that the normal CCW split header configuration could result in the loss of all three Emergency Containment Coolers (ECCs) during a design basis accident, assuming a single failure. At 1701, on October 18, 1990, FPL notified the NRC Operations Center of a significant event in accordance with 10CFR50.72(b)(2)(iii)(D). Although TS do not address an inoperable CCW header, an appropriate LCO action statement should have been entered prior to splitting the CCW headers. Subsequently, FPL determined that the length of time the CCW headers were split for the movement of heavy loads exceeded the appropriate action statement time limit that should have been imposed. This condition is prohibited by TS and outside the plant's design basis. FPL personnel failed to recognize that splitting the CCW headers in Modes 1-4 would result in the plant being outside its design basis. On-The-Spot-Changes have been issued against appropriate CCW System operating and inservice test procedures.

DESCRIPTION OF THE EVENT

On October 11, 1990, a proposed On-The-Spot-Change (OTSC) to Operations Surveillance Procedure 3-OSP-030.1, "Component Cooling Water Pump Inservice Test," was under review. The OTSC required that the 3B Emergency Containment Cooler (ECC) (EIIS:BK, Component:CLR) be taken out of service in accordance with Technical Specification (TS) Limiting Condition for Operation (LCO) Action Statement 3.4.2.b.1. A question was raised as to whether a TS LCO action statement should be entered each time the Component Cooling Water (CCW) System headers (EIIS:CC) were split for CCW pump inservice testing in Modes 1-4. If no LCO action statement is entered, then the single failure of an active component must be assumed as part of the accident scenario for meeting the plant design basis. If an LCO action statement is entered, then the system is required to meet design basis requirements, but the system is acknowledged to be (in most cases) incapable of accommodating single active failures. FPL Engineering was asked to evaluate splitting the CCW headers in Modes 1-4 without entering an LCO action statement during inservice testing.

Subsequently, management personnel were notified that the Unit 3 CCW System headers were split between the 3A and 3B CCW pumps in accordance with Section 7.1 of Operating Procedure 3-OP-030, "Component Cooling Water System." The CCW headers had been split since 0200, on October 9, 1990, for a Spent Fuel Pool bridge crane lift. No LCO action statement for the CCW System had been entered. The heavy load lift operation was suspended. Control Room personnel were instructed to cross-tie the CCW System headers and not to split the CCW headers for Unit 3 or Unit 4 until further notice. At 2130, on October 11, 1990, the normal CCW System configuration for plant operations (i.e., cross-tied) was re-established.

At 1610, on October 18, 1990, a preliminary FPL Engineering operability assessment was reviewed by management personnel. The operability assessment included a Failure Modes and Effects Analysis (FMEA) for the normal CCW split header configuration allowed by procedures 3/4-OP-030 and 3/4-OSP-030.1. The configuration was evaluated for a Large Break Loss of Coolant Accident (LBLOCA) concurrent with a loss of offsite power and the single failure of either Emergency Diesel Generator (EDG). In the current emergency power system design, the A and C CCW pumps are powered from the same 4160 Volt AC bus. The C CCW pump is prevented from starting during EDG sequencing on a loss

of offsite power unless the A CCW pump breaker is open and racked out. No credit was taken for the C CCW pump in the FMEA.

For the worst case single failure (i.e., loss of the B EDG) power is lost to one ECC fan, the B CCW pump, one Containment Spray (CS) pump and one train of Emergency Core Cooling Systems (ECCS). Loss of power to the CCW pump results in a loss of flow to the two remaining ECCs. Because of a loss of all three ECCs, this scenario would place the plant outside of its design basis during such a postulated design basis event, if the appropriate TS LCO action statement was not entered.

At 1701, on October 18, 1990, FPL notified the NRC Operations Center of a significant event in accordance with 10CFR50.72(b)(2)(iii)(D) as any event or condition that alone could have prevented fulfillment of the safety function of a system that is needed to mitigate the consequences of an accident. Upon further review, FPL determined that the NRC notification should have been made in accordance with 10CFR50.72(b)(1)(ii)(B) as a condition that was outside the design basis of the plant. The NRC notification occurred within one hour, as required by 10CFR50.72(b)(1)(ii)(B).

FPL conducted a further review of the CCW split header configurations which included a review of the Intake Cooling Water (ICW) split header configurations allowed by Operating Surveillance procedures 3/4-OSP-019.1, "Intake Cooling Water Pump Inservice Test." The ICW and CCW inservice tests, performed in accordance with procedures 3/4-OSP-019.1 and 3/4-OSP-030.1, were conducted without entering an LCO action statement. The length of time the ICW and CCW split header configurations existed for pump inservice testing was less than the appropriate LCO action statement time limits that should have been imposed. Additionally, procedures 3/4-OSP-019.1 and 3/4-OSP-030.1 require that the split header configurations be maintained under operator control in order to restore the system configuration to its normal alignment in the case of an emergency. FPL considers this condition to be a failure to administratively enter TS LCO action statements. Splitting the ICW and CCW headers is allowed by TS and is in accordance with the FPL License, when performed within applicable LCO action statement time limits.

During the above review, some split header configurations not normally used for inservice testing, but allowed by procedures 3/4-OSP-019.1 and 3/4-OSP-030.1, would have required entry into

TS 3.0.1. These split header configurations did not exist at the time of this event, but the potential for entering one of these abnormal system configurations did exist.

The CCW System split header configuration for fuel cask handling allowed by procedures 3/4-OP-030 was conducted without entering an LCO action statement. Procedures 3/4-OP-030 do not require this CCW split header configuration to be maintained under operator control. The CCW split header configurations lasted for relatively long periods of time (e.g., days or weeks). Since the CCW System TS do not address inoperable headers, an appropriate TS LCO action statement should have been entered for the CCW header split. Because the CCW headers were split for movement of heavy loads much longer than that allowed by the appropriate TS LCO action statement time limit, this condition is considered to be outside the plant's design basis.

CAUSE OF THE EVENT

Failure to enter an LCO action statement prior to splitting the ICW and CCW headers in accordance with procedures 3/4-OSP-019.1 and 3/4-OSP-030.1 was caused by inadequate administrative controls. No policy had been established to provide guidance for entering TS LCO action statements during inservice testing at the Turkey Point Nuclear Plants.

Failure to enter an LCO action statement prior to splitting the CCW headers in accordance with procedures 3/4-OP-030 was caused by non-cognitive errors by licensed and non-licensed utility personnel. TS for the CCW System do not address an inoperable header. Splitting the CCW headers was not recognized as a condition that would place the plant in a condition outside its design basis.

Operating Procedure OP 3100.1, "Component Cooling System-Normal Operation," was revised on June 23, 1976 to allow splitting the CCW headers during movement of heavy loads over the cask wash area. This administrative control was implemented in response to an NRC concern that was raised during a license amendment review allowing transfer of spent fuel casks between units. When procedure OP 3100.1 was superceded by procedures 3/4-OP-030 in 1988, the practice of splitting the CCW headers was retained. Furthermore, the CCW split header configuration, as defined within procedures 3/4-OP-030, has been used for other heavy load lifts in the cask wash area (e.g., Spent Fuel Bridge

Crane) as a means of satisfying FPL commitments relative to NUREG 0612, "Control of Heavy Loads at Nuclear Power Plants."

ANALYSIS OF THE EVENT

Following a Large Break LOCA, the resulting containment temperature/pressure peaks are initially mitigated by the passive structural heat sinks. The subsequent cooling provided by Containment Spray System flows and the heat removal of the ECCs ensure that the containment temperatures/pressures are steadily reduced, thereby ensuring that sufficient margin exists to protect electrical equipment from the effects of continuously elevated containment temperatures. Based on previous sensitivity studies performed to quantify the containment pressure/temperature response, the maximum containment design pressure is not predicted to be exceeded, even with no ECCs operating. Long term exposure of equipment inside containment to temperatures and pressures in excess of those for which they were qualified would be expected to shorten the service life of equipment.

In order to assist in evaluating the safety significance of losing all ECCs, a risk based methodology developed during the design basis reconstitution program was applied. A review of required safety functions was conducted for the long term post-LOCA period. The most dominant scenarios were established and quantified. The quantified scenarios lead to a core melt based on the ultimate failure of the emergency core cooling systems (ECCS) postulated as the result of exceeding the environmental qualification of components required for extended ECCS operation. The evaluation demonstrates that the probability of a core melt (5.0×10^{-16} per year) is very low. The core melt probability is low enough to demonstrate that the failure scenario is insensitive to the amount of time in which the system was in a split header configuration. Therefore, FPL concludes that the probability of such an event is extremely low and not a significant contributor to the overall risk of core melt.

The loss of all ECCs is dependent on a loss of offsite power, the failure of a specific EDG (i.e., the B EDG), and the CCW System being in a split header configuration. Recovery of a source of power for the de-energized bus(es) would allow full containment cooling capacity to be regained by operators. An examination was performed of the availability of AC power sources as a function of time after design basis events,

subsequent to a loss of offsite power. Following a loss of offsite power coincident with a loss of an EDG, three power sources to re-energize buses are available to plant operators: (1) repair or restore the faulted EDG; (2) restore or regain offsite power; and (3) power de-energized buses using at least two of five blackstart diesel generators. The restoration of power using any or all of the above sources is specifically addressed by plant Emergency Operating Procedures and/or Off-Normal Operating Procedures.

CORRECTIVE ACTIONS

1. On-The-Spot-Changes have been issued against procedures 3/4-OP-030. These changes add a caution statement that the applicable LCO action statement for an ECC is required to be entered prior to splitting the CCW headers.

2. On-The-Spot-Changes have been issued against procedures 3/4-OSP-030.1. These changes added notes requiring the Plant Supervisor-Nuclear to be notified that the applicable LCO action statement for an ECC is required to be entered prior to splitting the CCW headers. Additionally, splitting the CCW headers between the B and C CCW pumps, where the C CCW pump is alone aligned to two ECCs, is no longer permitted.

3. On-The-Spot-Changes have been issued against procedures 3/4-OSP-019.1. These changes added notes requiring the Plant Supervisor-Nuclear to be notified that the appropriate LCO action statement for an ICW header is required to be entered prior to splitting the ICW headers. Additionally, splitting the ICW headers between the B and C ICW pumps, where the C ICW pump is alone aligned to two CCW heat exchangers, is no longer permitted.

4. A Final Safety Analysis Report (FSAR) change package has been initiated. The change package includes clarifications to those FSAR sections addressing ICW and CCW, based on this event. Appropriate clarification statements will be included in the next 10CFR50.71(e) annual FSAR update.

5. Changes have been initiated to the CCW Design Basis Document (DBD) and the ICW DBD. These changes provide clarification that the ICW System and CCW System must be maintained as open systems during unit operation to accommodate single failure criterion.

6. Training Brief No. 276, "CCW and ICW Split Header Operations," has been issued. The training brief includes a copy of the final FPL Engineering operability assessment performed for the ICW and CCW split header configuration event.

7. A policy statement is being developed to address LCO action statement entries for surveillance testing, equipment maintenance, or other activities resulting in abnormal system configurations. This policy statement will be approved by November 30, 1990.

ADDITIONAL INFORMATION

No similar events have been identified.