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 FACIL: 50-250 Turkey Point Plant, Unit 3, Florida Power and Light C      05000250  
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 MOWREY, C.L.      Florida Power & Light Co.  
 PLUNKETT, T.F.      Florida Power & Light Co.  
 RECIP. NAME      RECIPIENT AFFILIATION

SUBJECT: LER 93-002-00: on 930115, small steam leak discovered on abandoned pressurizer spray valve bypass line. Caused by welders failing to ensure adequate pullback of pipe cap. New pipe cap welded on & faulted line removed. W/930205 ltr.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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FEB 05 1993

L-93-027  
10 CFR 50.73

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

Gentlemen:

Re: Turkey Point Unit 3  
Docket No. 50-250  
Reportable Event: 93-002-00  
Reactor Coolant System Pressure Boundary Leakage;  
Technical Specification Required Shutdown

The attached Licensee Event Report 250/93-002-00 is being provided in accordance with 10 CFR 50.73 (a) (2) (i) (A).

If there are any questions, please contact us.

Very truly yours,

T. F. Plunkett  
Vice President  
Turkey Point Nuclear

TFP/CLM/cm

enclosure

cc: Stewart D. Ebnetter, Regional Administrator, Region II,  
USNRC  
Ross C. Butcher, Senior Resident Inspector, USNRC, Turkey  
Point Plant

100060

9302110423 930205  
PDR ADDCK 05000250  
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# LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>TURKEY POINT UNIT 3</b>										DOCKET NUMBER (2) <b>05000250</b>		PAGE (3) <b>1</b> OF <b>4</b>	
TITLE (4) <b>REACTOR COOLANT SYSTEM PRESSURE BOUNDARY LEAKAGE; TECHNICAL SPECIFICATION REQUIRED SHUTDOWN</b>													
EVENT DATE (5)			LER NUMBER(6)			RPT DATE (7)			OTHER FACILITIES INVOLVED (8)				
MON	DAY	YR	YR	SEQ #	R#	MON	DAY	YR	FACILITY NAMES			DOCKET # (S)	
01	15	93	93	002	00	02	05	93					
OPERATING MODE (9)		1	<u>10 CFR 50.73(a)(2)(i)(A)</u>										
POWER LEVEL (10)		100											
LICENSEE CONTACT FOR THIS LER (12)													
C. L. Mowrey, Licensing OEF Engineer/Analyst										TELEPHONE NUMBER			
										305-246-6204			
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)													
CAUSE	SYSTEM	COMPONENT	MANUFACTURER			NPRDS?	CAUSE	SYSTEM	COMPONENT	MANUFACTURER			NPRDS?
A	AB	PSF	X999			Y							
SUPPLEMENTAL REPORT EXPECTED (14) NO <input checked="" type="checkbox"/> YES <input type="checkbox"/>							EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR		
(if yes, complete EXPECTED SUBMISSION DATE)													
ABSTRACT (16)													
<p>On January 15, 1993, Turkey Point Unit 3 was in Mode 1 at 100 percent power. At about 1432, a small steam leak was discovered on an abandoned pressurizer spray valve bypass line. The leak emanated from a socket weld connecting a pipe cap to the pipe nipple. An Unusual Event was declared for pressure boundary leakage. The Unusual Event was terminated when the unit entered Mode 5.</p> <p>Increases in Containment radioactivity had been occurring since late December, 1992, but with no measurable change in leakage.</p> <p>The cause of the leak appears to be personnel error in that welders did not ensure adequate pullback of the pipe cap when it was installed in 1985. The inadequate pullback caused excessive local stress, which resulted in stress corrosion cracking of the fillet weld.</p> <p>As corrective action, the faulted line was removed and a new pipe cap welded on. The abandoned spray valve bypass line on Unit 4 will be inspected and/or replaced during the next refueling outage.</p>													

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## I. DESCRIPTION OF THE EVENT

On January 15, 1993, Turkey Point Unit 3 was in Mode 1 at 100 percent power. At about 1432, a small steam leak was discovered on an abandoned pressurizer spray valve [AB; pzz, pcv] bypass line, between the previous "A" spray valve body and the pressurizer spray nozzle [AB: pzz, nzl].

Indications of increasing activity in the containment atmosphere had been occurring since late December, 1992. Containment Particulate Monitor R-11 [IK: mon] and Containment Gas Monitor R-12 [IK: mon] had elevated readings and occasional spikes, which seemed to be related to operation of the pressurizer spray valves. RCS leakage showed no measurable increase, and containment entries made prior to January 15, 1993, for leak inspections uncovered no leakage.

On January 15, 1993, at about 1135, the leak was discovered in the vicinity of the abandoned spray valve bodies. Because of the location of the leakage (inside the pressurizer cubicle), exact determination of the leak point was very difficult. At about 1432, the leak was determined to be on the abandoned spray valve bypass line. Based on its location the leak was declared to be RCS pressure boundary leakage.

Technical Specification 3.4.6.2a requires that for any pressure boundary leakage, the plant must be in HOT STANDBY (Mode 3) within 6 hours and in COLD SHUTDOWN (Mode 5) within the following 30 hours. Since the leak could not be isolated, it was declared to be pressure boundary leakage, resulting in the Notification of an Unusual Event (NOUE). The NRCOC was notified of the NOUE at 1450. The unit entered Mode 3 at 1755, on January 15, entered Mode 5 at 1815 on January 16, 1993, and downgraded the Unusual Event to a non-emergency event.

The leak emanated from a pipe cap to nipple socket weld. There was a visually discernable 1/4" linear indication within the weld metal. Subsequent liquid penetrant examination further confirmed the magnitude of the flaw via heavy bleed-through along an approximate 1/2" circumferential area.

## II. CAUSE OF THE EVENT

### Immediate Cause

The immediate cause of the Unusual Event was a leak through the fillet weld between the pipe nipple and the pipe cap. Since the leak could not be isolated, it was considered pressure boundary leakage.

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### Intermediate Cause

The intermediate cause of the leak was stress corrosion cracking (SCC) of the fillet weld. In order for SCC to occur, the critical amount of stress, environment, and susceptible material all need to be present.

Examination showed inadequate "pullback" between the pipe and the cap. The lack of pullback can cause high localized stresses which increase the chances and effects of stress corrosion cracking. The direction and orientation of the failure, which corresponds to the shear plane through the throat of the fillet weld, supports the presence of stresses induced from inadequate pullback.

Although contaminants are controlled to low levels in the RCS, the stagnant conditions resulting from this particular piping configuration could have led to higher localized concentrations of contaminants.

The high stress and stagnant conditions, combined with the susceptible material (316 stainless steel) eventually resulted in leak path development through the throat of the fillet weld.

### Root Cause

The root cause of the leak appears to be personnel error in that non-licensed contract personnel did not ensure adequate pullback of the pipe cap when it was installed, as part of a plant modification in 1985. A review of the configuration of the capped bypass lines shows that while this cap was installed vertically (cap "hanging down"), the other caps were installed horizontally.

While welding the vertical cap, it may have been difficult to hold it in the precise vertical location to get the required pullback. It would be easier to hold the cap bottomed against the pipe. The close proximity of the integral attachment support in the field and other spatial limitations made the weld fitup and access difficult. In the other two lines, the horizontal orientation would allow for better positioning and the required pullback.

### III. ANALYSIS OF THE EVENT

The leak was discovered as a result of inspections conducted as a result of increased readings on the Containment Atmosphere Gaseous and Particulate Radioactivity Monitors. At no time did the RCS leak rate exceed the Technical Specification Limiting Condition for Operation for unidentified RCS leakage of 1 GPM. RCS leak detection is a recognized function of the containment activity monitors, required by Technical Specification 3.4.6.1. R-11 and R-12 on Unit 3 are new instruments, installed during the refueling outage completed last December. Their accuracy has been demonstrated to be nearly an order of magnitude better than the instruments they replaced. As a result, they made possible the very early detection of this leak, which was on the order of 2-3 drops per minute when found.

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This type of weld defect is not expected to result in catastrophic failure, but may gradually increase if unattended. Nevertheless, had the weld suffered catastrophic failure, the size of the break would have been limited to the three-quarter inch diameter of the abandoned bypass line. Schedule 80 piping of three-quarter inch nominal pipe size translates into a break area of 0.376 square inches. This size of break is bounded by the small break Loss Of Coolant Accident analyzed in the Updated Final Safety Analysis Report, Section 14.3.2.2, in which the limiting small break size is given as a two inch diameter cold leg break (3.142 square inch area).

## IV. CORRECTIVE ACTIONS

1. The section of pipe with the failed weld was removed, along with a tee and another pipe cap, and a new pipe cap welded in place.
2. The vertical cap on the abandoned spray valve bypass line on Unit 4 will be inspected for evidence of sufficient pullback, and/or replaced during the next refueling outage.

## V. ADDITIONAL INFORMATION

A similar leak was reported in LER 250-92-014-00. In that event, the leak was through the pipe cap itself, because the pipe cap was an inappropriate material (machined from bar stock rather than forged).

EIIS Codes are shown in the format [EIIS SYSTEM: IEEE component function identifier, second component function identifier (if appropriate)].