



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-250/91-18 and 50-251/91-18

Licensee: Florida Power and Light
9250 West Flagler Street
Miami, FL 33102

Docket Nos.: 50-250 and 50-251

License Nos.: DPR-31 and DPR-41

Facility Name: Turkey Point 3 and 4.

Inspection Conducted: May 28-31, 1991

Inspector: *[Signature]*
W. P. Kleinsorge, P.E., Reactor Inspector

7/6/91
Date Signed

Approved by: *[Signature]*
J. J. Blake, Chief
Materials and Process Section
Engineering Branch
Division of Reactor Safety

7/6/91
Date Signed

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of residual heat removal system recirculation pipe failure, reactor coolant system heatup and cooldown temperature limits, and Inservice Inspection-Eddy Current examination.

Results:

In the areas inspected, no violations or deviations were identified. Licensee management involvement with the licensee's technical staff assure that technical issues are resolved from a conservative standpoint. To date the licensee has taken an aggressive conservative approach in the root cause failure analysis and subsequent restoration of the failed Residual Heat Removal System recirculating piping. The licensee appears to have an adequate system to assure compliance with Technical Specifications for control of the Reactor Coolant System heatup and cooldown. Steam Generator tube examination and subsequent plugging has been approached from a conservative standpoint.



REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *J. Arias, Technical Assistant to Vice President
- *W. Bladow, Quality Manager
- S. Franzone, Lead Nuclear Engineer JPN
- *M. Huba, JPNS
- *J. Knorr, Regulatory Compliance Supervisor
- *V. Kaminiskas, Operations Superintendent
- *D. Powell, Licensing Superintendent
- *D. Sipos, Director of Nuclear Construction

Other licensee employees contacted during this inspection included engineers, mechanics, technicians and administrative personnel.

NRC Resident Inspectors

- *R. Butcher, Senior Resident Inspector (SRI)
- *G. Schnebli, Resident Inspector (RI)
- L. Trocine, Resident Inspector (RI)

*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Residual Heat Removal System Recirculation Pipe Failure

On February 19, 1991, leakage was detected by the licensee in a section of Residual Heat Removal (RHR) system piping in Unit 3. The leakage was detected during the second ten year Inservice Inspection (ISI) hydrostatic testing of this 10-inch, schedule 10 type 304, stainless steel line. The leakage was described as weepage from approximately nine pinhole leaks clustered on the bottom side of a horizontal pipe run and elbow in line 10" SI-151R at Node 33B depicted on isometric drawing 5613-P-601-S. The licensee removed the elbow and a section of pipe by cutting Weld 8 (see ISI isometric drawing 003-B19, Revision 3) and the pipe between Welds 9 and 10, approximately one to two feet downstream of weld 9. The American Society of Mechanical Engineers Boiler and Pressure Vessel (ASME B&PV) Code Section XI, Article 7000 requires the licensee to determine the cause of failure.

Liquid penetrant examination and metallurgical failure analysis of the leaking area indicated that failure resulted from O.D. initiated Stress Corrosion Cracking (SCC). Root cause failure analysis indicated that



past housekeeping washdowns appeared to have drained down a stairwell and adjacent walls as evidenced by stains in the area. Moisture in those areas would have wetted the pipe and could have introduced the SCC contaminants to the piping surface. Newer paint, in the area, is stain free, which suggests that moisture has not wetted the area in several years. This was confirmed by senior health physics and operations personnel, who indicated that washdowns had occurred early in the plant's life but were suspended due to ALARA and SCC concerns.

The licensee is currently in the process of replacing the elbow and pipe section with new materials. This material change out, will cause two existing welds to be replaced and one new weld to be added.

The inspector reviewed NCR No. N-91-0220 (which remains open); the metallurgical failure analysis report, ESI-MET-91-018; and "RHR Piping Failure Analysis, and Problem Report/ In-House Event Summary", for Event No. 3-91-001. In addition, the inspector interviewed licensee personnel, and conducted an inspection of the failure location.

To date the licensee has taken an aggressive conservative approach in this root cause failure analysis and subsequent restoration of the failed RHR recirculating piping.

With in the areas examined no deviations or violations were identified.

3. Reactor Coolant System Heatup and Cooldown Temperature Limits

Currently Technical Specification (TS) 3.4.9.1, Amendment Nos 137 and 132, specifies a maximum heatup and cooldown for the Reactor Coolant System (RCS), except the pressurizer, of 100 degree F in any 1-hour period. TS 3.4.9.2 specifies, for the pressurizer, a maximum heatup of 100 degrees F in any 1-hour period and a maximum cooldown of 200 degrees F in any one hour period. These requirements have remained constant since October 25, 1978 with Amendment Nos 40 and 32. The above is based on the FSAR design basis of 200 heatup/cooldown cycles for the life of the plant. The licensee tracks the heatup/cooldown cycles and controls temperature limits by procedure, a departure from which initiates a Non-Conformance Report (NCR). From the first heatup to the last cooldown Unit 3 has had 66 heatup/cooldown cycles (08/13/72-12/14/90) and Unit 4 has had 71 heatup/cooldown cycles (05/08/73-11/29/90). To date the licensee has not deviated from TS 3.4.9.1 (or its predecessor TS) but has deviated from TS 3.4.9.2 (or its predecessor TS) on two separate occasions. On both occasions NCRs were initiated: Unit 4 NCR 88-0025 "RCS Cooldown/PZR Heatup > 100 Degree/Hr." and Unit 3 NCR 89-0198 "RCS Cooldown Process".

To evaluate this area, the inspector reviewed selected procedures, NCRs, the data base for Design Thermal and Loading Cycles Station Heatup/Cooldown, TSs, JPN-PTN-SEMS-91-003, Revision 0, "Modified Pressurizer Spray Transient During Plant Cooldown" and STC-TR-85-003, "Structural Evaluation Florida Power and Light Turkey Point Units 3 and 4



Pressurizer Surge Line and Spray Line for Pressurizer/RCS Differential Temperature of 320 Degrees F". The licensee appears to have an adequate system to assure compliance with TSs 3.4.9.1 and 3.4.9.2, and all previous versions of those TSs. Deviations from those TSs have been considered in the evaluations of those TS deviations.

With in the areas examined no deviations or violations were identified.

4. Inservice Inspection

The inspector reviewed documents and records as indicated below, to determine whether ISI was being conducted in accordance with applicable procedures, regulatory requirements, and licensee commitments. The applicable code for ISI, for both Unit 3 and Unit 4 is the American Society of Mechanical Engineers Boiler and Pressure Vessel (ASME B&PV) Code, Section XI, 1980 edition with addenda through winter 1981 (80W81). Both Units are in the first Outage, of the third 40 month Period, of the second ten year ISI Interval (10,P3,I2), ending February 21, 1994 for Unit 3 and April 14, 1994, for Unit 4. Unit 4 is currently in refueling. Unit 3 received its Operating License July 19, 1972, and commenced commercial operations on December 14, 1972. Unit 4 received its Operating License on April 10, 1973, and commenced commercial operations on September 7, 1973. The licensee's nondestructive examination personnel, augmented by contract personnel from Zetec, NDE Technology and Westinghouse Electric Corporation (W), are performing Eddy Current (EC) Examination of Steam Generator (S/G) tubes under the umbrella of the FPL QA program.

Eddy Current Examination

During this outage no new tubes in the Unit 4 S/Gs have been identified in which the 40% throughwall plugging limit was exceeded. The licensee installed five plugs in three tubes this outage. Three of the five newly installed plugs replaced existing plugs.

S/G A tube R2-C5 was plugged November 22, 1988 because this tube was obstructed by a foreign object (a portion of a hose clamp) and could not be EC examined. This tube was plugged with Inconel 600 Heat No. 4523 plugs, a heat of material which subsequently was identified as suspect. The Inconel 600 Heat No 4523 plugs were removed under warranty from W.

S/G B tube R8-C81 was plugged because the tube was restricted at approximately 22-inches above the tube sheet face close to the top of the tube sheet. Review of previous examination data revealed that the restriction has increased over time. A 0.700-inch probe was passed during Preservice Inspection. A 0.680-inch probe failed to pass but a 0.650-inch probe did successfully pass during the October 1988 Inservice Inspection. During this outage a 0.580-inch probe failed to pass. Subsequent remote visual examination using a Welsh Allen Video Probe showed no evidence of foreign objects, but did identify irregularities in the tube inside dimensions at height of approximately 22 inches.



S/G B tube R31-C14 hot leg, exhibited boric acid deposits on the end of the plug and inside the bore of the plug. The plug made from Inconel 600 Heat No. NX-1989 was removed and replaced. The removed plug was visually, mechanically and metallurgically examined by W. W indicated that the examinations did not reveal any cracks and (W) therefore concluded that the suspected leakage was not due to SCC of Heat No NX-1989.

Plugged S/G Tubes

Unit 3

	S/G A	S/G B	S/G C
As Manufactured	0	0	0
S/G Replacement/ Refueling No.7	11	5	17
Refueling No.10	0	0	3
Refueling No.11	4	9	6
Unit 3 Total	15	14	26

Unit 4

As Manufactured	1	0	9
S/G Replacement/ Refueling No.8	14	7	0
Refueling No.11	1	0	0
Refueling No.12	0	1	0
Unit 4 Total	16	8	9

S/G EC tube examination and subsequent plugging has been approached from a conservative standpoint.

With in the areas examined no deviations or violations were identified.

5. Exit Interview

The inspection scope and results were summarized on May 31, 1991, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results. Although reviewed during this inspection, proprietary information is not contained in this report. No dissenting comments were received from the licensee.



6. Acronyms and Initialisms

ALARA	- As Low As Reasonably Achievable
ASME	- American Society of Mechanical Engineers
B&PV	- Boiler and Pressure Vessel
DPR	- Demonstration Power Reactor
EC	- Eddy Current
FPL	- Florida Power and Light
ISI	- Inservice Inspection
NCR	- Non-Conformance Report
NRC	- Nuclear Regulatory Commission
P.E.	- Professional Engineer
QA	- Quality Assurance
QC	- Quality Control
RCS	- Reactor Coolant System
R	- Revision
RHR	- Residual Heat Removal
RI	- Resident Inspector
SRI	- Senior Resident Inspector
S/G	- Steam Generator
SCC	- Stress Corrosion Cracking
TS	- Technical Specification
W	- Westinghouse Electric Corporation