

July 16, 1990

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July 16, 1990

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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Report Nos.: 50-250/90-24 and 50-251/90-24

Licensee: Florida Power and Light Company
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: June 25-29, 1990

Inspector: Scott E. Sparks 7/11/90
S. Sparks Date Signed

Approved by: G. A. Bellisle 7/12/90
G. A. Bellisle, Chief Date Signed
Test Programs Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of inservice testing (IST), Inspection and Enforcement (IE) Bulletin followup, and followup on previous inspection findings.

Results:

In the areas inspected, no violations or deviations were identified.

The licensee was performing IST in accordance with their current IST Program, and ASME Section XI requirements. Generic weaknesses as identified in Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs, were being addressed through the IST Program revision currently underway, paragraph 2.

The licensee's program for IE Bulletin 85-03, Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings, had improved in the area of root cause analysis for valve deficiencies, paragraph 3.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *L. Bladow, Plant Quality Assurance Superintendent
- *K. Harris, Site Vice President
- *V. Kaminskis, Operations Superintendent
- *J. Mack, IST Coordinator
- *L. Pearce, Plant Manager
- R. Redman, Auxiliary Feedwater (AFW) System Engineer
- *K. Remington, System Performance Group Coordinator
- J. Sharpe, Motor-Operated Valve (MOV) Coordinator

Other licensee employees contacted during this inspection included craftsmen, engineers, operators, technicians, and administrative personnel:

NRC Resident Inspectors

- *R. Butcher, Senior Resident Inspector
- T. McElhinney, Resident Inspector
- *G. Schnebli, Resident Inspector

*Attended exit interview

2. Inservice Testing (73756)

10 CFR 50.55a(g) and Technical Specification (TS) surveillance requirement 4.0.5 require that ASME Code Class 1, 2, and 3 pumps and valves be inservice tested in accordance with Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, which specifies testing requirements to assess operational readiness. The current Turkey Point IST Program is based on the requirements of the 1980 Edition of the Code through Summer 1980 Addenda.

The inspector reviewed the IST Program to determine if the licensee was incorporating the guidelines contained in Generic Letter (GL) 89-04, Guidance on Developing Acceptable Inservice Testing Programs, dated April 3, 1989. By letter dated October 3, 1989 (L-89-358), Florida Power and Light Company (FPL) committed to the staff that the procedures reflecting the recommendations of the positions of GL 89-04 would be implemented such that tests performed after July 1, 1990, would conform to the specified requirements. However, subsequent discussions during the inspection indicated that relief requests submitted with the IST Program revision had not been reviewed by NRR and, as such, procedure revisions would not be completed by July 1, 1990. The licensee was discussing the status of relief requests with NRR, and continuing to revise procedures to

address the GL 89-04 positions. The inspector discussed planned revisions to the IST Program for pump and valve testing of components in the AFW system. The inspector also discussed general testing methodology, and concluded the licensee had a proper understanding of the general guidance provided in GL 89-04. However, additional inspection would be required to verify that testing procedures were properly revised and implemented.

The inspector reviewed the licensee's implementation of their current IST Program through a review of procedures, plant drawings, and test results that accomplish IST for pumps and valves that are located in the AFW system. The following specific areas were reviewed by the inspector:

a. Pump Testing

The inspector reviewed IST of the AFW pumps for both units to determine if testing was performed in accordance with Section XI, Subsection IWP requirements. The licensee's AFW system consists of three turbine driven AFW pumps for both Units, any of which may be cross-connected. The current testing method aligns flow from the condensate storage tank, and flow control valves are adjusted to obtain a flow rate of 125 gpm to each of the three steam generators. The licensee performs the Section XI test using procedure 0-OSP-075.11, Auxiliary Feedwater Inservice Test, dated 3-7-90, at three month intervals. The inspector reviewed the licensee's acceptance criteria for differential pressure, vibration, and bearing temperature, and verified that they were in accordance with Section XI, Table IWV-3100-2.

The inspector noted that by procedure 0-OSP-075.11, the flow rate was adjusted and verified to be 125 gpm for each steam generator by throttling each of the three flow control valves. The position of these valves was recorded; however, the flow rate as indicated on flow indicators HIC-1401A, 1457A, and 1458A, was not recorded. Section XI of the Code requires that the test parameters in Table IWP-3100 be measured and recorded. The licensee's procedure meets the intent of this requirement, in that one parameter (pump flow rate) was verified and held constant, while the other parameter was measured and evaluated against acceptance criteria. Although the licensee verified the AFW flow rate, a possible enhancement to the procedure would be to record the flow rate. These comments were provided to the licensee.

The inspector compared recent test results with drawings 5610-M-34-9, 10, and 11, which were the vendor head curves for the AFW pumps. Although this comparison was not an ASME Section XI testing requirement, it may provide another source of information on whether the pump had experienced any significant degradation, or whether it could provide sufficient accident flow rate. The licensee stated that this comparison was usually performed after any major pump maintenance



which could affect the hydraulic characteristics. The inspector noted that the AFW pumps were operating approximately on the vendor's head curves.

The inspector also discussed possible testing enhancements for pump vibration monitoring. Section XI, Subsection IWP requires vibration monitoring in peak-to-peak displacement, which the licensee accomplished per IST. However, pump vibration velocity measurements are considered to provide a better overall indicator of pump vibration problems. This is due, in part, because the overall vibration severity of a component is a function of displacement and frequency, which can also be attained through the measurement of peak velocity. The NRC is currently considering rulemaking to reference ASME Standard OM-6, Inservice Testing of Pumps in Light-Water Reactor Power Plants. This standard would require pump vibration velocity measurements as part of IST. The licensee stated that peak vibration velocity measurements were taken as part of the predictive maintenance program, and results that indicate possible pump degradation are provided to IST personnel.

b. Power Operated Valves

As previously discussed, FPL committed to the staff that procedures reflecting the revised IST Program would be implemented by July 1, 1990. As one aspect of this inspection, the inspector reviewed IST for motor operated (MOV), air operated (AOV), and manual valves in the AFW system. The valves included in this review are as follows:

3-082A	3-082B	4-082A	4-082B
3-084A	3-084B	4-084A	4-084B
3-086A	3-086B	4-086A	4-086B
AFSS-1A	AFSS-2A	AFSS-1B	AFSS-2B
AFSS-1C	AFSS-2C	MOV-3-1403	MOV-3-1404
MOV-3-1405	MOV-4-1403	MOV-4-1404	MOV-4-1405
CV-3-2816	CV-3-2817	CV-3-2818	CV-4-2816
CV-4-2817	CV-4-2818		

The inspector reviewed the IST program document and verified that the criteria of Section XI, IWV (1980) were specified and implemented in the program, including:

- Position indication (IWV-3300).
- Valve exercising and stroke timing (IWV-3411).
- Stroke time at quarterly intervals (IWV-3412).
- Stroke time at cold shutdown or refueling outages where relief requests are established. Relief requests stating justification for alternate positions are included in the program document and are based on the positions of GL 89-04, (IWV-3412).
- Fail Safe actuation (IWV-3415).
- Valve failure criteria (IWV-3417).
- Return of components to service (IWV-3416).



The inspector reviewed testing results from 1988 through 1990 and concluded that testing was performed at the required frequency. These records also indicate that subsequent to maintenance or modification, valves were tested prior to being returned to service.

The test procedures for the revised program were not yet finalized. As stated in the licensee's letter dated October 3, 1989, the acceptance criteria for limiting values for all power operated valves was still under review. The inspector deferred a detailed review of this area pending finalization of the test procedures.

Some of the valves listed above are manual valves, which have IST exercising requirements only if they are classified as active valves. Active valves are defined as valves which would have to change position to perform a safety function in shutting down the reactor or mitigating the consequences of an accident. Although this inspection was not intended to be a detailed analysis of the scope of the IST Program, the inspector concluded that for those valves identified above in the AFW system, the licensee had correctly classified those requiring IST consistent with the requirements of Section XI, IWV.

c. Check Valve Testing

Requirements for full stroke and reverse flow exercising check valves are contained in Section XI, Subsection IWV-3520 of the Code. In addition, specific guidance is contained in positions 2 and 3 of GL 89-04, which discuss forward flow and reverse flow testing. The following check valves in the AFW system were reviewed:

20-0143	20-0243	20-0343	3-20-0140
3-20-0240	3-20-0340	3-20-0456	AFPD-3-0010
AFPD-3-0012	AFPD-3-0014	3-10-0083	3-10-0087
3-10-0375	3-10-0376	3-10-0377	3-10-0381
3-10-0382	3-10-0383	AFSS-0003B	AFSS-0003C
AFSS-3-0005			

The inspector reviewed testing procedures and results and determined that check valve testing was being performed in accordance with the current IST Program. However, significant revisions to the check valve testing procedures were underway due to the generic weaknesses identified in GL 89-04 for full forward flow and reverse flow testing. Although these revisions had not been completed, the inspector discussed the general testing methodology with the licensee, and concluded that the generic weakness would be resolved with the completion of procedural revisions. However, verification of proper implementation of the revised testing procedures would require additional NRC inspection.

The licensee also stated that as part of the overall check valve testing efforts, they were currently investigating the applicability of non-intrusive methods to verify proper check valve performance,



such as ultrasonic testing, acoustic testing, and magnetic flux testing.

Within the areas inspected, no violations or deviations were identified.

3. Bulletin Followup (92701)

(Closed) 50-250,251/85-BU-03, TI 2515/73, Motor Operated Valve Common Mode Failure During Plant Transients Due to Improper Switch Settings

The purpose of this bulletin was to require licensees to develop and implement a program to ensure that switch settings for high pressure coolant injection and emergency feedwater systems' motor-operated valves, subject to testing for operational readiness in accordance with 10 CFR 50.55a(g), are properly set, selected, and maintained.

The licensee's actions in response to this Bulletin had previously been reviewed in NRC Inspection Report 50-250,251/89-07, in which it was noted that some Bulletin action items had not been completed. During this inspection, the inspector reviewed the following root cause and corrective action evaluations for recent MOV failures, which had previously been identified in NRC Inspection Report 50-250,251/89-07 as questionable:

<u>Valve</u>	<u>Date</u>	<u>Description</u>
MOV-6459A	3-15-89	Unable to operate due to thermal overload tripping
MOV-3-863A	6-22-89	Failure to open when given an open signal
MOV-3-1404	7-26-89	Suspected hydraulic locking, intermittent failures
MOV-4-751	11-24-89	Unable to operate due to thermal overload tripping
MOV-3-626	6-7-90	Motor damage while attempting to open

The root cause and corrective action evaluations were timely and technically adequate. Licensee personnel appeared to be knowledgeable in the area of MOV maintenance, failure evaluations, and diagnostic testing. It should be noted that the above valves were contained in the licensee's GL 89-10, Safety-Related Motor-Operated Valve Testing and Surveillance, dated June 28, 1989, MOV program, which is discussed later in this section. The inspector concluded that the licensee had improved in this area.

The inspector also discussed with the licensee their degraded voltage evaluations, which was required by Bulletin 85-03. Inspection Report 89-07 noted that the licensee had formally evaluated MOV operability at 90 percent degraded voltage. Subsequently, informal evaluations based on 80 percent degraded voltage had been performed. The licensee stated that as part of the GL 89-10 program, formal degraded voltage evaluations (80 percent) for Bulletin 85-03 valves and GL 89-10 valves will be performed.

The inspector also reviewed the licensee's efforts for Action Item d of Bulletin 85-03, which required procedures to be prepared or revised to ensure that switch settings are maintained throughout plant life, and provide provisions to monitor valve performance. Review of the MOV procedures revealed that the electrical maintenance procedures provided the necessary instructions to ensure that switch settings were correctly set. Valve performance was currently monitored by the MOV coordinator, and consisted of a history of switch settings, diagnostic testing results, and valve failures. The licensee was currently transporting the valve performance information to a computer data base. The inspector considered the licensee actions in response to Action Item d to be acceptable.

Action Item f required that a written report be issued to the NRC upon completing the Bulletin 85-03 program. The licensee issued the Unit 3 report on January 14, 1988. The Unit 4 report had also been completed. However, GL 89-10 supercedes the recommendations of Bulletin 85-03 and its supplement, and states that licensees need not make any further responses regarding the bulletin and its supplement. As such, the licensee did not submit the Unit 4 report to the NRC.

GL 89-10 was issued to address all safety-related and position-changeable MOVs. GL 89-10 supercedes the actions prescribed in Bulletin 85-03, and thus licensee efforts underway, completed, or yet to be completed will be addressed by GL 89-10.

Documents reviewed totally, or in part, during this inspection included:

O-CME-102.1, Motor Operated Valve Operator Maintenance, dated 3/16/90

O-ADM-709, Equipment Lubrication Guide, dated 4/21/90

O-GME-102.10, Motor Operated Valve Operator, Inspection and Overhaul (SMB-00 and SMB-500), dated 6/12/90

O-GME-102.4, MOVATS Testing of Safety Related Limitorque Motor Operated Valve Actuators

Motor Operated Valve Maintenance Program, Rev. 1, dated 2/1/90

Within the areas inspected, no violations or deviations were identified.

4. Action on Previous Inspection Findings (92701)

- a. (Closed) URI 50-250,251/88-23-01, ICW Pump Flow Adequacy Determination

This item was identified due to a previous review of a Justification for Continued Operation (JCO) of the Intake Cooling Water (ICW) system, and requested an evaluation of system operability based on actual ICW pump performance. The concern was that the JCO evaluation did not consider the actual ICW pump flow rate in the evaluation of Component Cooling Water (CCW) heat exchanger's performance. The inspector reviewed the JCO for Turkey Point Unit 3 ICW System Design, Rev. 3, dated 3-17-89. As stated in the JCO, system operability was established by testing, and utilizing the minimum flow from one ICW pump to two CCW heat exchangers. If the plant alters the ICW system's flow characteristics, such as by adjusting the position of a throttle valve, then a reassessment is performed on the minimum ICW pump flow capability and its effect on the CCW heat exchangers, rather than relying on the results from the previous test. The inspector concluded the licensee had adequately considered the actual pump flow capability in their evaluation.

Within the areas inspected, no violations or deviations were identified.

5. Exit Interview

The inspection scope and results were summarized on June 29, 1990, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results listed above. Proprietary information is not contained in this report. No dissenting comments were received from the licensee.

Licensee management was informed that the following items were closed:

- TI 250,251/2515/73, paragraph 3.
- IEB 85-BU-03, paragraph 3.
- URI 50-250,251/88-23-01, paragraph 4.

