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SUBJECT: Forwards response to Generic Ltr 89-13, "Svc Water Sys Problems Affecting Safety Related Equipment."

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JANUARY 30 1990

L-90-29
10 CFR 50.54 (f)

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
Service Water System Problems Affecting
Safety Related Equipment - Generic Letter 89-13

Generic Letter 89-13, dated July 18, 1989, requested each licensee to confirm that the utility has established a program to implement NRC recommendations one through five of the generic letter. Provided, as an attachment, is the Turkey Point Units 3 and 4 plan and schedule for implementing the recommendations found in this generic letter.

Should there be any questions regarding this subject please contact us.

Very truly yours,

J. H. Goldberg
Executive Vice President

JGH/RG/rh

Attachment

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

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TURKEY POINT UNITS 3 AND 4
RESPONSE TO GENERIC LETTER 89-13

The Turkey Point Plant uses water from a closed cooling canal system as the ultimate heat sink (UHS). The brackish cooling water enters the plant via the intake structure where it is pumped to heat exchangers in various plant systems. The open-cycle service water system at Turkey Point is the Intake Cooling Water (ICW) system. It is composed of two safety related trains supplied by three vertical, single stage, centrifugal 100% capacity ICW pumps which provide cooling for the Component Cooling Water (CCW) system via three 50% capacity heat exchangers. The ICW piping is cast iron with a concrete lining. The CCW heat exchangers are of a single pass shell and straight admiralty brass tube design. ICW cooling water exits the plant to the discharge canal and then to an interconnected closed system of 168 miles of cooling canals with an average length of 5 miles. During transit the water gives up heat to the environment before flowing back to the plant's intake structure. During an accident condition one train of ICW is sufficient to remove safety-related heat loads; non-essential heat loads are isolated from the ICW system by engineered safeguard system actuation.

Turkey Point Plant's plan and schedule for implementing the recommendations of the NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment" are as follows:

RECOMMENDED ACTION I.

For open-cycle service water systems, implement and maintain an ongoing program of surveillance and control techniques to significantly reduce the incidence of flow blockage problems as a result of biofouling.

Response

Turkey Point has reviewed the NRC recommended program to resolve Generic Issue 51 "Proposed Requirements for Improving the Reliability of Open-Cycle Service Water Systems", and due to the unique design of Turkey Point closed cooling water canal system, we have determined that not all aspects of the recommended surveillance and control program are appropriate for Turkey Point Units 3 and 4.

The service water systems do not experience biofouling, excluding grasses, to the extent that results in noticeable flow blockage. Large debris consisting of mostly seaweed and plant material is removed from the canal system before it enters the ICW system by the use of stationary grates at the intake structure and the use of traveling screens which are periodically cleaned by screen wash pumps. Macrofouling and subsequent flow blockage from shellfish, clams and other marine organisms does not occur. Every four hours, monitoring for debris is performed by checking the differential pressure across basket strainers located upstream of the CCW heat exchangers. Backwashing of the basket strainers is performed based on the differential pressure readings to prevent significant flow blockages.

To ensure that flow blockages due to biofouling do not occur in the future, portions of the intake structure and piping will be visually inspected during the 1990 refueling outage on Unit 3. The results of this inspection in combination with prior inspections will determine the scope and frequency of future inspection efforts.

Normal operational configuration of the ICW system maintains both trains of piping and all CCW heat exchangers in service, except for periodic maintenance or testing. Therefore a program to include flushing, flow testing or layup of redundant and infrequently used cooling loops is not required. Similarly, the recommendation of sampling of water and substrate for Asiatic clams is not applicable due to the marine environment.

RECOMMENDED ACTION II.

Conduct a test program to verify the heat transfer capability of all safety related heat exchangers cooled by service water.

Response

At Turkey Point Plant, the CCW heat exchangers are the only safety related heat exchangers that are exposed to the canal water. Periodic efficiency testing is performed to verify that the Unit 3 and Unit 4 CCW heat exchangers are maintained in a satisfactory condition to meet their design/functional requirements. The assigned system engineer is responsible for conducting functional testing of the CCW heat exchangers per OSP-19.4 "CCW Heat Exchanger Performance Monitoring" and OSP-30.4 "CCW Heat Exchanger Performance Test". The test measures ICW flow in addition to ICW and CCW parameters for each heat exchanger.

Test results yield the maximum allowable UHS temperature for each heat exchanger to ensure adequacy in removing design basis heat loads if required. A conservative fouling rate is used to allow graphical comparison between allowable and actual UHS temperature. The difference between the allowable (operating limit) and the actual UHS temperature, is the operating margin. The performance test is used to determine the heat exchanger tube cleaning schedule, and will identify reduced heat exchanger performance resulting from both fouling of heat transfer surfaces or from flow degradation. The procedural controls require testing following heat exchanger cleaning to assess the effectiveness of the cleaning and require immediate notification of the Plant Supervisor - Nuclear if operational limits are approached.

Revised Technical Specifications for the CCW System submitted for Turkey Point (FPL letter 89-201 dated June 5, 1989) have included a new surveillance TS 4.7.2 requiring a verification, at least once per 12 hours, that two heat exchangers and one pump are capable of removing design basis heat loads.

The need for testing closed-cycle system heat exchangers is not considered necessary because of the quality of existing chemistry control programs. Verification of the adequacy of the CCW chemistry control program will be determined by test or visual inspection of heat exchangers cooled by CCW. The Residual Heat Removal (RHR) heat exchangers will be tested by performing a heat balance during a period of significant load. This data will then be analyzed to verify the heat transfer capability of the RHR heat exchangers to meet the design basis heat removal requirement. This analysis will be used to validate any stainless steel heat exchanger cooled by CCW. This analysis will be completed by the end of the dual unit outage scheduled to end in October 1991. A sample of Emergency Containment Cooler heat exchanger tubes will be visually inspected to verify the condition of brass tube heat exchangers. This visual inspection will be performed during the dual unit outage scheduled to end October 1991.

RECOMMENDED ACTION III.

Ensure by establishing a routine inspection and maintenance program for open-cycle service water system piping and components that corrosion, erosion, protective coating failure, silting, and biofouling cannot degrade the performance of the safety-related systems supplied by service water.

Response

Turkey Point Plant performs inspections of the ICW system piping and components. These inspections are normally performed during the refueling outages on a scope and frequency based on past inspection results. As found conditions for the piping and components are documented and repairs made as required.

Past crawl-through inspection results have not indicated problems with significant biofouling. However, corrosion related problems have been identified and corrected. These problems were related to pipe wall thinning and pipe joint degradation. FPL has long term activities in progress to correct the identified ICW piping problems at Turkey Point. Interim actions necessary to adequately monitor piping integrity are in place and are modified as necessary by inspection results.

FPL has previously identified and corrected a concern related to excessive LCO hours on the ICW/CCW system and has established activities incorporating Unit 3 heat exchanger replacement, chemical injection testing, and system engineer involvement to improve the overall performance and availability of the cooling water system. A chemical injection program has been implemented on the Unit 3 CCW heat exchangers to prevent fouling and inhibit corrosion of tube material. Chemical injection is proposed for implementation on the Unit 4 CCW heat exchangers by July 1990.

RECOMMENDED ACTION IV.

Confirm that the service water system will perform its intended function in accordance with the licensing basis for the plant.

Response

Turkey Point Plant has performed a walkdown of the ICW and CCW systems (part of the Select System review described in FPL letter L-86-29 dated January 31, 1986). Operability reviews and/or corrective actions for punchlist items identified during these walkdowns were completed in July 1987. This effort included the design basis reconstitution of selected safety systems, including ICW and CCW, and verified the systems against their design bases.

The Design Basis Documentation (DBD) effort conducted as described in FPL letter L-86-112 dated March 19, 1986 was completed in 1989 and specifically addressed single failure criteria as appropriate to safety related systems. This effort identified single failure vulnerabilities associated with the ICW system related to a potential for temperature control valve failures. The concerns identified have been corrected except for CV-2201 on Unit 3 which is covered under Justification for Continued Operation JCO-86-03. CV-2201 will

be corrected during the 1990 Unit 3 refueling outage by PCM 88-345. In addition, monthly walkdowns are performed on the ICW and CCW systems by the System Engineers. These actions ensure that the ICW and CCW systems will continue to meet their intended function.

RECOMMENDED ACTION V.

Confirm that maintenance practices, operating and emergency procedures, and training that involves the service water system are adequate to ensure that safety related equipment cooled by the service water system will function as intended and that operators of this equipment will perform effectively.

Response

A review to assure the adequacy of maintenance practices, operating and emergency procedures, and training involving service water systems will be completed prior to the end of the dual unit outage scheduled to end October 1991.

STATE OF FLORIDA)
) ss.
COUNTY OF PALM BEACH)

J. H. Goldberg being first duly sworn, deposes and says:

That he is Executive Vice President, of Florida Power & Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensee.

J. H. Goldberg

Subscribed and sworn to before me this
30 day of January, 1990.

Roberta S Economy

NOTARY PUBLIC, in and for the County of Palm Beach, State of Florida

Notary Public, State of Florida
My Commission Expires June 1, 1993
Bonded Thru Troy Fain - Insurance Inc.

My Commission expires _____