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50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251
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SUBJECT: Responds to Generic Ltr 88-17, "Loss of DHR."

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P.O. Box 14000, Juno Beach, FL 33408-0420

FEBRUARY 1 1989

L-89-37

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

Gentlemen:

Re: Turkey Point Units 3 and 4
Generic Letter 88-17
Loss of Decay Heat Removal

Generic Letter 88-17, "Loss of Decay Heat Removal", required licensees to respond to the NRC recommended expeditious actions within 60 days of receipt of the generic letter and to respond to program enhancements within 90 days of receipt of the generic letter. Florida Power & Light Company (FPL) provided the Turkey Point Plant's response to the recommended expeditious actions on January 3, 1989 by our letter L-88-559. In accordance with the generic letter, attached is FPL's response to the programmed enhancements for the Turkey Point Plant.

Should there be any questions concerning this response, please contact us.

Very truly yours,

W. F. Conway
Senior Vice President - Nuclear

WFC/RG/gp

Attachment

cc: Malcolm L. Ernst, Acting Regional Administrator, Region II, USNRC
Senior Resident Inspector, Turkey Point Plant, USNRC



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

W. F. Conway being first duly sworn, deposes and says:

That he is Senior Vice President- Nuclear 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.

W. F. Conway

Subscribed and sworn to before me this
1 day of February, 1989.

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

Notary Public, State of Florida
My Commission Expires June 1, 1989
Bonded Thru Troy Fain - Insurance, Inc.

My Commission expires:

ATTACHMENT 1
Response to Recommended Programmed Enhancements

Recommendation (1) Instrumentation

Provide reliable indication of parameters that describe the state of the RCS and the performance of systems normally used to cool the RCS for both normal and accident conditions. At a minimum, provide the following in the CR:

(a) two independent RCS level indications

(b) at least two independent temperature measurements representative of the core exit whenever the RV head is located on top of the RV (We suggest that temperature indications be provided at all times.)

(c) the capability of continuously monitoring DHR system performance whenever a DHR system is being used for cooling the RCS

(d) visible and audible indications of abnormal conditions in temperature, level, and DHR system performance

Response

(a) Turkey Point currently uses a pressure transmitter calibrated to provide level indication to the control room and input to the plant trend computer. The level system will be modified as follows:

1) visual and audible alarms with an adjustable setpoint will be provided

2) the current system will be changed to use an ultrasonic system or the pressure transmitter will be changed to a differential pressure cell that is referenced back to the RV upper plenum or pressurizer. This will allow for greater accuracy of the level indication system if the RCS pressure is different from the containment pressure.

3) a redundant and independent level channel will be installed with monitoring, alarm and trend capabilities. The design considerations for the modification will address the phenomenon identified in section 3.1.2.1 of enclosure 2 to Generic Letter 88-17.

(b) When in a reduced inventory condition, two independent measurements representative of the core exit temperature will be provided by the existing core exit thermocouples whenever the RV head is located on top of the RV. Under the conditions of concern, these core exit temperature instruments provide adequate indication of core uncovery and overall heat removal capability. FPL will modify this system to provide visual and audible alarms in the control room. Currently, Turkey Point does not have the capability to monitor core exit temperatures when the RV head is removed. Reduced inventory operation will be prohibited when the RV head is removed, except when the RV is defueled.

(c) Modifications will be made to the RHR system instrumentation to improve its capability to monitor RHR system performance as follows:

1) The currently installed fixed low flow alarm will be changed to an alarm with a variable setpoint. In addition, a variable setpoint high flow alarm will be provided.

2) RHR flow indication is currently provided on an inverse logarithmic scale of 0 to 8500 gpm, with 200 gpm increments. The lowest reliable reading is 2000 gpm. This flow indicator will be modified to provide more accurate indication at low flow conditions.

The currently installed RHR temperature trend recorder and local RHR pump suction pressure indicator are adequate to monitor RHR system performance and do not need to be modified.

Taking into consideration the existing instrumentation and the above enhancements, the need for a RHR pump noise monitor will be evaluated. This evaluation will be completed by June 1, 1989.

(d) As discussed above, the reduced inventory instrumentation will include the existing RHR temperature trend recorder and local RHR pump suction pressure indicator as well as the following enhancements:

1) RCS level indication with audible and visual alarms having variable setpoints

2) RCS temperature indication with audible and visual alarms

3) RHR flow indication with high and low flow alarms having variable setpoints

This set of instrumentation will provide adequate audible alarms and panel indication to determine an approach to loss of RHR, evaluate conditions which could jeopardize continued RHR system operation and to determine when RHR cooling has been lost.

**Recommendation (2) Procedures**

Develop and implement procedures that cover reduced inventory operation and that provide an adequate basis for entry into a reduced inventory condition. These include:

(a) procedures that cover normal operation of the NSSS, the containment, and supporting systems under conditions for which cooling would normally be provided by DHR systems.

(b) procedures that cover emergency, abnormal, off-normal, or the equivalent operation of the NSSS, the containment, and supporting systems if an off-normal condition occurs while operating under conditions for which cooling would normally be provided by DHR systems.

(c) administrative controls that support and supplement the procedures in items (a), (b), and all other actions identified in this communication, as appropriate.

**Response**

(a) As stated in FPL's response to recommended expeditious actions, a new procedure will be issued to control operation in a reduced inventory condition. This procedure will include specific requirements for containment closure, required equipment and instrumentation, make up water sources, maintenance restrictions and appropriate administrative controls. This procedure will be based, in part, on the guidance provided by the Westinghouse Owners Group in letter WOG-88-156. The initial version of this procedure will be issued by March 31, 1989. As programmed enhancements identified in this response are completed, this procedure will be revised, as required, to provide for the programmed enhancements. In conjunction with issuance of the new procedure, existing procedures will be revised to include actions/restrictions required prior to, during, and recovering from reduced inventory conditions. These procedure revisions will be completed by March 31, 1989.

(b) Concurrent with development of the new operating procedure described above, the existing operating, off-normal, maintenance and surveillance procedures will be reviewed and revised as necessary to include additional information, requirements and restrictions provided by WOG-88-156. The above procedures will be reviewed to ensure that the entry conditions identified in section 3.2.2.1 of enclosure 2 to Generic Letter 88-17 are adequately considered. The off-normal procedure will be revised by March 31, 1989.

(c) The above procedure changes will provide the necessary administrative controls for containment closure, maintenance restrictions and other requirements as described above to ensure the presently defined scope of Generic Letter 88-17 is met.

**Recommendation (3) Equipment**

(a) Assure that adequate operating, operable, and/or available equipment of high reliability is provided for cooling the RCS and for avoiding a loss of RCS cooling.

(b) Maintain sufficient existing equipment in an operable or available status so as to mitigate loss of DHR or loss of RCS inventory should they occur. This should include at least one high pressure injection pump and one other system. The water addition rate capable of being provided by each equipment item should be at least sufficient to keep the core covered.

(c) Provide adequate equipment for personnel communications that involve activities related to the RCS or systems necessary to maintain the RCS in a stable and controlled condition.

Response

(a) The following enhancements to improve the reliablility of existing plant equipment associated with reduced inventory operation are in progress:

1) upgrade of the RHR pump seals

2) upgrade of the emergency electrical power system

3) upgrade of instrumentation as previously identified in this response

Equipment reliability will be trended using the existing Inservice Testing program and the Nuclear Plant Reliability Data System.

(b) As stated in the FPL response to recommended expeditious actions and above, the new reduced inventory procedure will control the prerequisites and the operating requirements for RCS, RHR and other supporting systems. The requirement for a minimum of one high head safety injection (HHSI) pump, two charging pumps and associated flow paths to the core will be included. This procedure will contain operating techniques provided in WOG-88-156 which will decrease the likelihood of equipment malfunction. In addition, as stated in the response to recommended expeditious actions, the feasibility of defeating the RHR suction valves auto closure interlock will be evaluated. This evaluation will be completed by March 31, 1989.

The off-normal procedure for loss of RHR will include appropriate corrective actions for closure of RHR loop suction valves, use of gravity makeup, use of Steam Generators to provide cooling, and proper guidance for the use of charging and SI pumps.

(c) Following development of the procedures identified in the response to recommendation 2 above, the procedures will be walked down to ensure that adequate communication equipment is available to support normal and off-normal operations. These walkdowns will be completed by May 31, 1989. Where constant communications are required, the procedures will stipulate the specific methods of communications.

Recommendation (4) Analyses

Conduct analyses to supplement existing information and develop a basis for procedures, instrumentation installation and response, and equipment/NSSS interactions and response. The analyses should encompass thermodynamic and physical (configuration) states to which the hardware can be subjected and should provide sufficient depth that the basis is developed. Emphasis should be placed upon obtaining a complete understanding of NSSS behavior under nonpower operation.

Response

Analysis is presently being performed by FPL and the Westinghouse Owners Group (WOG) in order to establish an understanding of NSSS behavior during non-power operation. This analysis includes heat up rates, pressurization rates, venting requirements, containment conditions, containment closure requirements, the

effects of loss of RHR on possible make-up water sources, and improved understanding of RCS level instrumentation response. Additional procedural guidance is expected from the WOG as part of an ongoing effort to upgrade procedures and methods for reduced inventory operation. When available, this information will be reviewed and incorporated, as applicable, into the appropriate administrative controls and operating procedures.

**Recommendation (5) Technical Specifications**

Technical specifications (TSs) that restrict or limit the safety benefit of the actions identified in this letter should be identified and appropriate changes should be submitted.

**Response**

Procedures will be used to provide the necessary administrative controls for equipment operability/availability, containment closure, instrumentation, and RHR flow rate. After a preliminary review of the current Turkey Point Technical Specifications, certain restrictions involving the flow path from the HHSI pumps were identified which may require changes to the Technical Specifications. FPL is in the process of upgrading the current Turkey Point Technical Specifications to the format of the Westinghouse Standardized Technical Specifications. The concerns identified in this Generic Letter and their potential impact on the upgraded Technical Specifications will be discussed with the NRC prior to submittal of the upgraded Technical Specifications.

**Recommendation (6) RCS perturbations**

Item (5) of the expeditious actions should be reexamined and operations refined as necessary to reasonably minimize the likelihood of loss of DHR.

**Response**

The new procedure controlling reduced inventory operation will include a list of the activities which have been identified through Turkey Point and industry events to cause or have the potential to cause perturbations to the RCS or systems required to support reduced inventory operations. Performance of these activities will not be allowed without appropriate management approval.

Prior to performing maintenance and testing activities during reduced inventory conditions, they will be evaluated by the Plant Supervisor - Nuclear to ensure RCS perturbations are minimized. These evaluations will take into consideration allowable decay heat level, special precautions and limitations, communication of activity status to the control room, and possible adverse effects on RCS instrumentation. Procedure changes necessary to implement the above evaluation requirement will be completed by March 31, 1989.

**SCHEDULE**

Above items that require hardware modifications will be scoped, scheduled and included in the Turkey Point Integrated Schedule. For Unit 4, these items will

be completed by the end of the next Unit 4 refueling outage currently scheduled to begin in September, 1990. For Unit 3, these items will be completed by the end of the cycle 13 refueling outage currently scheduled to begin in September, 1991. Hardware modifications that can be completed during the next Unit 3 refueling outage will be identified by April 1, 1989.

## CLARIFICATION OF EXPEDITIOUS ACTION

FPL's response to recommended expeditious action (2) stated, "If openings totaling one square inch or greater exist in the RCS cold legs, Reactor Coolant Pumps (RCP) or intermediate legs, the sum total of time required to obtain containment closure shall not exceed 25 minutes." This restriction applies when the RV upper plenum or RCS hot legs are not vented with a minimum of a 0.5 square foot opening. If a vent path is provided, then the time required to obtain containment closure shall not exceed one hour and 55 minutes.