

February 11, 2002

Mr. J. A. Stall  
Senior Vice President, Nuclear and  
Chief Nuclear Officer  
Florida Power and Light Company  
P.O. Box 14000  
Juno Beach, Florida 33408-0420

SUBJECT: DENIAL OF EXEMPTION REQUEST FOR THE POST-ACCIDENT HYDROGEN MONITORS AND REQUEST TO MODIFY THE REVISED CONFIRMATORY ORDER - TURKEY POINT PLANT, UNITS 3 AND 4 (TAC NOS. MB0332, MB0333, MB1630, AND MB1631)

Dear Mr. Stall:

By letter dated October 23, 2000, Florida Power and Light Company submitted an application to remove the requirements for the hydrogen control systems from the Turkey Point Units 3 and 4 design bases. The submittal consisted of: (1) an exemption request from Title 10, *Code of Federal Regulations* (10 CFR), Section 50.44 and 10 CFR Part 50, Appendix E, Section VI, for the hydrogen recombiner, the post-accident containment (PAC) vent system, and the post-accident hydrogen monitors; (2) proposed license amendments to remove the post-accident containment vent system and the post-accident hydrogen monitors from the Turkey Point Plant, Units 3 and 4, Technical Specifications (TS); and (3) a request to modify the revised Confirmatory Order dated October 5, 2000, to eliminate the commitments made in response to NUREG-0737, Item II.F.1, Attachment 6, "Containment Hydrogen Monitor."

By letter dated December 12, 2001, the U.S. Nuclear Regulatory Commission staff approved your exemption request for the hydrogen recombiner and the PAC vent system. Also, by letter dated December 20, 2001, the staff approved the removal of the requirements for the PAC vent system and the post-accident hydrogen monitors from Turkey Point, Units 3 and 4, TS.

However, the staff has concluded that your request for an exemption from the functional requirements of the post-accident hydrogen monitors, and your request to modify the revised Confirmatory Order issued on October 5, 2000, cannot be approved.

The staff's basis for the denial of these requests is discussed in detail in the enclosed safety evaluation. The post-accident hydrogen monitoring system is needed by the NRC and its licensees to perform their roles during an emergency. Core damage assessment methodologies reviewed by the staff in response to NUREG-0737, Item II.B.3(2)(a), continue to include continuous hydrogen monitoring. Continuous hydrogen monitoring is needed to support a plant's emergency plan. The staff agrees that the present design and quality criteria of the post-accident hydrogen monitors may be overly burdensome, to the extent that the post-accident hydrogen monitors no longer meet the definition of Category 1 or Type A variables, as defined in Regulatory Guide 1.97. Therefore, there is sufficient justification for the staff's action dated December 20, 2001, to approve the removal of the post-accident hydrogen monitors from Turkey Point TS. However, an exemption from the functional requirements of the post-accident hydrogen monitors, and the deletion of commitments in the revised Confirmatory Order made in response to NUREG-0737, Item II.F.1, Attachment 6, "Containment Hydrogen Monitor," cannot be supported because the staff finds that continuous hydrogen monitoring is required.

J. A. Stall

In summary, the staff concludes that your request for an exemption from the functional requirements of the post-accident hydrogen monitors cannot be approved. Similarly, your request to modify the Confirmatory Order dated March 14, 1983, and revised by NRC letter dated October 5, 2000, to delete the commitments to NUREG-0737, Item II.F.1, Attachment 6, Containment Hydrogen Monitor requirements, is denied.

Should you have any comments regarding this matter, please contact the Turkey Point Project Manager, Kahtan Jabbour at 301-415-1496.

Sincerely,

**/RA/**

John A. Zwolinski, Director  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-250 and 50-251

Enclosure:  
Safety Evaluation

cc w/encls: See next page

February 11, 2002

In summary, the staff concludes that your request for an exemption from the functional requirements of the post-accident hydrogen monitors cannot be approved. Similarly, your request to modify the Confirmatory Order dated March 14, 1983, and revised by NRC letter dated October 5, 2000, to delete the commitments to NUREG-0737, Item II.F.1, Attachment 6, Containment Hydrogen Monitor requirements, is denied.

Should you have any comments regarding this matter, please contact the Turkey Point Project Manager, Kahtan Jabbour at 301-415-1496.

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John A. Zwolinski, Director  
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
DENIAL OF EXEMPTION REQUEST FOR POST-ACCIDENT HYDROGEN MONITORS AND  
REQUEST TO MODIFY  
REVISED CONFIRMATORY ORDER  
FLORIDA POWER AND LIGHT COMPANY  
TURKEY POINT PLANT, UNITS 3 AND 4  
DOCKET NOS. 50-250 AND 50-251

1. INTRODUCTION

By letter dated October 23, 2000, Florida Power and Light Company (FPL) submitted an application to remove the requirements for the hydrogen control systems from the Turkey Point Plant, Units 3 and 4, design bases. The submittal consisted of: (1) an exemption request from Title 10, *Code of Federal Regulations* (10 CFR), Section 50.44 and 10 CFR 50, Appendix E, Section VI, for the recombiner, the post-accident containment vent system, and the post-accident hydrogen monitors; (2) proposed license amendments to remove the post-accident containment (PAC) vent system and the post-accident hydrogen monitors from the Turkey Point Plant, Units 3 and 4, Technical Specifications (TS); and (3) a request to modify the revised Confirmatory Order dated October 5, 2000, to eliminate the commitments made in response to NUREG-0737, Item II.F.1, Attachment 6, "Containment Hydrogen Monitor." The October 5, 2000, Order revised a Confirmatory Order issued to FPL on March 14, 1983, which had required the licensee to establish monitoring of hydrogen concentration in the containments within 30 minutes of the initiation of safety injection. The October 5, 2000, Order allows the licensee the option of maintaining the 30-minute time limit, or using risk-informed insights to determine the functional requirements for monitoring of containment hydrogen concentration, thereby potentially extending the monitoring requirement time-limit to more than 30 minutes following initiation of safety injection.

By letter dated December 12, 2001, the U.S. Nuclear Regulatory Commission (NRC) staff approved FPL's requested exemption from the hydrogen recombiner and the PAC vent system requirements. Also, by letter dated December 20, 2001, the staff approved FPL's requested removal of the requirements for the PAC vent system and the post-accident hydrogen monitors from the Turkey Point, Units 3 and 4, TS. The staff did not approve FPL's other requests.

This safety evaluation sets forth the staff's basis for denying FPL's remaining requests, specifically its request for an exemption from the functional requirements of the post-accident hydrogen monitors, and its associated request to modify the revised Confirmatory Order dated

**Enclosure**

October 5, 2000, to eliminate the commitments contained therein pertaining to monitoring of the hydrogen concentration in the containments following a safety injection.

## 2. EVALUATION

In its October 23, 2000, submittal, FPL asserts that the containments of Turkey Point Plant, Units 3 and 4, have sufficient safety margins against hydrogen burns following design basis and severe accidents without use of the hydrogen monitoring or concentration control systems. Additionally, the Turkey Point Probabilistic Risk Assessment indicates that none of the accident sequences addressed that could realistically threaten containment due to hydrogen combustion are impacted by the hydrogen monitoring or concentration control systems. NRC-sponsored studies, such as NUREG-1150 and NUREG/CR-5662, also have found hydrogen combustion to be a small contributor to containment failure for large, dry containment designs due to the robustness of these containment types and the likelihood of a spurious ignition source.

Notwithstanding these conclusions, the staff does not support FPL's request for a full exemption from the requirement for post-accident hydrogen monitoring as promulgated in Part 50, Appendix E, Section VI, "Emergency Response Data System (ERDS)," or its request for elimination of commitments made in regard to NUREG-0737, Item II.F.1, Attachment 6, "Containment Hydrogen Monitor." The staff's position is based on several considerations. First, in the Statement of Considerations for Appendix E to Part 50, the Commission stated that the ERDS data (which include data from the continuous hydrogen monitors) provide information required by the NRC to perform its role during an emergency. This conclusion is still valid and reflects consideration of both the staff and licensee roles in responding to an emergency.

Second, the nuclear steam supply system vendors' core damage assessment methodologies continue to include continuous hydrogen monitoring. For purposes of estimating the degree of core damage, the post-accident hydrogen monitors are more accurate than containment radiation monitors because they are not sensitive to fission product decay and removal. Core damage assessment methodologies which included hydrogen monitoring were reviewed and found to be acceptable by the staff in response to NUREG-0737, Item II.B.3(2)(a).

Third, continuous hydrogen monitoring is needed to support a plant's emergency plan as described in 10 CFR 50.47(b)(9). Implementing guidance documents such as Regulatory Guide (RG) 1.101, Revision 2, which endorsed NUREG-0654, and RG 1.101, Revision 3, which endorsed NUMARC-NESP-007, Revision 2, define the highest Emergency Action Level—a General Emergency—as a loss of any two barriers and the potential loss of a third barrier. Potential loss of a third barrier includes evaluating whether or not an explosive mixture exists inside containment. The continuous hydrogen monitoring is needed to confirm that spurious ignition has taken place and that an explosive mixture that could threaten containment does not exist. Generic severe accident management guidelines include the concentration of hydrogen in containment, along with other indicators and factors, when considering the possibility of containment venting.

Based on the foregoing considerations, the staff finds that it cannot support the licensee's request for exemption from the functional requirements for hydrogen monitoring or its request to modify the revised Confirmatory Order dated October 5, 2000, so as to eliminate the commitments made in response to NUREG-0737, Item II.F.1, Attachment 6, "Containment Hydrogen Monitor."

As a matter of clarification, the staff notes that it did find sufficient justification for the removal of

the post-accident hydrogen monitors from the Turkey Point TS because they no longer meet the definition of either a Category 1 or Type A variables as defined in RG 1.97. Currently, the post-accident hydrogen monitors are retained in TS because they are classified as Category 1 or Type A variables. NUREG-1431, Revision 2, "Standard Technical Specifications - Westinghouse Plants," states, "PAM [post accident monitoring] instrumentation that meets the definition of Type A in Regulatory Guide 1.97 satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). Category I, non-type A, instrumentation must be retained in TS because it is intended to assist operators in minimizing the consequences of accidents. Therefore, Category 1, non-Type A, variables are important for reducing public risk." RG 1.97 defines Type A variables as those that provide primary information needed to permit the control room operating personnel to take the specified manually controlled actions for which no automatic control is provided and that are required for safety systems to accomplish their safety functions for design basis accident events.

The exemption issued on December 12, 2001, concludes that the plant could withstand the consequences of uncontrolled hydrogen-oxygen recombination without loss of safety function and without credit for the hydrogen recombiner or the hydrogen purge system for design basis accident events. Therefore, the post-accident hydrogen monitors no longer meet the definition of a Type A variable as defined in RG 1.97. Section 4.3.1 of Attachment 2 to SECY-00-198 concludes that failure of large, dry containments due to hydrogen combustion is not a significant contributor to public risk. This conclusion is based on the robustness of these containment types and the likelihood of a spurious ignition source. Moreover, operator action is not credited or anticipated for design basis events as well as beyond design basis accidents that have been analyzed. Therefore, for large, dry containments, the post-accident hydrogen monitors also no longer meet the definition of Category 1 variable as defined in RG 1.97. Accordingly, because post-accident hydrogen monitors no longer meet the definition of either a Category 1 or Type A variable as defined in RG 1.97, the staff found that they could be removed from the Turkey Point TS.

As discussed above, the staff has concluded that the post-accident hydrogen monitors no longer meet the RG 1.97 definition of Category 1 variable. RG 1.97 also recognizes the Category 3 variable, which is intended to ensure that high-quality off-the-shelf instrumentation is obtained and applies to backup and diagnostic instrumentation. The staff notes that Category 3 is a more appropriate categorization for the post-accident hydrogen monitors, as they are needed primarily to assess the degree of core damage, confirm that spurious ignition has taken place, and confirm that containment integrity is not threatened by an explosive mixture. Indeed, the staff has identified these particular functions in discussing the basis for its denial of the licensee's requests evaluated above.

### 3. CONCLUSION

The staff denies the licensee's request for an exemption from the functional requirements for post-accident hydrogen monitoring, and request to modify the revised Confirmatory Order dated October 5, 2000, to eliminate the commitments made in response to NUREG-0737, Item II.F.1, Attachment 6, Containment Hydrogen Monitor.

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Date: February 11, 2002

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