March 20, 2003

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: TURKEY POINT UNIT 3 — RELAXATION OF THE REQUIREMENTS OF ORDER (EA-03-009) REGARDING REACTOR PRESSURE VESSEL HEAD INSPECTIONS (TAC NO. MB7990)

Dear Mr. Stall:

The U.S. Nuclear Regulatory Commission has approved the enclosed request for relaxation of the specific requirements of Order EA-03-009, requiring specific inspections of the reactor pressure vessel (RPV) and associated penetration nozzles at pressurized water reactors, for Turkey Point Unit 3. This Relaxation is in response to your letter dated March 11, 2003, as supplemented by a letter dated March 14, 2003. Florida Power and Light has requested Relaxation for Turkey Point Unit 3, of the requirements to perform the prescribed ultrasonic testing (UT) inside the tube from 2 inches above the J-groove weld to the bottom of the penetration for nine RPV head penetrations. Specifically, this Relaxation allows the UT examination, with less than full coverage, for nine RPV nozzles. The areas on each nozzle with less than full coverage are located in a non-pressure boundary portion of the nozzle that is greater than 1 inch below the J-groove weld to the bottom of the nozzle. This acceptance is contingent upon one condition described in the enclosed Safety Evaluation report.

If there are any questions concerning this approval, please to contact Ms. Eva Brown at (301) 415-2315.

Sincerely,

/RA/

Scott W. Moore, Acting Director
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-250

Enclosure: As stated

cc w/encl: See next page

March 20, 2003

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: TURKEY POINT UNIT 3 — RELAXATION OF THE REQUIREMENTS OF ORDER (EA-03-009) REGARDING REACTOR PRESSURE VESSEL HEAD INSPECTIONS (TAC NO. MB7990)

Dear Mr. Stall:

The U.S. Nuclear Regulatory Commission has approved the enclosed request for relaxation of the specific requirements of Order EA-03-009, requiring specific inspections of the reactor pressure vessel (RPV) and associated penetration nozzles at pressurized water reactors, for Turkey Point Unit 3. This Relaxation is in response to your letter dated March 11, 2003, as supplemented by a letter dated March 14, 2003. Florida Power and Light has requested Relaxation for Turkey Point Unit 3, of the requirements to perform the prescribed ultrasonic testing (UT) inside the tube from 2 inches above the J-groove weld to the bottom of the penetration for nine RPV head penetrations. Specifically, this Relaxation allows the UT examination, with less than full coverage, for nine RPV nozzles. The areas on each nozzle with less than full coverage are located in a non-pressure boundary portion of the nozzle that is greater than 1 inch below the J-groove weld to the bottom of the nozzle. This acceptance is contingent upon one condition described in the enclosed Safety Evaluation report.

If there are any questions concerning this approval, please to contact Ms. Eva Brown at (301) 415-2315.

Sincerely,

/RA/

Scott W. Moore, Acting Director
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-250

Enclosure: As stated

cc w/encl: See next page

Distribution:

PUBLIC	E. Brown	A. Howe	OGC	ACRS
PDII-2 R/F	B. Clayton (Hard Copy)	S. Moore	T. Chan	J. Zwolinski/ T. Marsh
W. Bateman	A. Hiser	J. Collins	R. Barrett	B. Sheron
W. Borchardt	S. Collins	S. Vias, RII	J. Munday	G. Hill (2)
L. Plisco, RII	B. Smith, EDO	S. Bloom		

ADAMS ACCESSION NUMBER: ML030790501 *See previous concurrence page

OFFICE	PDII-2/PM	PDII-2/LA	PDII-2/SC	OGC*	PDII/D(A)
NAME	EBrown	BClayton	AHowe	GLongo	SMoore
DATE	3/20/03	3/20/03	03/20/03	3/20/03	03/20/03

OFFICIAL RECORD COPY

Mr. J. A. Stall
Florida Power and Light Company

TURKEY POINT PLANT

cc:
M. S. Ross, Attorney
Florida Power & Light Company
P.O. Box 14000
Juno Beach, FL 33408-0420

Attorney General
Department of Legal Affairs
The Capitol
Tallahassee, Florida 32304

Site Vice President
Turkey Point Nuclear Plant
Florida Power and Light Company
9760 SW. 344th Street
Florida City, FL 33035

T. O. Jones, Plant General Manager
Turkey Point Nuclear Plant
Florida Power and Light Company
9760 SW. 344th Street
Florida City, FL 33035

County Manager
Miami-Dade County
111 NW 1 Street, 29th Floor
Miami, Florida 33128

Walter Parker
Licensing Manager
Turkey Point Nuclear Plant
9760 SW 344th Street
Florida City, FL 33035

Senior Resident Inspector
Turkey Point Nuclear Plant
U.S. Nuclear Regulatory Commission
9762 SW. 344th Street
Florida City, Florida 33035

Mr. William Jefferson
Vice President, Nuclear Operations Support
P.O. Box 14000
Juno Beach, FL 33408-0420

Mr. William A. Passetti, Chief
Department of Health
Bureau of Radiation Control
2020 Capital Circle, SE, Bin #C21
Tallahassee, Florida 32399-1741

Mr. Rajiv S. Kundalkar
Vice President - Nuclear Engineering
Florida Power & Light Company
P.O. Box 14000
Juno Beach, FL 33408-0420

Mr. Craig Fugate, Director
Division of Emergency Preparedness
Department of Community Affairs
2740 Centerview Drive
Tallahassee, Florida 32399-2100

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELAXATION OF FEBRUARY 11, 2003, ORDER (EA-03-009)

REACTOR PRESSURE VESSEL HEAD INSPECTIONS

FLORIDA POWER AND LIGHT

TURKEY POINT NUCLEAR PLANT, UNIT 3

DOCKET NO. 50-250

1.0 INTRODUCTION

By letter dated March 11, 2003, as supplemented by a letter dated March 14, 2003, Florida Power and Light (the licensee) submitted a request for relaxation, in accordance with Section IV, paragraph F(2) of Order EA-03-009 for Turkey Point Unit 3, of the requirements contained in Section IV, paragraphs C.(1)(b)(i) of Order EA-03-009 issued by the U.S. Nuclear Regulatory Commission (NRC) staff on February 11, 2003. Relaxation was requested for one 18-month operating cycle. The errata to Order EA-03-009, issued March 14, 2003, do not affect the technical issues raised in the Relaxation request.

The basis for the licensee's request was that compliance with Order EA-03-009 for nine reactor pressure vessel (RPV) head penetrations would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The licensee has requested relaxation of the requirements to perform the prescribed ultrasonic testing (UT) inside the tube from 2 inches above the J-groove weld to the bottom of the penetration for nine RPV head penetrations. Specifically, the Relaxation would allow the UT examination, with less than full coverage, for nine RPV nozzles. The areas on each nozzle with less than full coverage are located in a nonpressure boundary portion of the nozzle that is greater than 1 inch below the weld to the bottom of the nozzle.

2.0 REGULATORY EVALUATION

Order EA-03-009, issued on February 11, 2003, requires specific examinations of the RPV head and vessel head penetration (VHP) nozzles of all pressurized water reactor plants. Section IV, paragraph F, of the Order states that requests for Relaxation of the Order associated with specific penetration nozzles will be evaluated by the NRC staff using the procedure for evaluating proposed alternatives to the American Society of Mechanical Engineers Code in accordance with Title 10 of the *Code of Federal Regulations* Section 50.55a(a)(3). Section IV, paragraph F, of the Order states that a request for Relaxation regarding inspection of specific nozzles shall address the following criteria: (1) the proposed

alternative(s) for inspection of specific nozzles will provide an acceptable level of quality and safety, or (2) compliance with this Order for specific nozzles would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Turkey Point Unit 3 was determined to have a high susceptibility to primary water stress-corrosion cracking (PWSCC) in accordance with Section IV, paragraphs A and B, of the Order.

3.0 TECHNICAL EVALUATION

3.1 Components for Which Relaxation is Requested

The licensee has requested relaxation of Section IV, paragraph C.(1)(b)(i) of the Order for nine VHP nozzles, including numbers 14, 16, 25, 28, 31, 43, 63, 64, and 67.

3.2 Order Requirements for Which Relaxation is Requested

For Turkey Point Unit 3, and similar plants determined to have a high susceptibility to PWSCC in accordance with Section IV, paragraphs A and B, of the Order, the following inspections are required to be performed every refueling outage in accordance with Section IV, paragraph C.(1) of the Order:

(a) Bare metal visual (BMV) examination of 100 percent of the RPV head surface (including 360° around each RPV head penetration nozzle), and

(b) Either:

(i) UT of each RPV head penetration nozzle (i.e., nozzle base material) from 2 inches above the J-groove weld to the bottom of the nozzle and an assessment to determine if leakage has occurred into the interference fit zone, or

(ii) Eddy current testing or dye penetrant testing of the wetted surface of each J-Groove weld and RPV head penetration nozzle base material to at least 2 inches above the J-groove weld.

Footnote 3 of the Order provides specific criteria for examination of repaired VHP nozzles.

3.3 Licensee's Proposed Alternative

The proposed alternate examination is to perform an UT examination to include 2 inches above the weld to at least 1 inch below the weld.

3.4 Licensee's Basis for Relaxation

The licensee stated that gaining access to perform examination of the nine VHP nozzles would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. In particular, a physical modification, such as removal of sleeves inside of these nozzles, or the development of new equipment would be required to implement an inspection in

accordance with Section IV, paragraph C.(1)(b)(i), of the Order. As described in Attachment 2 of the supplement to the licensee's request dated March 14, 2003, the effect of not performing the inspection for which relaxation is requested is negligible on the level of quality and safety. Due to the low stresses in these portions of the nozzles and the corresponding low crack growth rates, the licensee indicates that there are no concerns with the structural integrity of the VHP nozzles from the unexamined portions of the nozzles addressed in their request.

3.5 Evaluation

The NRC staff's review of this request was based on criterion (2) of paragraph F of Section IV of the Order, which states:

> Compliance with this Order for specific nozzles would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Within the context of the licensee's proposed alternative examination of the RPV penetration nozzles, the licensee has demonstrated the hardship that would result from implementing examinations to the bottom end of these nozzles. The staff agrees that the nozzles' geometry makes inspection of these nozzles in accordance with Order EA-03-009 very difficult and would involve a hardship. This evaluation focuses on the issue of whether there is a compensating increase in the level of quality and safety such that these nozzles should be inspected despite this hardship.

The licensee's request to limit examination of the nozzle base material inner surface to 1 inch below the weld is appropriately supported by the licensee's analysis which demonstrated that no flaw below that portion of the nozzle would propagate to a level adjacent to the J-groove weld within an 18-month operating period. This analysis used the approach described in Footnote 1 of the Order as the criteria to set the necessary height of the surface examination. However, the licensee's analysis uses a crack growth formula from the Electric Power Research Institute Report, "Material Reliability Program (MRP) Crack Growth Rates for Evaluating Primary Water Stress Corrosion Cracking (PWSCC) of Thick Wall Alloy 600 Material (MRP-55), Revision 1" which is different than that described in Footnote 1 of Order EA-03-009. The NRC staff is currently evaluating this report and has not made an assessment regarding the acceptability of the report. Should the NRC staff find the crack growth formula used by the licensee to be unacceptable, the licensee will be required to revise its analysis to incorporate an acceptable crack growth formula.

The safety issues that are addressed by the inspections mandated by Order EA-03-009 are degradation (corrosion) of the low-alloy steel RPV head and ejection of the VHP nozzle due to circumferential cracking of the nozzle above the J-groove weld. The following three items provide reasonable assurance that these safety issues are addressed:

1. The BMV examination performed by the licensee directly demonstrated the integrity of the RPV head and the absence of ongoing degradation of the head.

2. The licensee's analysis, which demonstrates that no flaw located within the unexamined portion of the nozzles (i.e., more than 1 inch below the J-groove weld) would propagate to a level adjacent to the weld within an 18-month operating period, provides sufficient justification that there is a very low likelihood of through wall leakage or possible

degradation of the low-alloy steel RPV head, due to such a flaw, prior to the next inspection.

3. The UT examination of 55 of the 64 RPV head penetration nozzles in accordance with Section IV, paragraph C.(1)(b)(i), of the Order and the remaining nine RPV head penetration nozzles from 2 inches above the weld to greater than or equal to 1 inch below the weld reasonably demonstrates that the RPV head penetration nozzles are intact throughout the region of inspection. This examination provides reasonable assurance that no circumferential cracking of the nozzle above the J-groove weld is present and no through wall leakage and degradation of the RPV head should occur.

The inspections proposed by the licensee combined with an evaluation of the effects of postulated cracks in the areas below 1-inch (e.g., crack growth analysis) provide reasonable assurance of adequate protection of the public health and safety.

3.6 Condition

This authorization has one condition. Should the NRC staff find the crack growth formula described in industry report MRP-55 to be unacceptable, the licensee will be required to revise its analysis that justifies no examination of the nozzle inside diameter surface greater than 1 inch below the J-groove weld.

4.0 CONCLUSION

The NRC staff concludes that inspection of the nine VHP nozzles in accordance with Section IV, paragraph C.(1)(b), of Order EA-03-009, would result in hardship without a compensating increase in the level of quality and safety. Further, the staff concludes that the licensee's proposed alternative examination of nine RPV head penetration nozzles to a level at least one inch below the J-groove weld provides reasonable assurance of the structural integrity of the RPV head, VHP nozzles, and welds. However, the NRC staff notes that this acceptance is based not only on the licensee's arguments, but on the criterion identified herein.

Should the NRC staff find the crack growth formula described in industry report MRP-55 to be unacceptable, the licensee shall revise its analysis that justifies no examination of the nozzle outside surface more than 1 inch below the J-groove weld.

Therefore the NRC staff finds that inspection of these VHP nozzles in accordance with Section IV, paragraph C.(1)(b), of Order EA-03-009 would result in hardship without a compensating increase in the level of quality and safety, and authorizes, pursuant to Section IV, paragraph F, of Order EA-03-009, the alternative proposed by the licensee for VHP head penetration nozzles numbers 14, 16, 25, 28, 31, 43, 63, 64, and 67 at Turkey Point Unit 3.

Principal Contributor: Allen Hiser, NRR

Date: March 20, 2003