

MARCH 8 1978

Docket No. 50-251

Florida Power & Light Company
ATTN: Dr. Robert E. Hhrig
Vice President
Post Office Box 013100
Miami, Florida 33101

Gentlemen:

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Enclosed is a signed original of an Order for Modification of License, dated March 8, 1978, issued by the Commission for Turkey Point, Unit No. 4. This Order amends paragraph 3.D of the Turkey Point, Unit No. 4 Facility Operating License DPR-41 and permits continued operation of Turkey Point, Unit No. 4, for an additional six (6) equivalent full power months of operation.

Our related Safety Evaluation is enclosed. A copy of the Order is being filed with the Office of the Federal Register for publication.

Sincerely,

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosure:

1. Order for Modification of License
2. Safety Evaluation

cc w/enc1:
See next page

SEE PREVIOUS YELLOW FOR CONCURRENCES

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Docket No. 50-251

Florida Power & Light Company
 ATTN: Dr. Robert E. Uhrig
 Vice President
 P. O. Box 013100
 Miami, Florida 33101

Gentlemen:

Enclosed is a signed original of an Order for Modification of License, dated March 8, 1977, issued by the Commission for Turkey Point Unit No. 4. This Order amends paragraph 3.0 of the Turkey Point Unit No. 4 Facility Operating License DPK-41 and permits continued operation of Turkey Point Unit No. 4 for an additional six (6) equivalent full power months of operation.

Our related Safety Evaluation is enclosed. A copy of the Order is being filed with the Office of the FEDERAL REGISTER for publications.

Sincerely,

A. Schwencer, Chief
 Operating Reactors Branch #1
 Division of Operating Reactors

Enclosure:

- Order for Modification of License
- Safety Evaluation

cc w/enclosure:
 see next page

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 SUBJECT TO CONCURRENT
 ISSUANCE OF AMENDMENT
 RE: EGCS EVALUATION

ORB#1
 CParrish *Lead for CP*
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OFFICE	ORB#1 <i>OK</i>	OELD <i>OK</i>	ORB#1 <i>OK</i>	AD/ORS <i>KRG</i>	OB/DOR <i>VS/John</i>	A.E./NBR
SURNAME	MGrotenhuis:acr	<i>S. LUDWIG</i>	ASchwencer	KRGoller	VS/John	EGCase
DATE	3/ 8 178	3/ 8 178	3/ 8 178	3/ 8 178	3/ 8 178	3/ 8 178



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

March 8, 1978

Docket No. 50-251

Florida Power & Light Company
ATTN: Dr. Robert E. Uhrig
Vice President
Post Office Box 013100
Miami, Florida 33101

Gentlemen:

Enclosed is a signed original of an Order for Modification of License, dated March 8, 1978, issued by the Commission for Turkey Point, Unit No. 4. This Order amends paragraph 3.D of the Turkey Point, Unit No. 4 Facility Operating License DPR-41 and permits continued operation of Turkey Point, Unit No. 4, for an additional six (6) equivalent full power months of operation.

Our related Safety Evaluation is enclosed. A copy of the Order is being filed with the Office of the Federal Register for publication.

Sincerely,

A handwritten signature in cursive script, appearing to read "A. Schwencer".

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosure:

1. Order for Modification
of License
2. Safety Evaluation

cc w/encl:
See next page

Florida Power & Light Company

- 2 - March 8, 1978

cc: Mr. Robert Lowenstein, Esquire
Lowenstein, Newman, Reis & Axelrad
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Washington, D.C. 20036

Environmental & Urban Affairs
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Miami, Florida 33199

Mr. Norman A. Coll, Esquire
Steel, Hector and Davis
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Miami, Florida 33131

Bureau of Intergovernmental
Relations
660 Apalachee Parkway
Tallahassee, Florida 32304

Honorable Dewey Knight
County Manager of Metropolitan
Dade County
Miami, Florida 33130

Florida Power & Light Company
ATTN: Mr. Henry Yaeger, Plant Manager
Turkey Point Plant
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Miami, Florida 33101

Chief, Energy Systems
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U.S. Environmental Protection Agency
Region VI Office
ATTN: EIS COORDINATOR
345 Courtland Street, NW
Atlanta, Georgia 30308

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
FLORIDA POWER AND LIGHT COMPANY) Docket No. 50-251
Turkey Point Plant Unit No. 4)

ORDER FOR MODIFICATION OF LICENSE

I.

The Florida Power and Light Company (the Licensee) is the holder of Facility Operating License No. DPR-41 which authorizes the operation of the nuclear power reactor known as Turkey Point Unit No. 4 (the facility) at steady state reactor power levels not in excess of 2200 thermal megawatts (rated power). The facility is a pressurized water reactor (PWR) located at the Licensee's site in Dade County, Florida.

II.

On February 8, 1977, the Nuclear Regulatory Commission ordered Turkey Point Unit No. 4 to perform an inspection of steam generators at the end of the then current fuel cycle or within 120 equivalent days of power operation from February 8, 1977, whichever occurred first. On May 3, 1977, the Nuclear Regulatory Commission issued a supplementary Order granting approval for resumption of reactor operation until the end of the third fuel

cycle and continuing the other requirements of the Order of February 8, 1977, in force. On August 3, 1977, the Nuclear Regulatory Commission issued an Order for Modification of License permitting continued operation of Turkey Point Unit No. 4 for six equivalent months of Cycle 4 operation. On August 11, 1977, an Order was issued correcting the Order of August 3, 1977. On February 10, 1978, an Order was issued permitting an additional six equivalent weeks of operation and on February 17, 1978, an Order was issued to authorize operation of Unit No. 4 from February 11, 1978 to February 14, 1978, with a limit of 0.35 gpm of primary to secondary leakage through any steam generator. On February 14, 1978, Turkey Point Unit No. 4 was shutdown for inspection of the three steam generators in accordance with the above Orders. The Orders required Nuclear Regulatory Commission approval before resuming reactor power operation after the shutdown.

On March 1, 1978, the Licensee submitted a report describing the results of their inspections and tests of the steam generators, as well as their analysis and evaluation of the data. The NRC staff has evaluated this information and has assessed continued operation of the facility. This evaluation is set forth in a concurrently issued Safety Evaluation Report. The licensee also submitted a revised ECCS performance analysis taking into account additional tube plugging. Based on its review, the staff has concluded that operation of the facility, under

the conditions previously imposed, may be continued for an additional period of six months and that the limitations contained in this Order will provide reasonable assurance that the public health and safety will not be endangered by continued operation of Unit No. 4. This Order continues in effect the leakage and radioiodine concentration limits previously imposed.

Copies of the following documents are available for public inspection in the Commission's Public Document Room, 1717 H Street, NW., Washington, D.C. 20555 and at the Environmental and Urban Affairs Library, Florida International University, Miami, Florida: (1) the licensee's report of the steam generator inspections dated March 1, 1978, and the request for further operation dated March 3, 1978, (2) this Order for Modification of License, In the Matter of Florida Power and Light Company (Turkey Point Plant, Unit No. 4), Docket No. 50-251, and (3) our Safety Evaluation Report dated March 8, 1978, applicable to our Order dated March 8, 1978.

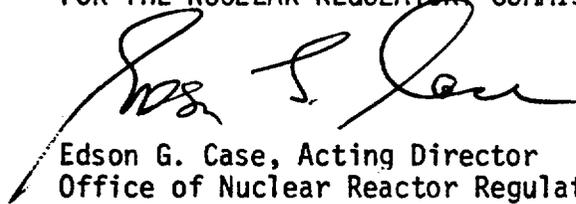
III.

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's Rules and Regulations in 10 CFR Parts 2 and 50, IT IS ORDERED THAT paragraph 3.D.1 of Facility Operating License No. DPR-41 is hereby amended to read as follows:

D. Steam Generator Operation

1. Turkey Point Unit No. 4 shall be brought to the cold shutdown condition in order to perform an inspection of the steam generators after six (6) additional equivalent full power months of operation. Nuclear Regulatory Commission approval shall be obtained before resuming power operation following this inspection. For the purpose of this requirement, equivalent operation is defined as operation with a primary coolant temperature greater than 350°F.

FOR THE NUCLEAR REGULATORY COMMISSION



Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation

Dated in Bethesda, Maryland
this 8th day of March 1978



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING ORDER FOR MODIFICATION OF LICENSE

FLORIDA POWER AND LIGHT COMPANY

TURKEY POINT NUCLEAR GENERATING UNIT NO. 4

DOCKET NO. 50-251

INTRODUCTION

By letter dated March 1, 1978, Florida Power and Light Company (FPL) submitted the results of the steam generator tube inspection performed at Turkey Point Unit 4 during its February 1978 outage including the plugging criteria applied to the three steam generators. Based on these inspection results, the implemented plugging patterns, and previously submitted ECCS analysis, FPL concludes that the facility can be returned to full power operation for at least another six (6) effective months.

Turkey Point 4 has been operating under an NRC Order for Modification of Facility Operating License DPR-41, dated August 3, 1977, and an extension to that Order dated February 10, 1978. On February 17, 1978, a supplementary Order was issued to confirm authorization as an emergency relief to operate up to a 0.35 gpm primary to secondary leak rate for a limited period of time. Prior to reaching the 0.35 gpm limit, Turkey Point Unit No. 4 was shutdown and, rather than bring the unit back to power for the period of time authorized by the February 10, 1978 extension, the licensee elected to perform the previously scheduled major steam generator tube inspection and to conduct preventive tube plugging. Both the August 3, 1977 Order and February 10, 1978 extension to that Order required that following the steam generator tube inspections NRC approval be obtained prior to resuming power operation.

DISCUSSION AND EVALUATION

Inspection Program

The steam generator tube inspection program performed during this shutdown was almost entirely devoted to assessing the conditions associated with the "denting" problem. Tube gauging was done in all three steam generators in order to assess the extent and pattern of tube denting. On the hot leg side, all tubes near the tubelane which are predicted to be bounded by the 12.5% hoop strain contour were gauged. Based on previous leaker history at Turkey Point Unit 4 and similar units, as well as previous gauging results, the gauging program also included wedge and patch plate regions. Additionally, the gauging would go two rows or columns beyond any tube restricting a 0.650" probe in the tube lane and wedge regions, and two tubes on either side of a tube that did not allow passage of the 0.650"

probe in the patch plate region. Some gauging was also performed on cold leg tubes in generators 4B and 4C in conjunction with the U-bend inspection program conducted on the cold leg side of generator 4C.

Results of Inspection and Corrective Action

At the time the unit was shutdown it was operating with approximately a 0.33 gpm primary to secondary leak rate in steam generator 4A. The subsequent hydrotesting determined the leak to be at the sixth support plate in the tube at location R2C75. This tube did not allow passage of a 0.540" probe beyond the fifth support plate. This finding confirms the conclusion drawn in our safety evaluation of February 17, 1978 concerning the probable cause of this leak.

Hydrotesting also uncovered several other very slow leaks. A "weeping" tube, at location R21C43 in steam generator 4C, and several tubes around it were eddy current inspected using a 0.700" probe. Neither the inspection nor hydrotest could locate any crack along the tube. FPL has concluded that the leak is probably due to wastage caused by phosphate. Because the tube passed the 0.700" probe and is located in an area where wastage has been known to have occurred in the past, the leak cannot be related to the denting problem. Due to the interference found in eddy current signals when inspecting inside the tubesheet and sludge pile regions, it is most probable that the leak is from somewhere in this area of the tube. The extremely slow leak rate is characteristic of a tight, stress corrosion crack. This area of the steam generator will be thoroughly inspected at the next refueling outage and this tube has been plugged. We conclude that the imposed primary to secondary leak rate of 0.3 gpm under normal operating conditions provides adequate protection against tube burst from these types of cracks under the full range of normal and accident loadings.

Besides the "weeping" tube discussed above, seven other "weeping" locations were discovered and were found to be previously installed plugs. These plugs, five in generator 4B and two in generator 4C, have all been repair welded.

Gauging results indicate that any tube near the tubelane which restricted either the 0.610" or 0.540" probe lie within the 15% hoop strain contour. The number of tubes in the tubelane region that would not allow passage of the 0.540" probe were as follows: 21 in generator 4A, 4 in 4B and 10 in 4C. All these tubes have been plugged. Activity was also noted in wedge and patch plate areas consistent with previous experience at other units. All indicated cold leg tube restrictions were bounded by hot leg gauging results and fell within the strain contour maps for the cold leg side. The implementation of the plugging criteria discussed below, combined with previous plugging for various causes, resulted in a total of 16.9% of the tubes being plugged.

The gauging program performed is essentially the same as the programs followed at Turkey Point Unit No. 3 and Surry Unit No. 1 and 2. These programs have been developed over the course of time in consultation with the NRC staff and have been determined to be acceptable to the NRC. The inspection of the Unit No. 4 steam generators determined that the tube degradation which has occurred is similar to what has been experienced at Turkey Point Unit No. 3 and Surry Unit No. 1 and 2. Furthermore, the results of this inspection indicates that no unexpected degradation is occurring and no new phenomenon was uncovered.

Plugging Criteria

The plugging criteria implemented by the licensee is essentially the same as that used at other units with similarly degraded steam generator conditions. As in the previously accepted plugging criteria; e.g., as those discussed in the SER attached to the Order dated August 3, 1977, FPL has performed preventive plugging based on the projected growth of the critical tube hoop strain contours predicted by the finite element analysis. This same approach has been utilized to establish the extent of preventive plugging necessary for continued operation of Turkey Point Unit No. 3 and Surry Unit No. 1 and 2. The preventive plugging pattern bounds those tubes which may be anticipated to attain the level of strain which could lead to stress corrosion cracking during the next period of operation. The preventive plugging conducted by the licensee during the current outage justifies operation of the Turkey Point Unit No. 4 steam generators for at least six (6) effective full power months (EFPM).

Environmental Considerations

We have determined that the revised operating limitations do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the Order involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR 51.5(d)(4) that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this action.

Conclusion

Our Safety Evaluation Report attached to Amendment No. 27 to DPR-31 of Turkey Point Unit No. 3 dated August 16, 1977, evaluated the background information concerning "denting" of steam generator tubes which has been experienced at Surry Units No. 1 and 2 and Turkey Point Units No. 3 and 4. This background information is incorporated by reference. This safety evaluation discusses the additional information developed during the recent inspection of Turkey Point Unit No. 4 in February 1978 and reported in the licensee's submittal dated March 1, 1978.

We have concluded, based on the considerations discussed above, that: (1) Turkey Point Unit No. 4 may be operated for an additional six (6) EFPM under the restrictions delineated in the August 3, 1977, NRC Order. At the end of this period the facility shall be shutdown and the steam generators reprobated to ascertain the extent and pattern of tube denting and the results of this gauging program submitted to the NRC for review and evaluation prior to the resumption of power operation, (2) because the Order does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the Order does not involve a significant hazards consideration, (3) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (4) such activities will be conducted in compliance with the Commission's regulations and the issuance of this Order will not be inimical to the common defense and security or to the health and safety of the public.

Dated: March 8, 1978