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 FACIL:50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
 50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389

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 WOODY,C.O. Florida Power & Light Co.
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SUBJECT: Responds to NRC Bulletin 89-001, "Failure of Westinghouse Steam Generator Tube Mechanical Plugs."

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JUNE 19 1989

L-89-223
10 CFR 50.54(f)

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

Gentlemen:

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
NRC Bulletin No. 89-01:
Failure of Westinghouse Steam
Generator Tube Mechanical Plugs

NRC Bulletin No. 89-01, "Failure of Westinghouse Steam Generator Tube Mechanical Plugs," dated May 15, 1989, requested that licensees determine whether certain steam generator tube mechanical plugs supplied by Westinghouse were installed in their steam generators, and if so, that an action plan be implemented to ensure that these plugs will continue to provide adequate assurance of reactor coolant system pressure boundary integrity under normal operating, transient and postulated accident conditions. The purpose of this letter is to provide Florida Power & Light Company's response to the actions requested in the bulletin for St. Lucie Units 1 and 2.

Should there be any questions concerning the above information, please contact us.

Very truly yours,

C.O. Woody
C.O. Woody

Acting Senior Vice President - Nuclear

COW/MSD/vmg

Attachment

cc: Stewart D. Ebnetter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

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PDR ADOCK 05000335
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STATE OF FLORIDA)
) ss.
COUNTY OF PALM BEACH)

O. F. Pearson being first duly sworn, deposes and says:

That he is Vice President, of Florida Power and 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.

O. F. Pearson
O. F. Pearson

Subscribed and sworn to before me this
19 day of June, 1989.

Roberta S. Economy

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

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

Response to NRC Bulletin 89-01

The purpose of the bulletin is to determine whether certain mechanical plugs supplied by Westinghouse are installed in the steam generators and if so, that an action plan be implemented to ensure that these plugs will continue to provide adequate assurance of reactor coolant system pressure boundary integrity. The actions requested by the bulletin apply to Westinghouse mechanical plugs which have been fabricated from thermally treated Inconel 600, heat numbers 3279, 3513, 3962 and 4523.

ACTIONS REQUESTED ITEM 1

Request

Verify that information contained in Westinghouse report WCAP-12244, Revision 1, April 1989 and Westinghouse letter NS-NRC-89-3432 to NRC dated May 1, 1989 relating specifically to St. Lucie Plant is correct for plugs supplied from heat numbers 3279, 3513, 3962 and 4523. The information to be verified is the number of Westinghouse mechanical plugs installed in the hot and cold legs broken down by steam generator number, heat number, and date of installation. The request is to so state if plants have not installed Westinghouse mechanical plugs from the subject heats.

Response

Information contained in Westinghouse report WCAP-12244, "Steam Generator Tube Plug Integrity Summary Report" Revision 1, April 1989 and Westinghouse letter to NRC dated May 1, 1989 (NS-NRC-89-3432) "Steam Generator Tube Plug Integrity Update" has been reviewed for St. Lucie Unit 1 and is correct for plugs supplied from heat number 3513.

<u>Steam Generator</u>	<u>Number of 3513 Plugs</u>		<u>Installation Date</u>
	<u>Hot Leg</u>	<u>Cold Leg</u>	
1A	44	47	12/85
1B	19	19	12/85

St. Lucie Unit 1 has not installed Westinghouse mechanical plugs from heat numbers 3279, 3962, and 4523. Additionally, St. Lucie Unit 1 plugging did not include installation of stabilizers.

St. Lucie Unit 2 has not installed Westinghouse mechanical plugs from heat numbers 3279, 3513, 3962 and 4523. Additionally, St. Lucie Unit 2 has no Westinghouse mechanical plugs installed.

ACTIONS REQUESTED ITEM 2.a

Request

Steam Generator tube plug lifetime for plugs from heats 3279, 3513, 3962 and 4523 should be estimated using the methodology from WCAP-12244 Revision 1 and should be based on the Millstone Unit 2 benchmark.

Response

The steam generator tube plug lifetime for the St. Lucie Unit 1 heat number 3513 plugs was estimated using the methodology from WCAP-12244 Revision 1 and based on the Millstone Unit 2 benchmark. The estimated lifetime as of March 30, 1989 is -436 Effective Full Power Days (EFPD) for hot leg side plugs and +2257 EFPD for cold leg side plugs.

ACTIONS REQUESTED ITEMS 2.b

Request

Plants should implement appropriate remedial actions for all plugs whose estimated lifetimes do not extend to the next refueling outage. If operation is planned beyond the last refueling outage before any plug exhausts the predicted lifetime, an alternate schedule with the appropriate technical justification should be submitted.

Response

FPL plans to shutdown St. Lucie Unit 1 for a mid-cycle outage during the Summer of 1989 to remove the steam generator hot leg side tube plugs of heat number 3513 and replug with Combustion Engineering designed mechanical plugs of Inconel 690 material. Removal of plugs during the mid-cycle outage will be accomplished using the Combustion Engineering process of Electro-Discharge Machining (EDM). The cold leg side plugs of heat number 3513 will be removed during a future refueling outage.

The following are technical bases for continued operation of St. Lucie Unit 1 with hot leg side plugs that have exhausted predicted lifetime. These technical bases have been incorporated into an existing safety evaluation for plant operation with potentially leaking mechanical plugs.

- The occurrence of a plug top release will not rupture the parent steam generator tube, thus no loss of primary-to-secondary pressure boundary results.
- All potentially affected tubes were plugged without thru-wall indications and all indications except one were in the straight vertical section of the tubes. The effect of a plug top release on existing tube integrity has been evaluated and is not a concern. Therefore, failure of a tube plug will not result in a primary-to-secondary leak.

- Twenty seven (27) of the sixty three (63) hot leg side tube plugs are believed to have leaked by, and thus are not susceptible to plug top release mechanism.
- The potential for plug top releases is greater during several normal operating conditions and transients (such as downpower) than for accident conditions. Therefore, it is unlikely that an inventory of plug tops will be stored for release during accidents.

ACTIONS REQUESTED ITEM 2.c

Request

Plants are reminded that their responsibilities under ALARA require analysis of the various plug repair or replacement methods and should consider the accessibility of the plugs and the dose reduction of robotic manipulators.

Response

FPL analyzed various plug repair or replacement methods available to determine which method would result in the lowest overall personnel radiation exposure while still remaining cost effective for removal of plugs during a St. Lucie Unit 1 mid-cycle outage. Responsibilities under ALARA are a primary consideration and FPL plans to perform all of the plug replacements utilizing robotics.

ACTIONS REQUESTED ITEM 2.d

Request

Installation of Westinghouse mechanical plugs from heats 3279, 3513, 3962 and 4523 should be discontinued.

Response

FPL will not install Westinghouse mechanical plugs from heat number 3279, 3513, 3962 and 4523 in St. Lucie Units 1 and 2.

ACTIONS REQUESTED ITEM 2.e

Request

Westinghouse mechanical plugs removed from steam generators, regardless of heat number, should be examined for Primary Water Stress Corrosion Cracking (PWSCC) on a sample basis for each heat.

Response

The responsibilities under ALARA require that an initial successful attempt at removal of a cracked tube plug be a significant factor. Therefore, removal of the hot leg side plugs during the mid-cycle outage will be accomplished using the Combustion Engineering process of Electro-Discharge Machining (EDM). The

Combustion Engineering EDM process machines away the internal expander of the tube plug and the majority of tube plug wall. The remaining tube plug shell is not considered suitable for examination to determine the extent of inner diameter initiated PWSCC. In addition, the subject tube plugs are projected to have a negative margin to PWSCC. The industry data base is anchored through the Millstone 2 datum which is significantly more conservative than observations which would result from examination of the subject tube plugs removed from St. Lucie Unit 1. Thus, examination of the removed tube plug remnants, and associated radiological exposures, will not affect the industry data base and will not be performed.

ACTIONS REQUESTED ITEM 3

Request

Plants where the steam generator tubes are partially depth expanded within the tubesheet may defer remedial actions on a one time basis.

Response

This is not applicable to St. Lucie Plant.

ACTIONS REQUESTED ITEM 4

Request

Plants with "sentinel related" mechanical plugs may defer remedial actions on a one time basis.

Response

This is not applicable to St. Lucie Plant.