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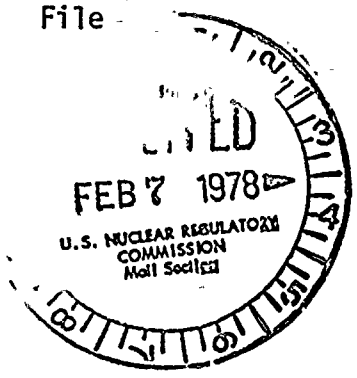

Mr. Jeffrey H. Broido
ANS Technical Program Chairman
Attn: Ruth Farmakes
American Nuclear Society
555 North Kensington Avenue
LaGrange Park, Illinois 60525

Dear Mr. Broido:

Enclosed are four copies of the Summary Cover Sheet and Summary for a paper describing Florida Power & Light Company's program for steam generator repair and the influence of water chemistry.

If the paper is accepted for presentation, please forward your invoice for page charges to me.

Very truly yours,

H. N. Paduano

H. N. Paduano
Power Resources-Section Supervisor

HNP:dt
Enclosure

cc: Mr. George Lear, Chief
Operating Reactors Branch No. 3, DOR
Division of Reactor Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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SUMMARY COVER SHEET

CONTRIBUTED PAPER ☐ INVITED PAPER [X]

ORIGINAL AND THREE COPIES REQUIRED

TITLE: TURKEY POINT STEAM GENERATOR REPAIR AND INFLUENCE OF WATER CHEMISTRY

AUTHOR(S): (List authors in the proper order and exactly as they are to be published. PLACE AN ASTERISK AFTER EACH AUTHOR WHO IS AN ANS MEMBER; AN "S" AFTER STUDENT AUTHOR.)

1. H. N. Paduano *
2. R. J. Acosta *
3. A. J. Gould *

AFFILIATION(S): (List corresponding author's affiliation and complete mailing address.)

1. Florida Power & Light Co., Power Resources Dept., P.O. Box 529100, Miami, Fl.33152
2. " " "
3. " " "

Indicate number of author to whom correspondence should be addressed 1, and complete page 4.

To whom should the page charge be billed? H. N. Paduano

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Original line drawings or glossy black-and-white prints of each figure must be attached to original.

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MR. H. N. PADUANO
FLORIDA POWER & LIGHT COMPANY
POWER RESOURCES DEPARTMENT
P. O. BOX 529100
MIAMI, FLORIDA 33152

Telephone: Commercial: (305)552-3798
FTS:

Title of Summary TURKEY POINT STEAM GENERATOR REPAIR AND INFLUENCE OF WATER CHEMISTRY

This is to acknowledge receipt of your summary. Please use the log number above in future correspondence.

This summary will be considered for inclusion in the program of the American Nuclear Society's 1978 Annual Meeting, San Diego, CA, June 18 - 23, 1978. Another copy of this form will be sent to you about March 4, 1978 informing you of the Program Committee action.

Your paper has been reviewed and:

- ☐ 1. Accepted for presentation at the 1978 Annual Meeting. (See Attached Instructions)
- ☐ 2. It is suggested that your summary be revised. (See Attachment)
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Thank you for submitting this summary.

Sincerely,

Jeffrey H. Broido
ANS Technical Program Chairman
1978 Annual Meeting

Turkey Point Steam Generator Repair

and

Influence of Water Chemistry

By
H. N. Paduano, R. J. Acosta, and A. J. Gould

Due to the progression of steam generator tube denting in the Turkey Point steam generators, FPL made the decision to begin a program aimed at repairing the steam generators. The program included evaluation of various repair alternatives, including retubing of the steam generators in place. The evaluation concluded that a replacement of the lower assembly (primary channel head plus tube bundle and secondary shell) was the best alternative. Such a repair was evaluated to offer the least construction process uncertainties, the shortest estimated outage time, and also enabled the repaired steam generator to incorporate all of the latest design improvements.

The repaired steam generators will have the following improvements:

a) thermally treated inconel tubes
b) stainless steel broached tube support plates
c) full depth expansion of tubes into the tube sheet
d) increased recirculation ratio
e) improved blowdown design
f) improved moisture separation equipment
g) capability for wet layup recirculation
h) improved access for secondary side inspections

Along with the steam generator repair program, FPL also has a program aimed at improved "water chemistry" for the steam generators and feedwater cycle. As a part of this program, FPL is investigating systems that will be designed to address problems associated with sludge, copper, chloride, oxygen, and other contaminants. Consideration is being given to shutdown and startup as well as normal operating modes. Areas under investigation include a feedwater recirculation cleanup system, magnetic filtration of the main feedwater, retubing of the main feedwater heaters with stainless steel, and deaeration of the condensate storage tank.

Also included in the program is the most important effort to obtain a leak free main condenser. In this regard, FPL believes that titanium tubing provides the greatest assurance for eliminating leakage and has already retubed three out of the eight waterboxes at Turkey Point Unit Nos. 3 and 4 with titanium. The experience thus far, after about two years of operation has been excellent.

While the exact schedule for repair of the steam generators is not finalized, it is possible that it could begin during the first quarter of 1979 on Turkey Point Unit 4. Following the repair, Florida Power & Light Company will implement a water

chemistry program which closely follows the latest recommendations of the NSSS vendor. Presently, it is anticipated that an All Volatile Treatment (AVT) program will be utilized with major emphasis on limiting operation outside the specified normal chemistry limits. The water chemistry program will be designed to provide increased protection of the repaired steam generator. The operating limits are expected to be very stringent, thus requiring procedural and equipment modifications, such as discussed above, to enable desired unit performance.

In summary, FPL has implemented a repair program that will result in improved steam generators. Along with the repair effort, a companion program whose aim is for increased protection of the steam generators through improved water chemistry has also been initiated. Through these programs, FPL intends to ensure continued, safe, and reliable operation of the Turkey Point nuclear units.