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FLORIDA POWER & LIGHT COMPANY

July 20, 1973

Mr. John F. O'Leary, Director
Directorate of Reactor Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

TURKEY POINT UNIT NO. 3
DOCKET NO. 50-250
ABNORMAL OCCURRENCE NO. 3-73-7
FUEL CLADDING DEFECTS

Dear Mr. O'Leary:

I. INTRODUCTION

This report is submitted in accordance with Technical Specification 6.6.2.a for Turkey Point Unit No. 3, Operating License No. DPR-31. This Abnormal Occurrence Report No. 3-73-7, describes an abnormal occurrence which was identified on July 13, 1973. The Directorate of Regulatory Operations, Region II, was notified on July 13, 1973.

II. DESCRIPTION OF OCCURRENCE

Routine reactor coolant sample analysis on July 11, 1973 indicated an increase in gross radioactivity by a factor of two. Increased surveillance was commenced and additional analyses were performed to determine if the increase in gross radioactivity was due to activation products or fuel cladding defects. Further investigation revealed a significant increase in activity of radionuclides of iodine, a significant increase in the activity ratio of Iodine-131 to Iodine-133, and significant increases in exposure rates measured in the area of the volume control tank gas space, the mixed bed demineralizer, and the reactor coolant system letdown line. Subsequent sampling and analysis confirmed that the halogens and the noble gases, which are fission products, continued to be detected in reactor coolant samples. Based on a review, analysis and evaluation of the results of these reactor coolant sample tests, it was concluded on July 13, 1973, that the significant increases in gross radioactivity and activity ratios of Iodine-131 to Iodine-133 was caused by fuel cladding defects.

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III. ANALYSIS OF THE OCCURRENCE

Upon detection of the higher than normal gross radioactivity in the reactor coolant, a gamma spectrum analysis of the sample was performed. The results of this analysis showed an increase in the activity of all radionuclides of iodine, specifically Iodine-131 increased by a factor of 100. The activity ratio of Iodine-131 to Iodine-133 showed an increase from about 0.15 to about 0.90. A significant increase in this ratio is considered to be a positive indication of fuel cladding defects. Analysis of dissolved gases in the reactor coolant showed an increase in activity by a factor of 10, specifically Xenon-133 and Xenon-135 which are fission products. Additional radiological surveillance showed increases in exposure rates by a factor of two to five from various system components caused by this increase in radioactivity in the reactor coolant.

IV. CORRECTIVE ACTION TO PREVENT RECURRENCE

The immediate corrective action was directed toward removal of radioactivity, associated with fuel cladding defects, by utilizing the equipment and systems designed and installed to maintain control over radioactive material within the reactor coolant system.

Permanent corrective action will involve identification, removal and replacement of fuel assemblies which contain fuel rods with fuel cladding defects.

V. ANALYSIS AND EVALUATION OF SAFETY IMPLICATIONS OF THE OCCURRENCE

Unit Nos. 3 and 4 are designed and provided with equipment and systems to maintain control over radioactive material, which may be present in the reactor coolant system as a result of fuel cladding defects, during reactor operation. Unit Nos. 3 and 4 Final Safety Analysis Report shows that reactor operation can continue with 1% fuel defects without adversely affecting the safe operation of the reactor.

Shielding within the containment building, control building and auxiliary building is designed to provide for the protection of plant personnel when operating with 1% fuel defects. Radiation Work Permits provide for control of access into plant areas with increased radiation exposure rates.

Operating procedures and installed equipment provide for maintaining control over radioactive materials in gaseous and liquid effluents produced during reactor operation. Liquids are processed to remove radioactive material from liquid.

Gases are processed and stored in waste gas tanks to provide for radioactive decay of radionuclides with relatively short half life.

Evaluation of the results of No. 3 reactor coolant samples and increased exposure rates from equipment or components handling reactor coolant indicates that No. 3 reactor core has experienced fuel cladding defects. Comparison of calculated values for 1% fuel defects presented in the FSAR with the reactor coolant sample analysis show that the relatively small quantities of radioactive material present in No. 3 reactor coolant represent a small fraction of 1% fuel defects.

VI. CONCLUSION

a. Results of No. 3 Reactor Coolant Sample Analysis indicate that No. 3 reactor has experienced fuel cladding defects. Comparison of the relatively small quantities of radioactive material in No. 3 reactor coolant with the calculated values for 1% fuel defects, presented in the FSAR, show that this represents a very small fraction of the 1% fuel defects.

b. Operation of No. 3 Unit may continue because Unit Nos. 3 and 4 are designed for continuous operation with 1% fuel defects by providing equipment and systems to maintain control over radioactive material which may be present.

c. This abnormal occurrence did not present any danger to the public health or safety.

Very truly yours,

A. D. Schmidt
Director of Power Resources

ADS/JKH/DH/VTC:paz

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