

CONTROL BLOCK: | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

CON'T

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

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| 0 | 3 |
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CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

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| 1 | 4 |
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Block 27. Cause Description and Corrective Actions (Cont.)

Evaluation For Operability:

A Gamma Metrics consultant inspected the wide range excore nuclear instrument system with the results that some of the fission chambers in the detector assemblies had failed. There are four detectors in the system with each detector containing four fission chambers. The following failures were noted:

Channel A - 1 failed fission chamber
Channel B - 2 failed fission chambers
Channel C - 1 failed fission chamber
Channel D - 2 failed fission chambers (out of service during the evaluation)

The sensitivity of the detector assembly is reduced proportional to the number of inoperative fission chambers. The sensitivity of the three (3) operating detectors as configured (with failed chambers) ranged from a low of 5.43 CPS/NV to a high of 8.00 CPS/NV (a higher count rate indicates a better sensitivity).

The system was evaluated to determine operability with respect to Tech. Spec. 3.9.2 with the following findings:

1. The vendor's (Gamma Metrics) recommendation is that a channel should be considered operable if its sensitivity is at least 1 CPS/NV. As previously discussed, the sensitivity of the equipment ranged from 5.43 to 8.00 CPS/NV, thus, the detector sensitivity was well within the vendors recommendation.
2. The readings available from the detector assemblies were comparable to the readings taken during the previous outage, thus the sensitivity was judged to be adequate.
3. The original specification for the subject equipment required a sensitivity of 8.0 CPS/NV. The system had two channels (A & C) at or near 8.0 CPS/NV.
4. Regulatory Guide 1.68, Rev. 2 requires that a neutron count rate of at least $\frac{1}{2}$ CPS above background levels should register on the source range with a signal to noise ratio of at least 2/1. The instrumentation registered count rates between 1.26 CPS and 9.85 CPS. Thus, with a background rate of $\frac{1}{2}$ CPS the instrumentation was within R.G. 1.68 limitations. FP&L Reactor Engineering indicated the background count rate was less than $\frac{1}{2}$ CPS. Also, the signal to noise ratios ranged between 3/1 and 9/1 and were therefore within tolerance.

Block 27. Cause Description and Corrective Actions (Cont.)

Evaluation For Operability (Cont.)

5. Tech. Spec. requirement is for a minimum of two out of four channels to be operable during operational mode 3, 4, 5, and 6 and 3 out of 4 during operational modes 1 and 2. Three channels were operating during the period of interest.

The following conclusions were drawn:

1. It was determined that the system was adequate to meet the Tech. Spec. Section 3.9.2 requirement for neutron flux monitoring systems during operational mode 6 (refueling operations). Fuel movement operations were authorized and conducted.
2. It was determined that the system has always met the operability requirements of Tech. Spec. 3.9.2 for modes 1, 2, 3, 4, and 5.

It should be noted that the wide range excore nuclear instrument system is not used as an input to any reactor protection system trip used in the safety evaluation (no credit is taken for the high start-up rate trip).

Corrective Actions

All four detectors were replaced during the 1984 refueling outage. The vendor (Gamma Metrics) analyzed one of the failed detectors. The failure was isolated to the insulator in the fission chamber connector. A failed part analysis determined that material was being deposited across the ceramic insulator. The exact mechanism causing the deposit could not be identified.

Since the detectors were replaced no further problems have been encountered with the operation of the wide range excore nuclear instrument system.

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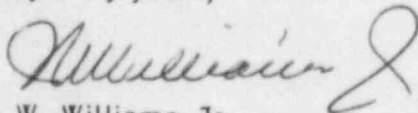
U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

Re: Reportable Event 83-24
St. Lucie Unit #1
Date of Event: March 14, 1983
Nuclear Instrumentation

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR to provide notification of the subject event.

Very truly yours,



J. W. Williams, Jr.
Group Vice President
Nuclear Energy

JWW/PLP/tla

Attachment

cc: Dr. J. Nelson Grace, Region II, USNRC
Harold F. Reis, Esquire
File 933.1
PNS-LI-85-263

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