



SUPPLEMENT TO CAUSE DESCRIPTION

In the process of preparing the input data for the "DETECTOR" computer code which is used for processing the flux maps, an error was discovered when a line-by-line comparison was made between Unit 1 Cycle 7 and Unit 1 Cycle 8 input data sets on card no. Z14E. The nature of the error is as follows:

According to the Unit 1 Technical Specifications Surveillance Requirements 4.2.2.2c, Amendment No. 61

$$(1) F_Q^M(Z) \leq \left[ \frac{F_Q^L(Z)}{P \times E_p(Z)} \right] \frac{K(Z)}{V(Z)} \quad P > 0.5$$

Here:

$$(2) E_p(Z) = \begin{cases} 1.0 & 0 \leq E_{\ell} \leq 17.62 \text{ GWD/MTU} \\ 1.0 + [.0040 \times F_Q^M(Z)] & 17.62 \text{ GWD/MTU} \leq E_{\ell} \leq 34.5 \text{ GWD/MTU} \\ 1.0 + [.0093 \times F_Q^M(Z)] & 34.5 \text{ GWD/MTU} \leq E_{\ell} \leq 42.2 \text{ GWD/MTU} \end{cases}$$

The card Z14E should have the numbers:

0.0, 0.0040, and 0.0093

which specify the multipliers of  $F_Q^M(Z)$  in equation (2). Instead of these numbers, the Z14E card for Unit 1 Cycle 7 contained the numbers:

0.0, 0.0039, and 0.0085.

The parameters represented Unit 1 Cycle 6 Technical Specifications. They should have been changed as per Amendment No. 61 issued on September 15, 1982. It should be noted that the Startup of Unit 1 Cycle 7 was also on September 15, 1982.

Impact of the Error on Unit 1 Cycle 7 Flux Maps

The right side of equation (1) which represents the Technical Specification limit may be rewritten in the form:

$$(3) TL = \frac{a}{E_p(Z)}$$

Where:

$$(4) a = \frac{F_Q^L(Z)}{P} \frac{K(Z)}{V(Z)}$$

Assuming for conservatism that the lowest margin in respect to the Technical Specification limit was in the most burned fuel assembly, we can define the ratio of the limit with the wrong data to the limit with the correct data as

$$\begin{aligned}
 (5) \quad R &= \frac{a}{1.0 + .0085 \times F_Q^M(Z)} \times \frac{1.0 + 0.0093 F_Q^M(Z)}{a} \\
 &= \frac{1.0 + .0093 F_Q^M(Z)}{1.0 + .0085 F_Q^M(Z)}
 \end{aligned}$$

Assuming  $F_Q^M(Z) = 2.04$ , which is the maximum possible number, we get:

$$R = 1.0016$$

The most limiting flux map with respect to  $F_Q^M(Z)$  in the Cycle 7 (Option 6) was map #12 at 336 MWD/MTU. For this map Technical Specification limit was 1.7966 and the measured number was 1.7132. It shows that we had a margin of

$$\frac{1.7966 - 1.7132}{1.7132} = .0487 = 4.87\%$$

The assembly with this margin was located in location 4-K and was a fresh fuel assembly. But even if it were a burned assembly and we should divide the number 1.7966 by R, we would get 4.70%.

It is evident, therefore, that no Technical Specification violations occurred because of this error. Two (2) flux maps were rerun with the correct Z14E cards. No changes were indicated when comparing the results of these runs to the results of the old runs. The maps which were rerun were the most limiting map #12 and the EOC 7 map.

#### Conclusion

No Technical Specification violations could have occurred because of the error in the "Detector" code data set for Unit 1 Cycle 7.

Preventative Actions

AEPSC has revised the Nuclear Materials and Fuel Managment Section Procedure No. 6 to explicitly require independent verification of all Technical Specification changes. This procedure previously required explicit checking only when changes were caused by Theoretical Factors and Burnup. In addition, AEPSC will provide the plant with the documentation package which contains the Calculation Cover Sheet and an explanation of the changes.

This revision is being submitted to change the cause code to personnel error and update the preventive action statement for the corrective measures completed.

DMD



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Mr. J.G. Keppler, Regional Administrator  
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Region III  
799 Roosevelt Road  
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Operating License DPR-58  
Docket No. 50-315

Dear Mr. Keppler:

Pursuant to the requirements of the Appendix A Technical Specifications, the following report/s are submitted:

RO 83-098/01X-1.

Sincerely,

W.G. Smith, Jr.  
Plant Manager

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Attachment

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