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GENERAL ELECTRIC

NUCLEAR POWER

SYSTEMS DIVISION

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REE-078-80

November 14, 1980

U. S. Nuclear Regulatory Commission
Division of Operating Reactors
Office of Nuclear Reactor Regulations
Washington, D.C. 20555

Attention: Thomas A. Ippolito, Chief
Operating Reactors Branch #3

Reference: Letter, Ronald Engel (GE) to Darrel G. Eisenhut (NRC), November 30, 1977

Gentlemen:

SUBJECT: CHANGE IN GENERAL ELECTRIC METHODS FOR ANALYSIS OF MISLOCATED BUNDLE ACCIDENT

The purpose of this letter is to advise you of a planned change in General Electric reload license analyses. Beginning with reload analyses initiated after January 1, 1981, General Electric intends to discontinue performing plant-cycle specific mislocated bundle analyses. The basis for this change is presented in Attachment B to this letter wherein it is shown that based on analysis of sixteen operating cycles (5512 analyzed mislocations), there is greater than a 95% probability with 95% confidence that the worst case mislocated bundle will not result in violation of the safety limit critical power ratio.

Since implementation by General Electric of the "statistical Haling method" (Reference) to analyze the mislocated bundle for reloads, there have been no cases in which this error resulted in a MCPR less than the safety limit CPR. It is estimated that elimination of this unnecessary analysis will result in significant resource savings for both General Electric and the NRC.

The information contained in the attachment to this letter is of the type which General Electric Company customarily maintains in confidence and withholds from public disclosure. It has been handled and classified as proprietary by General Electric as is indicated in the affidavit of Glenn G. Sherwood (Attachment A), and we hereby request that it be withheld from public disclosure in accordance with the provisions of 10CFR2.790.

Dupe of 8011190206

If you have questions regarding this planned change, please phone John Leaser of my staff at (408) 925-5458.

Very truly yours,

Ronald E Engel

Ronald E. Engel, Manager
Reload Fuel Licensing
Safety and Licensing Operation

REE:csc:ggo/3F

Attachment

cc: L. S. Gifford

GENERAL ELECTRIC COMPANY PROPRIETARY

ATTACHMENT B

Basis for Elimination of Fuel Loading Error Analysis for Mislocated Bundle

Background:

Prior to 1976, the mislocated fuel bundle loading error was treated as an accident and did not impact plant operating limits. Since 1978 the NRC has required that this event not result in a violation of the safety limit MCPR. With the extreme conservatism of the analysis procedure for the mislocated bundle error at that time, the reclassification resulted in the mislocated bundle loading error establishing the MCPR operating limits and impacting plant operation.

As a result of the impact of the mislocated bundle loading error on plant operation, a new analysis method (the "adjusted Haling" method) was developed which eliminates much of the conservatism inherent in the earlier method. This new procedure was reviewed and approved by the NRC in 1978 (References 1 & 2).

Results from New Analysis Method

Since implementation of the new "adjusted Haling" method in 1978, the mislocated bundle loading error analysis has been performed for 16 operating cycles. A summary of the loading errors analyzed for these 16 cycles is shown in Table 1. The selection process used in the analysis procedure ensures that the worst case error for each cycle is analyzed (Reference 3). The worst loading errors obtained in the 16 cycles are given in Table 2. This distribution of worst case errors demonstrates that the probability of the worst case error resulting in an MCPR of the mislocated bundle $\geq$1.08 is 95% with a 95% confidence level (one sided). This $\geq$1.08 value is above the safety limit and far above the value of 1.0, which General Electric believes is appropriate for this event.

TABLE 1

SUMMARY OF LOADING ERRORS ANALYZED

Case	No. of Bundles			Loading Errors Considered
	Total	Peripheral	Fresh Reload	
1	764	92	252	420
2	764	92	272	400
3	764	92	292	380
4	548	76	100	372
5	548	76	112	360
6	560	76	164	320
7	560	76	176	308
8	560	76	156	328
9	560	76	132	352
10	560	76	132	352
11	764	92	208	464
12	368	60	88	220
13	368	60	88	220
14	724	84	160	480
15	560	76	160	324
16	368	60	96	212

16 Operating Cycles Analyzed

5512 Loading Errors Considered

TABLE 2

WORST LOADING ERRORS OBTAINED

Case	Mislocated Bundle MCPR
1	1.321
2	1.348
3	1.315
4	1.170
5	1.186
6	1.251
7	1.240
8	1.281
9	1.236
10	1.230
11	1.260
12	1.182
13	1.247
14	1.450
15	1.201
16	1.276
Mean Values	1.262
Mean - 1σ	1.191
Mean - 2σ	1.120

Conclusions

On the basis of the above data, it is concluded that the probability that a mislocated fuel bundle loading error will result in a CPR less than the safety limit is sufficiently small that plant and reload specific analyses are not necessary. Therefore, beginning with reloads after January 1, 1981 General Electric plans to discontinue performing the mislocated fuel bundle loading error analysis as part of the reload licensing process.

References

(1) Letter, D. G. Eisenhut (NRC) to R. L. Gridley (GE), enclosing "Safety Evaluation for the General Electric Topical Report, Generic Reload Fuel Application (NEDE-24011-P), May 12, 1978.

(2) Letter, Darrel G. Eisenhut (NRC) to Ronald Engel (GE), May 8, 1978

(3) Letter, Ronald Engel (GE) to Darrel G. Eisenhut (NRC), November 30, 1977.