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July 8, 1983

Mr. A. Schwencer, Chief  
Licensing Branch No. 2  
Division of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Subject: Limerick Generating Station, Units 1 & 2  
Response to Core Performance Branch  
Draft Safety Evaluation Report

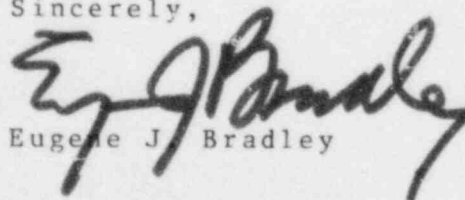
Reference: 1) A. Schwencer to E. G. Bauer, Jr.  
letter dated March 11, 1983  
2) E. J. Bradley to A. Schwencer,  
letter dated May 25, 1983

File: GOVT 1-1 (NRC)

Dear Mr. Schwencer:

The attached documents are revised draft responses to Core Performance Branch Draft Safety Evaluation Report items 2, 3, 8 and 9. The information contained on these draft responses will be incorporated into the FSAR, exactly as it appears on the attachments, in revision scheduled for August, 1983.

Sincerely,

  
Eugene J. Bradley

RJS/cw/P-99

cc: See Attached Service List

SD -

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Boo!  
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## DRAFT SAFETY EVALUATION REPORT ITEMS

### CORE PERFORMANCE BRANCH

# DRAFT

#### Question (2) - Fuel Rod Mechanical Fracturing

The term "mechanical fracture" refers to a cladding defect that is caused by an externally applied force such as a hydraulic load or a load derived from core plate motion. These loads are bounded by the loads of a LOCA and SSE, and the mechanical fracturing analysis is usually done as a part of the seismic-and-LOCA loads analysis (see Section 4.2.3.3(4) of this report). Because that analysis has not been completed for Limerick, it is not clear what design limit will be used for the mechanical fracturing analysis. This is an open item.

#### Response

Preliminary evaluations have been performed for the Limerick fuel assemblies in accordance with the methodology presented in NEDE-21175-3-P. These preliminary results indicate that:

- (1) the most limiting accelerations experienced by the assembly will be no greater than 2.0g horizontal and 4.0g vertical, and
- (2) the fuel lift gap between the lower tie plate and fuel support casting is no greater than 0.2 inch.

Even though the final Limerick results will not be available until August 12, 1983, the preliminary results are consistent with the BWR 4/5 fuel design, and hence can be used to predict the adequacy of the Limerick design. As shown in Table 1, substantial margin exists in the Limerick design to assure that:

- (1) the stress due to dynamic loading is well within the code allowables per the NUREG-0800 guidelines,
- (2) a coolable geometry is maintained in the core, and
- (3) the fuel assembly response will not interfere with the movement of the control rods.

DRAFT SAFETY EVALUATION REPORT ITEMS

CORE PERFORMANCE BRANCH

**DRAFT**

TABLE I  
Limerick Fuel Assembly Load Comparison

	<u>Limerick</u>	<u>Allowable</u>
Vessel Size	BWR 4/251	-
Channel Thickness (mil.)	100	-
Horizontal Acceleration (g)	$\leq 2.0$	3.6 <sup>(1)</sup>
Vertical Acceleration (g)	$\leq 4.0$	12.0 <sup>(1)</sup>
Fuel Lift Gap (in)	$\leq 0.2$	0.52

(1) Allowable for 100 mil channel

DRAFT SAFETY EVALUATION REPORT ITEMS

CORE PERFORMANCE BRANCH

**DRAFT**

Question (3) - Fuel Assembly Structural Damage From External Forces

Earthquakes and postulated pipe breaks in the reactor coolant system would result in external forces on the fuel assembly. NUREG-0800, Section 4.2, and Appendix A to that section state that fuel system coolability should be maintained and that damage should not be so severe as to prevent control rod insertion when it is required during these low probability accidents. Because GE has not completed this analysis for Limerick, it is not clear what the exact design limits will be, but they must follow the guidelines of NUREG-0800 Section 4.2, Appendix A. This is an open item.

Response

This question is addressed in the response to Question (2).

DRAFT SAFETY EVALUATION REPORT ITEMS

CORE PERFORMANCE BRANCH

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Question (8) - Fuel Rod Mechanical Fracturing

The mechanical fracturing analysis is usually done as part of the seismic-and-LOCA loads (see Section 4.2.3.3(4) of this report). Because that analysis has not been completed for Limerick, the information on mechanical fracturing is not available. This is an open issue.

Response

This question is addressed in the response to Question (2).

DRAFT SAFETY EVALUATION REPORT ITEMS

CORE PERFORMANCE BRANCH

**DRAFT**

Question (9) - Fuel Assembly Structural Damage from External Forces

An analysis must be provided by the applicant that shows that the Limerick fuel meets the structural requirements (including liftoff) of Appendix A to Section 4.2 of NUREG-0800. Because the review of a generic report (NEDE-21175-3-P) is not completed. (Question incomplete).

Response

This question is addressed in the response to Question (2).