

**GE Nuclear Energy**

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*General Electric Company  
3901 Castle Hayne Road, Wilmington, NC 28401*

August 24, 2004  
MFN 04-081

Document Control Desk  
United States Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike  
Rockville, Maryland 20852-2738

**Subject: Part 21 Reportable Condition and 60-Day Interim Report  
Notification: Non-conservative SLMCPR**

Global Nuclear Fuel (GNF) and GE Nuclear Energy (GENE) have determined that the current GNF process for determination of the Safety Limit Minimum Critical Power Ratio (SLMCPR) can result in a non-conservative SLMCPR. GENE has historically used a non-conservative SLMCPR impact of 0.01 as the threshold for reportability under 10CFR21. A preliminary screening evaluation has been completed for all plants operating with a SLMCPR calculated by GNF to determine those that have a non-conservative impact of 0.01 or greater. Verification has been completed for those plants that the screen showed to have a non-conservative SLMCPR impact of 0.01 or greater. Verification has not been completed for the plants that the screen showed had an impact of less than 0.01 or were unaffected, thus requiring a 60-Day Interim Report notification pending verification completion.

The identified non-conservative SLMCPR only slightly exceeded the threshold for a Reportable Condition and would not lead to a substantial safety hazard due to the large margin to fuel failure associated with the SLMCPR and the multiple automatic and passive protection features of a BWR.

The plants for which GNF calculates the SLMCPR are identified in Attachment 1. Those plants for which the preliminary screen indicated that the current SLMCPR is unaffected are identified as a 60-Day Interim Report. Upon completion of verification (assuming the results of the screen are confirmed) the status of these plants will be changed to Not Reportable. GENE will provide a follow-up report to the NRC by September 29, 2004. The plants for which the current SLMCPR is non-conservative by 0.01 or greater are identified as a Reportable Condition under 10CFR21.21(d). These plants will take action to address the Reportable Condition as described in Attachment 2.

#### **Discussion**

During performance of SLMCPR calculations for an extended operating domain condition, GNF discovered an apparent flow impact where a lower flow condition at

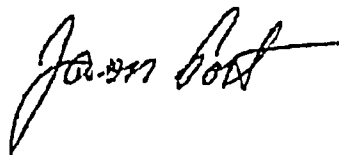
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rated power had a more limiting SLMCPR than the rated flow condition. Current procedures specify that the SLMCPR be calculated on the upper boundary of the power/flow operating map only at 100% power/100% flow (rated P/rated F). The SLMCPR is calculated at 3 operating points in the cycle: Beginning of Cycle (BOC), Peak Hot Excess (PHE), and End of Cycle (EOC) at rated P/rated F conditions. The SLMCPR calculation is dependent upon many fuel and cycle parameters and the most limiting SLMCPR may occur at any of the analyzed points. The SLMCPR is the most limiting bundle MCPR from these calculations that corresponds to 0.1% of fuel rods in the core being susceptible to boiling transition due to the postulated occurrence of the limiting AOO event.

In the instances where this concern was discovered, the control rod patterns used at the off-rated flow/rated power condition created a more limiting bundle-by-bundle MCPR distribution than the control rod patterns used at rated power/rated flow, even though both control rod patterns met the criterion defined in the SLMCPR calculation process, and it produced a more limiting SLMCPR.

If you have any questions, please call me at (910) 675-6608.

Sincerely,



Jason S. Post, Manager  
Engineering Quality & Safety Evaluations

- cc: S. D. Alexander (NRC-NRR/DIPM/IPSB) Mail Stop 6 F2
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- J. F. Klapproth (GENE)
- H. J. Neems (GENE)
- L. M. Quintana (GENE)
- PRC File

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**Attachment 1 – Affected and 60-Day Interim Notification Plants**

<u>60-Day Interim</u>	<u>Reportable Condition</u>	<u>Utility</u>	<u>Plant</u>
X		AmerGen Energy Co.	Clinton
X		AmerGen Energy Co.	Oyster Creek
X		Carolina Power & Light Co.	Brunswick 1
X		Carolina Power & Light Co.	Brunswick 2
	X	Constellation Nuclear	Nine Mile Point 1
X		Constellation Nuclear.	Nine Mile Point 2
	X	Detroit Edison Co.	Fermi 2
		Dominion Generation	Millstone 1 <sup>(1)</sup>
		Energy Northwest	Columbia
X <sup>(2)</sup>	X <sup>(2)</sup>	Entergy Nuclear Northeast	FitzPatrick
X		Entergy Nuclear Northeast	Pilgrim
		Entergy Operations, Inc.	Grand Gulf
		Entergy Operations, Inc.	River Bend
X		Entergy Nuclear Northeast	Vermont Yankee
		Exelon Generation Co.	CRIT Facility
X		Exelon Generation Co.	Dresden 2
X		Exelon Generation Co.	Dresden 3
X		Exelon Generation Co.	LaSalle 1
X		Exelon Generation Co.	LaSalle 2
X		Exelon Generation Co.	Limerick 1
X		Exelon Generation Co.	Limerick 2
X		Exelon Generation Co.	Peach Bottom 2
X		Exelon Generation Co.	Peach Bottom 3
X		Exelon Generation Co.	Quad Cities 1
X		Exelon Generation Co.	Quad Cities 2
X		FirstEnergy Nuclear Operating Co.	Perry 1
	X	Nebraska Public Power District	Cooper
X		Nuclear Management Co.	Duane Arnold
X		Nuclear Management Co.	Monticello
		Pooled Equipment Inventory Co.	PIM
		PPL Susquehanna LLC.	Susquehanna 1
		PPL Susquehanna LLC	Susquehanna 2
X		PSEG Nuclear	Hope Creek
X		Southern Nuclear Operating Co.	Hatch 1
X		Southern Nuclear Operating Co.	Hatch 2
		Tennessee Valley Authority	Browns Ferry 1 <sup>(1)</sup>
X		Tennessee Valley Authority	Browns Ferry 2
		Tennessee Valley Authority	Browns Ferry 3

Notes:

1. Plant is in an extended shutdown
2. 50-Day Interim report for current operation, Reportable Condition for SLMCPR licensing submittal

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**Attachment 2 – Required Information per §21.21(d)(4)**

- (i) Name and address of the individual providing the information:  
J. S. Post, Manager, Engineering Quality & Safety Evaluations, GE Nuclear Energy,  
3901 Castle Hayne Road, Wilmington, NC 28401
- (ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity that contains a deviation or failure to comply:  
GENE has determined that it is a Reportable Condition for Cooper, Fermi 2, Fitzpatrick, and NMP-1 as shown in Attachment 1.
- (iii) Identification of the firm constructing the facility or supplying the basic component that contains a deviation or failure to comply:  
Some fuel reload analyses performed by Global Nuclear Fuel (GNF) could result in a non-conservative SLMCPR.
- (iv) Nature of the defect or safety hazard that could be created by such a deviation or failure to comply:  
For some plants, rod patterns used in plant-specific SLMCPR analysis at rated conditions are not as limiting relative to rod patterns developed at rated power/lower flow conditions. If a more limiting rod pattern were to be used, and if the plant were operating on its MCPR operating limit, and if a limiting transient were to occur, it could lead to violation of the SLMCPR. This does not indicate that there is a substantial safety hazard. There is still margin to boiling transition if the SLMCPR is violated, and there is still large margin to fuel rod failures if the boiling regime changes from nucleate to film boiling.
- (v) The date on which the information of such a deviation or failure to comply was obtained:  
This concern was identified in the GENE safety evaluation program on June 25, 2004.
- (vi) In the case of a basic component that contains a deviation or failure to comply, the locations of all such components in use or being supplied:  
The non-conservative SLMCPR analysis exists for Cooper, Fermi, and NMP-1 in current plant operation. It also exists in the SLMCPR licensing submittal for Fitzpatrick.
- (vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action (note, these are actions specifically associated with the identified deviation or failure to comply):  
GNF has notified all plants that have been confirmed to be affected. The plants that have a non-conservative SLMCPR for current plant operation will take action to mitigate the potential impact. Depending on the specific circumstances, mitigating actions to protect the SLMCPR may include increasing the OLMCPR to assure compliance with the low flow calculated SLMCPR. In some cases sufficient conservatism may exist in the OLMCPR at low flow to bound the increased SLMCPR. Each affected plant will notify the NRC and take appropriate action if their Technical Specifications are affected. One plant currently has a non-conservative SLMCPR

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Technical Specification change request submitted to the NRC. They will notify the NRC and determine how to correct the submitted values.

There are no actions necessary for the plants that are unaffected pending completion of verification. If, in the course of verification, GNF determines that there is an impact, the affected utility will be notified immediately. GNF will complete the verification and GENE will provide a follow-up letter to the NRC by September 29, 2004.

GNF has opened Corrective Action Request (CAR) AI-9416 to address the impact on the SLMCPR methodology.

(viii) Any advice related to the deviation or failure to comply about the facility, activity, or basic component that has been, is being given to purchasers or licensees:

Affected licensees should notify the NRC if a revised SLMCPR submittal is required and work with their GNF customer account leader to obtain the revised analysis.