



September 29, 2004  
MFN 04-108

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Rockville, Maryland 20852-2738

Attention: Chief, Information Management Branch  
Program Management  
Policy Development and Analysis Staff

**Subject: Part 21 Final Report: Non-conservative SLMCPR**

Reference: GENE letter, "Part 21 Reportable Condition and 60-Day Interim Report Notification: Non-conservative SLMCPR," MFN 04-081, August 24, 2004

Global Nuclear Fuel (GNF) and GE Nuclear Energy (GENE) previously notified the NRC in the reference letter that the current GNF process for determination of the Safety Limit Minimum Critical Power Ratio (SLMCPR) can result in a non-conservative SLMCPR. A preliminary screening calculation had been completed to identify the plants that were potentially affected. The evaluation was completed for the plants that had been determined to be potentially affected and these plants were identified as a reportable condition under 10CFR21.21(d) in MFN 04-081. The evaluation was not completed for the plants that had been determined to be potentially unaffected and these plants were identified as a 60-Day Interim Report notification under 10CFR21.21(a)(2) in MFN 04-081.

The evaluation for the potentially unaffected plants has now been completed. The results of the screening calculation have been confirmed: this is not a reportable condition for the plants that were previously identified as a 60-Day Interim Report notification in MFN 04-081.

GENE has historically used a non-conservative SLMCPR impact of 0.01 as the threshold for reportability under 10CFR21. The identified non-conservative SLMCPR change 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 current SLMCPR is conservative are identified as Not Reportable.

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The plants for which the current SLMCPR is non-conservative by 0.01 or greater were previously identified as a Reportable Condition under 10CFR21.21(d) in MFN 04-081.

#### Discussion

During performance of SLMCPR calculations for an extended operating domain condition, GNF discovered an apparent flow impact where a lower flow condition at 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: (1) Beginning of Cycle (BOC), (2) Peak Hot Excess (PHE), and (3) 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 Abnormal Operating Occurrence (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.

GENE/GNF previously notified the affected plants as identified in MFN 04-081, August 24, 2004. There are no actions necessary for the plants that are confirmed to be unaffected as identified in Attachment 1.

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

Sincerely,



Jason. S. Post, Manager  
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PRC File

**Attachment 1 – Plants Previously Identified in MFN04-081**

<u>Not Reportable</u>	<u>Reportable Condition (per MFN04-081)</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. Not reportable for current operation, Reportable Condition for SLMCPR licensing submittal