Entergy

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GNRO-2014/00069

October 02, 2014

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Revised Response to Items 1 and 2 of the Request for Additional Information Regarding "Maximum Extended Load Line Limit Plus" Amendment Request, dated 5/19/2014.
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

REFERENCES:

1. Electronic Request for Additional Information Regarding "Maximum Extended Load Line Limit Plus" Amendment Request Dated 5/19/2014 (TAC MF2798)
2. Entergy Letter, "Response to Request for Additional Information Regarding Maximum Extended Load Line Limit Plus Amendment Request, dated 5/19/2014" GNRO-2014/00045, dated August 26, 2014. (ADAMS Accession No. ML 14239A186).
3. Entergy Letter, "Maximum Extended Load Line Limit Analysis Plus (MELLLA+) License Amendment Request," GNRO-2013/00012, dated September 25, 2013 (ADAMS Accession No. ML13269A140).

Dear Sir or Madam:

Entergy Operations, Inc. is providing in the Attachment a revised response to Items 1 and 2 of the Reference 1 Request for Additional Information (RAI). Initial responses to Items 1 and 2 were provided in Reference 2, and are being revised in this letter. The revision will replace Figures 1.1 and 2.1 with an updated version. The revision removes the text above the 50 MWt/Mlbm/hr line on the Thermal Power vs. Core Flow map as agreed during a call with the Nuclear Regulatory Commission (NRC) on September 12, 2014.

This letter contains no new commitments. If you have any questions or require additional information, please contact Mr. James Nadeau at 601-437-2103.

I declare under penalty of perjury that the foregoing is true and correct; executed on October 02, 2014.

Sincerely,

Thomas Coutu for Kevin T. Mulligan

TC/tmc

Attachment: Revised Response to Item 1 and Item 2 Request for Additional Information dated 5/19/2014 pertaining to License Amendment Request – Maximum Extended Load Line Limit Plus (Non-Proprietary)

cc: with Attachment

U.S. Nuclear Regulatory Commission
ATTN: Mr. Marc L. Dapas
Regional Administrator, Region IV
1600 East Lamar Boulevard
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U.S. Nuclear Regulatory Commission
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NRC Senior Resident Inspector
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Port Gibson, MS 39150

State Health Officer
Mississippi Department of Health
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Jackson, MS 39215-1700

Attachment to

GNRO-2014/00069

REVISED RESPONSE TO ITEM 1 AND ITEM 2 REQUEST FOR ADDITIONAL INFORMATION DATED 5/19/2014 PERTAINING TO LICENSE AMENDMENT REQUEST – MAXIMUM EXTENDED LOAD LINE LIMIT PLUS

(NON-PROPRIETARY)

1.0 POWER DENSITY > 50 MEGAWATT THERMAL/MLBM/HR

Section 2.2.1 "Safety Limit Minimum Critical Power Ratio" states that "The currently approved off-Rated Core flow (CF) uncertainty applied to the Single Loop Operation (SLO) is used for the minimum CF statepoint D and at 55.0% of CF statepoint C." Section 2.2.5 "Power-to-Flow Ratio" states that statepoint C has a power density of 57.42 Megawatts Thermal/Million Pounds/Hour (MWt/Mlbm/hr), which is larger than the MELLLA+ Licensed Topical Report (LTR) limit of 50 MWt/Mlbm/hr, and states "this limitation is resolved in the near-term by applying additional conservatism to the cycle-Specific Safety Limit Minimum Critical Power Ratio (SLMCPR)." This "additional conservatism" is not documented in Section 2.2.5 of the Safety Analysis Report (SAR). Provide:

1. *Definition of the "additional conservatism" method.*
2. *A numerical example of the application of this conservatism.*
3. *A justification that the power distribution uncertainties at the higher power density are covered by the proposed method.*

Response to questions 1-3

The additional conservatism is included by incorporation of the +0.02 Safety Limit Minimum Critical Power Ratio (SLMCPR) adder specified by the Methods LTR SER Limitation and Condition 9.5 (Reference 1-1) for MELLLA+ plants with planned operation above a Power-to-Flow Ratio of 42 MWt/Mlbm/hr.

It should also be noted that the SLMCPR evaluation specified by the MELLLA+ LTR Safety Evaluation Report (SER) Limitation and Condition 12.6 (Reference 1-2) specifically requires an evaluation of the Two Loop Operation (TLO) SLMCPR using the highest NRC-approved core flow uncertainties (i.e. SLO uncertainties) at the off-rated condition that has the highest Power-to-Flow Ratio in the MELLLA+ operating domain.

Therefore, additional conservatism and justification that the power distribution uncertainties are acceptable is based on inclusion of the following:

- +0.02 SLMPCR adder for Power-to-Flow Ratio >42 MWt/Mlbm/hr,
- TLO SLMCPR evaluation at statepoint C (P-to-F = 57.42), and
- TLO SLMCPR evaluation with SLO uncertainties.

SLO is not allowed in the MELLLA+ operating domain, but the SLO uncertainties are used to evaluate the TLO SLMCPR for required statepoints in the MELLLA+ operating domain. The SLO SLMCPR evaluation will normally be lower than the TLO SLMCPR due to the off-rated evaluation with SLO uncertainties. It is anticipated that MELLLA+ plants will have the TLO SLMCPR and SLO SLMCPR be set equivalent in the technical specifications to avoid a SLO SLMCPR lower than a TLO SLMCPR.

See Figure 1.1 for a graphical depiction of the SLMCPR evaluation statepoints.

References

1-1. GE Hitachi Nuclear Energy, "Applicability of GE Methods to Expanded Operating Domains," NEDC-33173P-A, Revision 4, November 2012.

1-2. GE Hitachi Nuclear Energy, "General Electric Boiling Water Reactor Maximum Extended Load Line Limit Analysis Plus Licensing Topical Report," NEDC-33006P-A, Revision 3, June 2009.

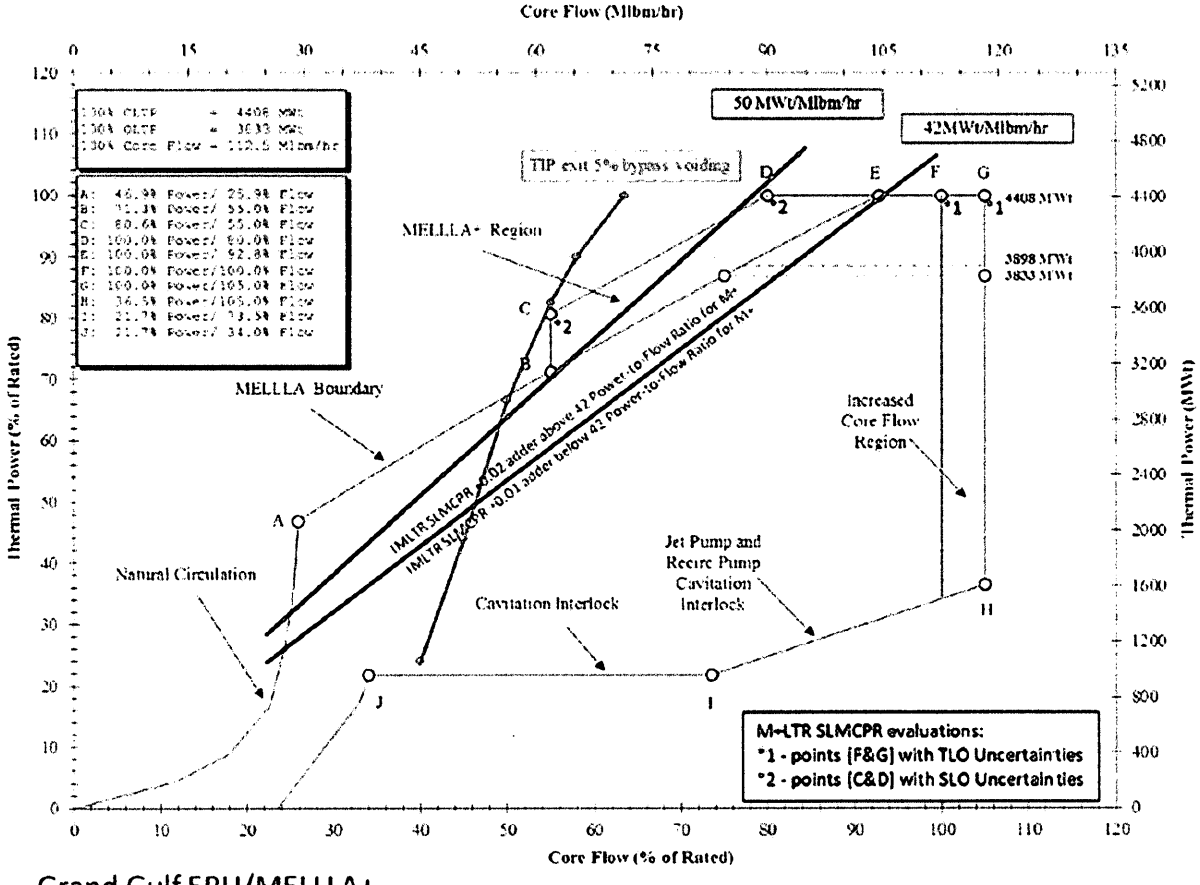

Figure 1.1. Graphical Depiction of the SLMCPR Evaluation Statepoints

2.0 SPECIFIC SAFETY LIMIT MINIMUM CRITICAL POWER RATIO ADDERS

Section 2.2.1 "Safety Limit Minimum Critical Power Ratio" states that "a +0.02 SLMCPR adder will be added to the cycle-specific SLMCPR."

1. *Provide a list of SLMCPR adders in MELLLA+ with respect to Operating Licensed Thermal Power (OLTP) conditions.*
2. *Specify which adders are part of the Extended Power Uprate (EPU), and which are MELLLA+ specific.*

Response to questions 1 and 2

Table 2.1 specifies the applicable Safety Limit Minimum Critical Power Ratio (SLMCPR) adders defined by the Methods LTR SER Limitation and Condition 9.5 (Reference 2-1) for operation with EPU/MELLLA and EPU/MELLLA+.

Figure 2.1 shows a graphical depiction of the SLMCPR evaluation statepoints and the Methods LTR penalties applied based on Power-to-Flow Ratio. Statepoints C&D [*2] in Figure 2.1 apply a +0.02 SLMCPR adder. Statepoints F&G [*1] in Figure 2.1 apply a +0.01 SLMCPR adder.

The most limiting SLMCPR of the four evaluation statepoints at BOC/MOC/EOC cycle exposure conditions will be used to set the technical specification SLMCPR. It is anticipated that MELLLA+ plants, will have the TLO SLMCPR and SLO SLMCPR be set equivalent in the technical specifications to avoid a SLO SLMCPR lower than a TLO SLMCPR.

Reference

2-1. GE Hitachi Nuclear Energy, "Applicability of GE Methods to Expanded Operating Domains," NEDC-33173P-A, Revision 4, November 2012.

Table 2.1. SLMCPR Adders

Licensing Basis	TLO & SLO SLMCPR Adder
EPU / MELLLA (PUSAR)	0.00
EPU / MELLLA+ with ≤42 MWt/Mlbm/hr (M+SAR)	0.01
EPU / MELLLA+ with >42 MWt/Mlbm/hr (M+SAR)	0.02

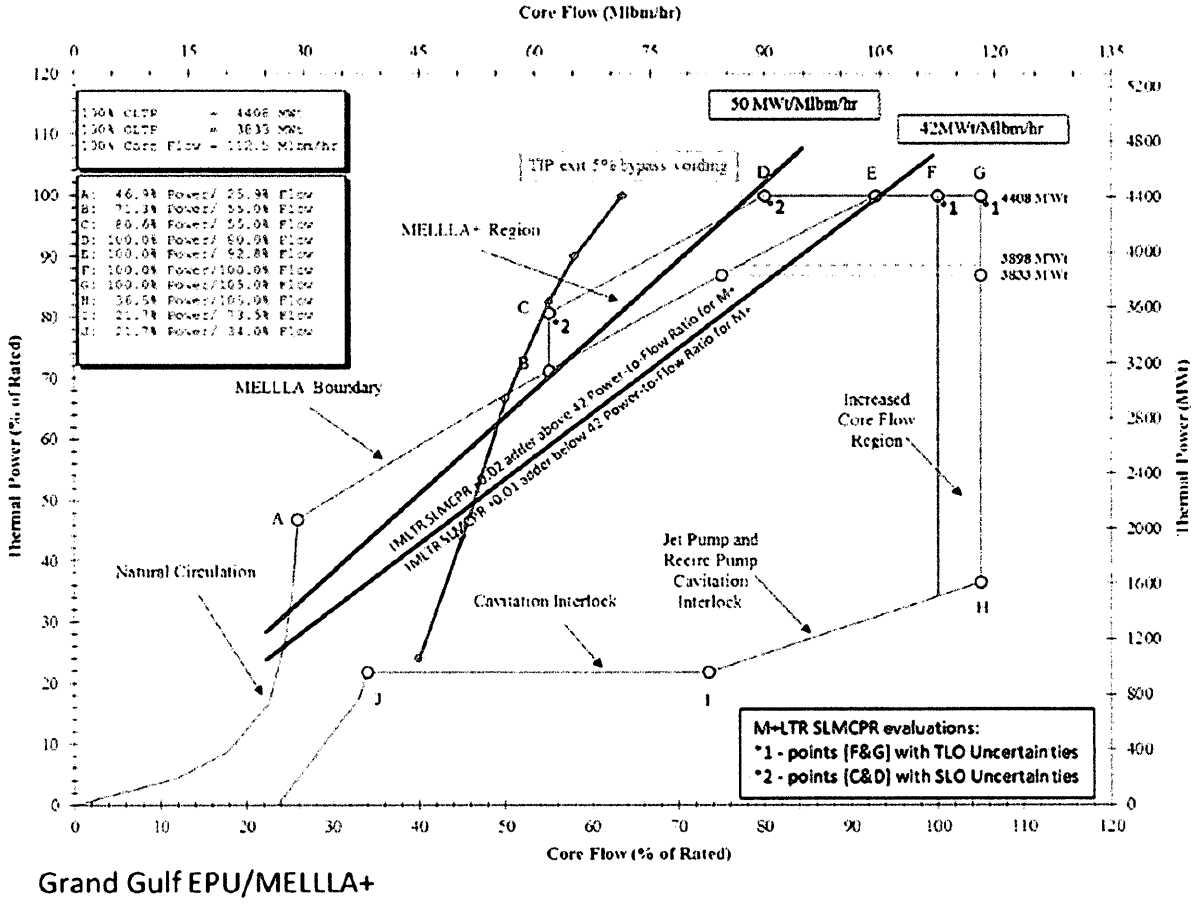

Figure 2.1. Graphical Depiction of the SLMCPR Evaluation Statepoints