RESOLUTION OF COMMENTS
ON DRAFT SAFETY EVALUATION
FOR TOPICAL REPORT (TR) NEDE-33006P, REVISION 2,
"MAXIMUM EXTENDED LOAD LINE LIMIT ANALYSIS PLUS"

By letter dated May 4, 2007, General Electric Hitachi Nuclear Energy (GHNE) provided comments on the draft SE for TR NEDE-33006P, Revision 2, "Maximum Extended Load Line Limit Analysis Plus." The following are the NRC staff's resolution of these comments.

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
|---|---|---|---|---|
| 1 | Page 100<br>Section 12.1<br><br>Also<br>Section 1.1.4<br>on page 4 | The plant-specific application will confirm that for operation within the boundary defined by the MELLLA+ upper boundary and maximum CF range, the GEXL-PLUS experimental database covers the thermal-hydraulic conditions the fuel bundles will experience, including, bundle power, mass flux, void fraction, pressure, and subcooling. If the GEXL-PLUS experimental database does not cover the within bundle thermal-hydraulic conditions, during steady state, transient conditions, and design-bases accident (DBA) conditions, GENE will inform the NRC and obtain the necessary data before submittal of the plant-specific MELLLA+ application.<br>In addition, the plant-specific application will confirm that the experimental pressure drop database covers the ranges of pressures the fuel bundles will experience for operation within the MELLLA+ domain.<br>With subsequent fuel designs, the plant-specific applications will confirm that the database supporting the critical power ratio (CPR) correlations covers the powers, flows and void fractions BWR bundles will experience for operation at and within the MELLLA+ domain, during steady state, transient, and DBA conditions. The plant-specific submittal will also confirm that the NRC staff reviewed and approved the associated CPR correlation. Similarly, the plant-specific application will confirm that the experimental pressure drop database does cover the range of pressures the fuel bundles will experience for operation within the MELLLA+ domain. | Delete.<br>GE currently implements this process and the scope is not the subject of a limitation. | Not accepted – limitation was not deleted. |
| 2 | Page 100<br>Section 12.2a | This limitation does not apply to modifications that may be licensed and implemented following MELLLA+ implementation. If there is a cumulative effect, the subsequent modification or operational change will confirm that there is no adverse impact to MELLLA+ operation. | Delete.<br>This is not a Limitation. 10CFR50.59 addresses changes to a plants licensing and design basis. | Not accepted – limitation was not deleted. |

Attachment

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| 3 | Page 101<br>12.3 | The plant-specific application shall provide the plant-specific thermal limits assessment and transient analysis results. Considering the timing requirements to support the reload, the fuel- and cycle-dependent analyses including the plant-specific thermal limits assessment may be submitted by supplementing the initial M+SAR. The SRLR for the initial MELLLA+ implementation cycle shall be submitted for NRC staff confirmation. | Delete.<br>This is addressed in the Methods LTR, which is required to implement M+. Further, the second sentence is practically not possible. The schedule will not support it, particularly since M+ SE's will probably have ACRS reviews | Not accepted – limitation was not deleted.<br><br>In MFN04-026, RAI 24 response, GE states that "the plant specific EPU/MELLLA+ application will provide plant-specific thermal limits assessment and transient analysis results." The basis for this response is covered in staff RAI 24. |
| 4 | Page 102<br>Section 12.5<br><br>Also<br><br>Page 25<br>Section 2.4.1 | Manual operator actions are not adequate to control the consequences of instabilities when operating in the MELLLA+ domain. A non-manual NRC-approved backup protection system must be provided, or the reactor core must be operated below the MELLLA+ domain if the primary stability protection system is declared inoperable. | Delete.<br>This Limitation is unnecessary since Limitation 12.2g requires an NRC-approved DSS and the NRC approval for the use of manual backs should be addressed in those applications. Further, the plant-specific analysis for DSS-CD, which is approved by the NRC, may have a manual BSP boundary that extends into the M+ region, although only slightly. | Not accepted – limitation was not deleted. |
| 5 | Page 102<br>Section 12.7<br><br>And Reactor Coolant Pressure Boundary Limitation in Section 3.5 on page 36 | Power uprate applicants must identify all other than Category "A" materials, as defined in NUREG-0313, Revision 2, that exist in its RCPB piping, and discuss the adequacy of the augmented inspection programs in light of the power uprate on a plant-specific basis. | Delete.<br>M+ is not a power uprate. | Limitation was reworded as follows:<br>MELLLA+ applicants must identify all other than Category "A" materials, as defined in NUREG-0313, Revision 2, that exist in its RCPB piping, and discuss the adequacy of the augmented inspection programs in light of the MELLLA+ operation on a plant-specific basis. |
| 6 | Page 102<br>Section 12.8a<br><br>Also<br>Section 4.3.1 | The plant-specific application will provide the Appendix K <u>and the licensing bases</u> PCT calculated at… | Delete or reword:<br>The plant-specific application will provide the Appendix K PCT ~~and the licensing bases~~ calculated at…<br>Because already addressed in Methods LTR. | Limitation reworded as follows:<br>The plant-specific application will provide the 10 CFR Part 50, Appendix K, and the <u>nominal</u> PCTs calculated at … |
| 7 | Page 102<br>Section 12.8a | The M+SAR will justify why the transition statepoint ECCS-LOCA response bounds the 55 percent CF statepoint. The M+SAR will provide discussion on what power/flow combination scoping calculations were performed to identify the limiting statepoints in terms of DBA-LOCA PCT response for the operation within the MELLLA+ boundary | Delete.<br>Already addressed in Methods LTR. | Not accepted – limitation was not deleted. |
| 8 | Page 102<br>Section 12.9b<br><br>Also<br><br>Section 4.3.1 | (1) <u>Both the licensing bases and</u> Appendix K PCTs should be reported … | Delete or reword:<br>(1) ~~Both the licensing bases and~~ Appendix K PCTs should be reported …<br>Already addressed in Methods LTR. | Limitation reworded as follows:<br>Both the <u>nominal</u> and Appendix K PCTs should be reported for all of the calculated statepoints, and … |

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| 9 | Page 13<br>Section 12.12<br><br>Also<br><br>Page 70<br>Section 9.1.1.2 | Plant-specific MELLLA+ applications shall identify where in the MELLLA+ upper boundary the bypass voiding greater than 5 percent will occur above the D-level. The licensee shall provide in the plant-specific submittal the operating actions and procedures that will mitigate the impact of the bypass voiding on the TIPs and the core simulator used to monitor the fuel performance. The plant-specific submittal shall also provide discussion on what impact the bypass voiding greater than 5 percent will have on the NMS as defined in Section 5.1.1.5 of this SE. | Delete.<br>Addressed by Methods LTR, SE Limitation 9.18 | Not accepted – limitation was not deleted. |
| 10 | Page 104<br>Limitation 12.15 | Plant-specific MELLLA+ implementations must perform best-estimate TRACG calculations on plant-specific basis, which account for all plant parameters, including water-level control strategy and all plant-specific EOP actions. If technical specifications allow for equipment out of service, this configuration must be used for these calculations. The licensee must ensure that all operability requirements (e.g., NPSH) by equipment assumed operable in the calculations are met.<br><br>PCT for both phases of the transient (initial over pressure and emergency depressurization) must be evaluated on a plant-specific basis with the TRACG ATWS calculation. | For plants that do not achieve hot shutdown prior to reaching the HCTL, plant-specific MELLLA+ implementations must perform best-estimate TRACG calculations on plant-specific basis, which account for all plant parameters, including water-level control strategy and all plant-specific EOP actions. If technical specifications allow for equipment out of service, this configuration must be used for these calculations. The licensee must ensure that all operability requirements (e.g., NPSH) by equipment assumed operable in the calculations are met.<br><br>PCT for both phases of the transient (initial over pressure and emergency depressurization) must be evaluated on a plant-specific basis with the TRACG ATWS calculation if the TRACG calculation is required.<br><br>Clarify TRACG requirement, consistent with LTR, Section 9.3.1 | Limitation was reworded, see Section 12.18 of Final SE. |

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| 11 | Page 104 Section 12.15 | Plant-specific MELLLA+ implementations must perform best-estimate TRACG calculations on plant-specific basis, which account for all plant parameters, including water-level control strategy and all plant-specific EOP actions. If TSs allow for EOOS, this configuration must be used for these calculations. The licensee must ensure that all operability requirements (e.g., NPSH) by equipment assumed operable in the calculations are met. | Only applies to plants that do depressurize, plant-specific MELLLA+ implementations must perform best-estimate TRACG calculations on plant-specific basis, which account for all plant parameters, including water-level control strategy and all plant-specific EOP actions. ~~If TSs allow for EOOS, this configuration must be used for these calculations.~~ The licensee must ensure that all operability requirements (e.g., NPSH) by equipment assumed operable in the calculations are met.<br>Basis:<br>Clarification consistent with Section 9.3.1 of the M+ LTR.<br><br>ATWS analysis do not use design basis accident analysis assumptions and nominal equipment availability is acceptable, consistent with NRC appro | (see Item 10 above) |
| 12 | Page 104 Section 12.17 | Licensee's that submit an EPU application that includes implementation of MELLLA+ should address the plant-specific risk impacts, including those associated with MELLLA+ implementation, within their EPU application consistent with approved guidance documents (e.g., NEDC-32424P-A, NEDC-32523P-A, and NEDC-33004P-A) and the Matrix 13 of RS-001. Likewise, licensees that have already been granted an EPU, who subsequently submit an application requesting to implement MELLLA+, should re-address the plant-specific risk impacts consistent with the approved guidance documents that was used in their approved EPU application and Matrix 13 of RS-001. | Licensee's that submit ~~an EPU application that includes implementation of~~ MELLLA+ application should address the plant-specific risk impacts~~, including those~~ associated with MELLLA+ implementation, ~~within their EPU application~~ consistent with approved guidance documents (e.g., NEDC-32424P-A, NEDC-32523P-A, and NEDC-33004P-A) and the Matrix 13 of RS-001~~. Likewise, licensees that have already been granted an EPU, who subsequently submit an application requesting to implement MELLLA+, should~~ and re-address the plant-specific risk impacts consistent with the approved guidance documents that was used in their approved EPU application and Matrix 13 of RS-001.<br>Basis:<br>EPUs and M+ applications are separate applications. The M+ LTR and associated SE do not address EPU applications. | Limitation was reworded as follows:<br>Licensees that submit a MELLLA+ application should address the plant-specific risk impacts associated with MELLLA+ implementation, consistent with approved guidance documents (e.g., NEDC-32424P-A, NEDC-32523P-A, and NEDC-33004P-A) and the Matrix 13 of RS-001 and re address the plant-specific risk impacts consistent with the approved guidance documents that were used in their approved EPU application and Matrix 13 of RS-001. If an EPU and MELLLA+ application come to the NRC in parallel, the expectation is that the EPU submittal will have incorporated the MELLLA+ impacts. |
| 13 | Page 105 12.19.1 | The allowed SRVOOS in the TS should be consistent with the number of SRVs assumed to be OOS in the ATWS analysis. For those plants that credit all SRVs in meeting the ATWS peak pressure acceptance criteria, the TS SRV LCO should reflect this assumption and the plant cannot operate at the MELLLA+ operating domain with any SRVOOS. | Delete.<br>Basis:<br>Inconsistent with the STS. ATWS is not addressed in the Technical Specfications.<br><br>If NRC desire to add ATWS to the STS should address on an industry wide basis. | Not accepted – limitation was not deleted.<br>Limitation was reworded; see Section 12.22.1 of Final SE. |

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| 14 | Page 105 Section 12.19.2 | The plant-specific ODYN and TRACG calculations must be verified to ensure that all plant-specific automatic settings are modeled properly. | Delete.<br>Unnecessary. Any analysis performed by GE must ensure it properly models or addresses the plant specific design and licensing basis of the applicable plant. | Not accepted – limitation was not deleted.<br>Limitation was renumbered as 12.22.2 in the Final SE. |
| 15 | Page 105 Section 12.19.5 | Verification that reactor operation will be maintained below this analysis limit must be performed for all plant-specific applications | Delete.<br>The first sentence is an adequate Limitation. Conformance with Limitations is addressed in plant applications. | Not accepted – limitation was not deleted.<br>Limitation was reworded; see Section 12.22.5 of Final SE. |
| 16 | Limitation 12.19.6 | LTR NEDC-33006P would be supplemented with bounding ATWS Instability analysis for future fuel designs including other vendor's fuel. | Delete.<br>Limitation 12.2d addressses the matter. Further, an LTR is application on a generic scale and a revision for limited use of fuel types may not be appropriate use of GE/NRC resources. | Not accepted – limitation was not deleted.<br>Limitation was reworded; see Section 12.22.6 of Final SE. |
| 17 | Limitation 12.19.9 | Special attention must be given to crucial safety systems like HPCI, and physical limitations like NPSH and back-pressure. | Special attention must be given to crucial safety systems like HPCI, and physical limitations like NPSH ~~and back-pressure.~~<br><br>What is the back-pressure limitation? | Limitation was reworded; see Section 12.22.9 of Final SE. |
| 18 | Limitation 12.19.11 | The plant-specific applications must justify the use of plant-specific suppression pool temperature limits for the ODYN and TRACG calculations that are higher than the HCTL limit for emergency depressurization. | Delete.<br>The ODYN calculations are routinely over the HCTL. These are performed conservatively. | (see Item 10 above) |
| 19 | Page 106 Section 12.20.3 | Perform cycle specific SLMCPR calculations in addition to the rated power and flow conditions at: 1) rated power and minimum CF conditions (e.g., 120 percent OLTP/85 percent rated CF) and 2) limiting off-rated conditions at 55 percent rated CF and corresponding MELLLA+ power level. | Delete.<br>Limitation 12.4 already addresses the matter | Limitation 12.4 was reworded and renumbered as 12.6. Limitation 12.20.3 was renumbered as 12.23.3 and refers to Limitation 12.6 of the Final SE. |
| 20 | Page 107 Section 12.20.4 | The plant-specific application will provide TS changes that will ensure that the operating flexibilities not allowed under the MELLLA+ conditions would be restricted in the TS.<br>For the best-estimate TRACG ATWS calculations, Plant-D must use a conservative plant-specific HSBW value. | Delete.<br>Proposed Technical Specifications are consistent with the scope of the STS. Revisions to the STS should be addressed on an industry-wide basis.<br><br>Further, as stated for 12.19.2, the needed to model conservatively is unnecessary for a Limitation. Any analysis performed by GE must ensure it properly models or bounds plant-specific design and licensing basis. | Limitation 12.20.4 was renumbered as 12.23.4 and refers to reworded 12.18. |
| 21 | Page xii, last sentence of the 1st paragraph, | The ATWS MSIVC data shown in Figure 9-12 is based on ODYN calculations. | The ATWS MSIVC data shown in Figure 9-12 is based on ~~ODYN~~ TRACG calculations.<br>Figure 9-12 is based on TRACG results. | Figure numbers were incorrect.<br>Sentence now reads:<br>The ATWS MSIVC data shown in Figure 9-3 and Figure 9-11 is based on ODYN calculations. |

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| 22 | Page xii, 3rd sentence of the 3rd paragraph | The NRC staff concluded that the plant-specific applications will include ATWS sensitivity analyses simulating the ATWS scenario consistent with the plant-specific ATWS EOPs, including the water level strategies employed at the plant, the depressurization if the HCTL is reached and the associated operator actions and systems actuations. | The NRC staff concluded that the plant-specific applications will include ATWS sensitivity analyses simulating the ATWS scenario consistent with the plant-specific ATWS EOPs, including the water level strategies employed at the plant, the depressurization if the HCTL is reached and the associated operator actions and systems actuations. TRACG analyses are performed for those plants that depressurize prior to achieving hot shutdown.<br>Basis:<br>Clarify when TRACG calculation is needed, consistent with Section 9.3.1 of the M+ LTR. | Limitation 12.18 language clearly specifies when the TRACG calculation is required. This clarification to the executive summary text is not required. |
| 23 | Page xii, 4rd paragraph | The plant-specific applications will include TRACG simulation following the EOPs, including depressurization if the HCTL is reached | The plant-specific applications will include TRACG simulation following the EOPs, including depressurization if the HCTL is reached before the reactor is shut down.<br>Basis:<br>Clarify when TRACG calculation is needed, consistent with Section 9.3.1 of the M+ LTR. | Limitation 12.18 language clearly specifies when the TRACG calculation is required. This clarification to the executive summary text is not required. |
| 24 | Executive Summary, ATWS Instability | Operation at the minimum CF at EPU power levels (120 percent OLTP, 80 percent CF) results in a significantly higher power following a 2RPT than when operating at OLTP. P | Operation at the minimum CF at EPU power levels (120 percent OLTP, 80 percent CF) results in a significantly higher power following a 2RPT than when operating at MELLLA at OLTP or EPU.<br>Clarification. Rod line is the same for OLTP and EPU in MELLLA | Comment incorporated. |
| 25 | Summary Section Page xiv Conclusion of Impact of MELLLA+ | Table 1-5 compiles the limitations in Section 12 and the limitations associated with relevant LTRs to the MELLLA+ operation | Delete.<br>There is no Table 1-5. | Sentence has been deleted. |
| 26 | Section 1.1.5 2nd paragraph 3rd sentence | ….., so that a flow reduction or a recirculation pump trip would revert to the pre-OLTP operation statepoints | ….., so that a flow reduction or a recirculation pump trip would revert approximately to the pre-OLTP operation statepoints.<br>Basis:<br>MELLLA boundary is only an approximation of a rod line | Comment incorporated. |

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| 27 | Section 1.1.5 3rd paragraph, 4th sentence page 6 | Control rod movements are typically performed a few times during the cycle to accomplish larger reactivity increases and the desired burn-up profiles. Because of the strong local power peaking that may result from control rod motion and its local effect on the fuel, control rod movements must be performed very slowly and at a reduced power level; otherwise, fuel clad failures may occur. | Control rod movements are typically performed a few times during the cycle to accomplish larger reactivity ~~increases~~ changes and the desired burn-up profiles. Because of the strong local power ~~peaking~~ change that may result from control rod motion and its local effect on the fuel, control rod movements ~~must~~ should be performed very slowly and at a reduced power level; otherwise, fuel clad failures may occur.<br>Basis:<br>Clarification<br>Reactivity changes can be either positive or negative.<br><br>Reducing power when moving blades it is a prudent precaution. | Comment incorporated. |
| 28 | Section 1.1.5 5th paragraph 2nd sentence page 6 | Therefore, reactor operators are forced to either move control rods very often or allow power reductions as burn-up takes place. | Therefore, reactor operators are forced to either move control rods very often or allow power ~~reductions~~ changes as burn-up takes place.<br>Basis:<br>Clarification.<br>Prior to the peak hot excess point in cycle power must be increased to shim reactivity. | Comment incorporated. |
| 29 | Page 10 Section 1.2.2.1.4 | However, the NRC staff notes that the SRLR is not submitted unless the NRC staff specifically requests it in request for additional information (RAI). | Delete or reword:<br>The results of the applicable reload fuel dependent analysese are provided to the NRC in the Core operating Limits Report.<br>Basis:<br>The NRC receives the COLR. | Comment not incorporated. The staff statement is accurate. The SRLR is only provided upon request. The COLR does not contain the analysis results presented in the SRLR |
| 30 | Page 10 Section 1.2.2.1.4 | Therefore, MELLLA+ LTR proposes that the NRC staff approve an EPU/MELLLA+ application without reviewing the plant's response for two significant operational changes. The NRC staff finds that the proposed disposition of the fuel- and cycle-dependent analyses to the standard reload process would not meet the agency's safety goals. | Delete.<br>The M+ application does not ask for NRC approval of two operational changes. The M+SAR addresses only the M+ change. | Comment not incorporated. The SE Section 1.2.2.3.2 places this issue in context. |
| 31 | Page 10 Section 1.2.2.1.4 | For the CPPU applications, the core and fuel performance assessments are deferred to the reload. | Delete or reword:<br>For the CPPU applications, the core and fuel performance assessments are performed on a representative core and the actual core and fuel performance assessments deferred to the reload.<br>Basis:<br>Deletion since the core assessments for the CPPU application has nothing do with the M+ application<br><br>The M+ application addresses only the M+ change. And an ELTR plant may license M+. | Sentence reworded as proposed. |

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| 32 | Page 10<br>Section<br>1.2.2.1.4 | Moreover, the current disposition to the reload is based on the assessment that the plants core and fuel response to the MELLLA+ conditions would not be significantly different from responses during EPU operation. | Moreover, the current disposition to the reload is based on the assessment that the plants core and fuel response to the MELLLA+ conditions ~~would not be significantly different from responses during EPU operation~~ are performed during standard reload licensing process.<br>Basis:<br>The disposition to the reload is because that is when the analysis is performed. For assessments of reload analyzes (e.g., Section 2.2.3), the M+ LTR does not close the issue with an assessment based on a EPU comparison. | Paragraph in Section 1.2.2.3.2 reworded, but not as proposed. See also disposition to Item 3 above. |
| 33 | Page 101<br>12.3<br><br>Also,<br>Page 11 | The plant-specific application shall provide the plant-specific thermal limits assessment and transient analysis results. Considering the timing requirements to support the reload, the fuel- and cycle-dependent analyses including the plant-specific thermal limits assessment may be submitted by supplementing the initial M+SAR. The SRLR for the initial MELLLA+ implementation cycle shall be submitted for NRC staff confirmation. | Delete or reword:<br>The plant-specific application shall provide the plant-specific thermal limits assessment and transient analysis results. ~~Considering the timing requirements to support the reload, the fuel- and cycle-dependent analyses including the plant-specific thermal limits assessment may be submitted by supplementing the initial M+SAR~~.<br>The SRLR for the initial MELLLA+ implementation cycle shall be ~~submitted for NRC staff confirmation.~~ provided with the SRLR or COLR, or it will be reported directly to the NRC as an attachment to the SRLR or COLR.<br>Basis:<br>Delete since it is a duplicate of the Methods Limitation<br>Not practical due to the schedule.<br>Reporting revised to be consistent with the Methods LTR | Comment not incorporated. Similar to Item 3 above. |
| 34 | Section 1.3.1<br>page 13<br>3 paragraph | (2) the higher bundle power-to-flow ratio will necessitate more restrictive off-rated flow biased thermal limits which will restrict the operating bundle power required to meet the thermal limits; and | (2) the higher bundle power-to-flow ratio ~~necessitate more restrictive off-rated flow biased thermal limits which~~ will reduce margin to the limit and will restrict the operating bundle power required to meet the thermal limits; and<br>Basis:<br>The offrated limit is not more severe, but the margin to the limit may decrease | Comment incorporated. |
| 35 | Section 1.3.3,<br>3rd and 4th<br>paragraphes | LTR NEDC-33006P states that single loop operation (SLO) in the MELLLA+ region is not proposed; however the available operating range for SLO in the MELLLA+ region may be considered on plant-specific basis. ...<br><br>The M+SAR will identify the applicable plant-specific operational flexibilities allowed for operation at the MELLLA+ domain. The acceptability of any proposed SLO operation will be evaluated on plant-specific bases. | Delete the 3rd paragraph<br><br>The M+SAR will identify the applicable plant-specific operational flexibilities allowed for operation at the MELLLA+ domain. The acceptability of any proposed ~~SLO operation will be evaluated on plant-specific bases~~<br>Basis:<br>M+ LTR excludes SLO in M+ domain. | Comment not incorporated. The SE language is consistent with the fact that SLO is not allowed under MELLLA+. |

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| 36 | Section 2.2.1.1 1st paragraph 2nd & 3r sentences | The control rod density would be higher resulting in different axial power | The control rod density would be ~~higher~~ lower resulting in different axial power.<br>Clarification | Comment not incorporated. See item 37 below. |
| 37 | 2.2.1.1 | The control rod density would be higher resulting in different axial power distribution than the EPU statepoint. | The control rod density would be ~~higher~~ different resulting in different axial power distribution than the EPU statepoint.<br>Clarification | Comment incorporated. |
| 38 | Section 2.2.1.2 | The OLMCPR is calculated by adding the change in the MCPR, due to the limiting AOO event, to the SLMCPR. | The OLMCPR is calculated by adding the change in the MCPR, due to the limiting AOO event, to the SLMCPR for non-TRACG methods.<br>Basis: TRACG uses a different method where the change in CPR is not simply added to the SLMCPR. | Comment incorporated. |
| 39 | Page 26 Section 2.4.1.1 2nd to last paragraph | The BSP methodology is an integral part of DSS-CD, which requires a non-manual backup option for operation in the MELLLA+ domain if the DSS-CD option is declared inoperable. | The BSP methodology is an integral part of DSS-CD, ~~which requires a non-manual backup option~~ for operation in the MELLLA+ domain if the DSS-CD option is declared inoperable.<br>Basis: The NRC approval for the use of manual backs should be addressed in the DSS applications. Further, the plant-specific analysis for DSS-CD may have a manual BSP boundary that extends into the M+ region, only slightly. The use of a manual BSP is approved in DSS-CD. | Comment incorporated. |
| 40 | Page 35 Section 3.5 1st paragraph | However, EPU applicants must identify all other than Category "A" materials that exist in its RCPB piping and discuss the adequacy of the augmented inspection programs in light of the EPU on a plant-specific basis. This NRC staff requirement is based on the fact that many BWR plants have other than type "A" materials installed in their RCPB piping and in some cases service induced flaws are present in the RCPB piping. The presence of service flaws induced flaws in RCPB piping does not meet the original construction Code criteria, and therefore a plant-specific evaluation is required. | Delete.<br>M+ LTR and associated SE is not applicable to EPU applications | Paragraph reworded instead of deleted. See Section 3.5.1 of the Final SE. |
| 41 | Page 45 Section 4.3.1, *ECCS-LOCA PCT Reporting*, Paragraph 3 and Section 4.3.1, *ECCS-LOCA Reporting Limitation*, (1) | …(1) both the licensing and 10 CFR Part 50, Appendix K, PCTs should be reported for all of the calculated statepoints; and (2)… | …(1) ~~both the licensing and~~ 10 CFR Part 50, Appendix K, PCTs should be reported for all of the calculated statepoints; and (2)…<br>Basis:<br>Revise to be consistent with the Methods LTR SE. | Reworded as follows:<br>(1) both the nominal and Appendix K PCTs should be reported for all of the calculated statepoints |

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| 42 | Section 12.8 *ECCS-LOCA Off-Rated Multiplier Limitation (from Section 4.3.1) Subsection a)* | The plant-specific application will provide the Appendix K and the licensing bases PCT calculated at… | The plant-specific application will provide the Appendix K ~~and the licensing bases~~ PCT calculated at…<br>Basis:<br>Revise to be consistent with the Methods LTR SE | Reworded as follows:<br>The plant-specific application will provide the 10 CFR Part 50, Appendix K, and the nominal PCTs calculated … |
| 43 | Section 12.9, *ECCS-LOCA Reporting Limitation (from Section 4.3.1)*, Para 1 | (1) Both the licensing bases and Appendix K PCTs should be reported … | (1) ~~Both the licensing bases and~~ Appendix K PCTs should be reported …<br>Basis:<br>Revise to be consistent with the Methods LTR SE | Reworded as follows:<br>Both the nominal and Appendix K PCTs should be reported … |
| 44 | Section 5.1.1.4 2nd paragraph | ….. because the control rod drop accident consequence is minimized and the SAFDLs are protected in the event of a reactivity initiated event | ….. because the control rod drop accident consequence is minimized at low power and the SAFDLs are protected at high power in the event of a reactivity initiated event<br>Basis:<br>Clarify that SAFDLs apply only at high power. | Comment not incorporated.<br>The staff disagrees with the basis; SAFDLs apply at all powers. If the reactivity-initiated event is more limiting at low power, then SAFDL limit at that power. |
| 45 | 5.1.1.5.1 Steady State Bypass Voiding Paragraph 2 | By limiting the bypass voiding in the LPRMs to less than 5 percent during steady state ensures the accuracy and reliability of the NMS during the sustained normal operation. | The instrumentation specification design basis limits the presence of bypass voiding to 5% (LRPM levels). Limiting the bypass voiding to less than 5% for long-term steady operation ensures that instrumentation is operated within the specification. For EPU and MELLLA+ operation, the bypass voiding will be evaluated on a cycle-specific basis to confirm that the void fraction remains below 5 percent at all LPRM levels when operating at steady-state conditions within the MELLLA+ upper boundary. The highest calculated bypass voiding at any LPRM level will be provided with the plant-specific SRLR.<br>Basis: Same as IMLTR SE. | Comment incorporated. |
| 46 | Page 57 Section 5.1.1.5 Bypass Voiding Above the D-level Limitation | Bypass Voiding Above the D-level Limitation | Delete section.<br>LPRM calibration from the TIP is of interest. EPU/M+ have no bearing on this concern as it exists in unrelated parts of the power/flow map for BWRs today. | Comment not incorporated. This section explains the rationale for the bypass voiding limitation as well as the impact on thermal TIPs and power distribution uncertainties. This topic was not covered by the LTR and will be justified in plant-specific basis. |

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
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| 47 | Page 57 Section 5.1.1.5 Impact of Bypass Voiding Greater than 5 Percent and Power | In addition, the gamma scan benchmarking data will not represent operation at the lower flow statepoints earlier in the cycle. Therefore, the power distribution uncertainties applied at the MELLLA+ boundary between the 80 percent and the 50 percent CF statepoints where the voids will be highest cannot be validated by gamma scan data, specifically for the different uncertainty components (e.g., σpeak and σbundle) as applied to the SLMCPR. The same power distribution uncertainties applied at the rated conditions are applied at the reduced CF statepoints, and GENE did not propose an alternative approach. | ~~In addition, the gamma scan benchmarking data will not represent operation at the lower flow statepoints earlier in the cycle. Therefore, the power distribution uncertainties applied at the MELLLA+ boundary between the 80 percent and the 50 percent CF statepoints where the voids will be highest cannot be validated by gamma scan data, specifically for the different uncertainty components (e.g., σpeak and σbundle) as applied to the SLMCPR. The same power distribution uncertainties applied at the rated conditions are applied at the reduced CF statepoints, and GENE did not propose an alternative approach.~~<br><br>The gamma scan benchmarking data will not directly characterize operation at the MELLLA+ boundary. However, such benchmarking will characterize the cumulative effects of higher power (EPU) and/or lower flow statepoints (MELLLA+) earlier in the cycle as they affect isotope production and any effects on the core monitoring instrumentation.<br>Basis:<br>The gamma scan benchmarking confirming sigmaPAL is performed with adaption to TIPs to imitate core monitoring as closely as possible. If additional noise in the instrumentation exists as a result of bypass voiding, the effects are included in the benchmark and resulting uncertainty. Similarly, the isotopics are a direct result of operation at EPU/MELLLA+ and the core operation strategy. Therefore, gamma scans are sufficient to validate the SLMCPR power distribution uncertainties and remove the SLMCPR limitations for EPU and MELLLA+. | Comment not incorporated. The staff agrees that operation with higher power lower flow condition affects the isotopic composition and the gamma scan results. However, it only captures the specific power distribution at the latter part of the cycle (approximately the last 60 days). |

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
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| 48 | 5.1.1.5 Impact of Bypass Voiding Greater than 5 Percent and Power 2nd paragraph 4th sentence | The SLMCPR calculation shows sensitivity to CF uncertainties; the CF uncertainty increases with decreasing CF (See Figure 2-6 of this SE). The higher CF uncertainty applied to the non-rated conditions should be high enough to compensate for the difficulties associated with benchmarking the reduced CF conditions. Therefore, the NRC staff concludes that for the 55 percent CF statepoint and along the MELLLA+ upper boundary up to the minimum CF statepoint, the highest reduced CF uncertainty will be applied. This is consistent with the CF uncertainty applied to the SLO operation. The NRC staff finds with the increased CF uncertainty applied consistently at the MELLLA+ upper boundary statepoints, the application of the rated power distribution uncertainty for the specific components are acceptable. | The SLMCPR calculation shows sensitivity to CF and FWF uncertainties; the CF and FWF uncertainties increase with decreasing CF and FWF (See Figure 2-6 of this SE). The higher CF and FWF uncertainties must be applied to the non-rated conditions ~~should be high enough to compensate for the difficulties associated with benchmarking the reduced CF conditions.~~ SLMCPR calculation required to be performed as noted in section 2.2.1.1. However, the power distribution is more skewed and thus less limiting at off-rated conditions and this has been shown to mitigate the SLMCPR requirement. Therefore, the NRC staff concludes that for the 55 percent CF statepoint and along the MELLLA+ upper boundary up to the minimum CF statepoint, the corresponding CF and FWF uncertainties will be applied along with the consistent power distributions, and the limiting SLMCPR value must be used in setting the OLMCPR. The NRC staff finds with the increased CF and FWF uncertainties applied consistently at the MELLLA+ upper boundary statepoints, the application of the rated power distribution uncertainty for the specific components are acceptable.<br>Basis:<br>The SLMCPR value is based on the most limiting result in the operating region considering consistent inputs at each condition. Therefore, it is not reasonable to apply the CF uncertainty at 55 percent flow when the limiting power distribution ocurrs at rated power, where the largest number of fuel rods are near the limiting one. | Comment partially incorporated.<br>The staff disagrees with the basis. GE Part 21 report (MFN04-081) that the power distribution uncertainty at the low flow conditions can result in higher SLMCPR values. The SLMCPR methodology for operation at lower core flow conditions needs to be updated.<br><br>The first sentence was reworded as proposed:<br>The SLMCPR calculation shows sensitivity to CF and FWF uncertainties; the CF and FWF uncertainties increase with decreasing CF and FWF (See Figure 2-6 of this SE). The higher CF and FWF uncertainties must be applied to the non-rated conditions, and should be high enough to compensate for the difficulties associated with benchmarking the reduced CF conditions. . |

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
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| 49 | 5.1.1.5 Impact of Bypass Voiding Greater than 5 Percent and Power 2nd paragraph 5th sentence to end of paragraph | However, this does not exclude confirmation that σp4b is applicable where bypass voiding above the D-level is not present, such as the minimum CF statepoint. In addition, the NRC staff assessment is based on the SLMCPR calculational methodology in which the base thermal-hydraulic condition at the minimum CF and the 55 percent CF statepoints are determined and perturbed according to the associated uncertainty components. Section 2.2.1.1, "SLMCPR," of this SE also contains discussion on the CF uncertainties.<br><br>The plant-specific application will provide confirmation of the impact of bypass voiding on the reliability of the NMSs as discussed above. Based on the conditions noted and the assessment covered in this section, the NRC staff accepts the adequacy of the NMS for operation at MELLLA+ condition. | ~~However, this does not exclude confirmation that σp4b is applicable where bypass voiding above the D-level is not present, such as the minimum CF statepoint. In addition, the NRC staff assessment is based on the SLMCPR calculational methodology in which the base thermal-hydraulic condition at the minimum CF and the 55 percent CF statepoints are determined and perturbed according to the associated uncertainty components. Section 2.2.1.1, "SLMCPR," of this SE also contains discussion on the CF uncertainties.~~<br><br>~~The plant-specific application will provide confirmation of the impact of bypass voiding on the reliability of the NMSs as discussed above.~~ Based on the conditions noted and the assessment covered in this section, the NRC staff accepts the adequacy of the NMS for operation at MELLLA+ condition.<br>Basis:<br>The adequacy of the calculation with voids is addressed in the IM qualification LTR.<br><br>GE has committed to demonstrating that the voids will be 5% or less, such that the effects on the NMS are not significant, then the adequacy of the NMS is concluded to be acceptable. | Comment not incorporated. The SE evaluation remains valid. The comment does not provide an alternative solution to the thermal TIP uncertainty above the D level. |
| 50 | Table 6-2 1st row, 1st column | SLCS cold SDM | SLCS ~~cold~~ SDM.<br>Clarification to be consistent with Section 2.3 of the M+ LTR.<br>See next comment | Comment incorporated. |
| 51 | Table 6-2 2nd row | Hot shutdown boron weigh<br>Potential increase in boron requirements. Reflected in cycle-specific EOPs<br>Cycle Specific | Delete or<br>~~Cycle~~ Plant Specific<br>Clarification to be consistent with Section 2.3 of the M+ LTR | Comment incorporated. |
| 52 | 6.5.1.1, 1st sentence | The required reactor boron concentration for cold and hot SDM depends on the fuel design and core loading, and the boron requirements will be evaluated for each fuel reload | The required reactor boron concentration for core ~~cold and hot~~ SDM depends on the fuel design and core loading, and the boron requirements will be evaluated for each fuel reload.<br>Basis: Clarification consistent with M+ LTR Section 6.5.1.1.I'm | Comment incorporated. |

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
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| 53 | Section 9.1.1.1, second paragrah | Transients performed during the reload are not limited to the above listed transients. Fuel Loading Errors (FLE) are also evaluated as an AOO, during reload analysis in accordance with GESTAR II licensing methodology. | Transients performed during the reload are not limited to the above listed transients. Fuel Loading Errors (FLE) are also evaluated as an AOO, during reload analysis in accordance with GESTAR II licensing methodology. GESTAR amendment 28 was just approved that re-categorized the FLE as an accident and may no longer be considered an AOO.<br>Basis:<br>FLE may now be evaluated as an infrequent event. | Comment partially incorporated. Section rewritten as follows: GESTAR Amendment 28 was recently approved which re categorized the FLE as an accident and may no longer be considered an AOO. The NRC staff will follow up on this issue on plant-specific basis. |
| 54 | Section 9.1.1.3, 5th paragraph | In addition, for evaluation of margins available in the fuel design limits at off-rated conditions, plant-specific applications shall provide a quarter core map (assuming core symmetry) showing the following parameters at the limiting off-rated conditions: bundle power, bundle operating LHGR, and MCPR for BOC, MOC, and EOC. | The plant-specific applications will provide prediction of key parameters for cycle exposures for operation at EPU and MELLLA+. The plant-specific prediction of these key parameters will be ~~compared~~ plotted against the EPU referenced plant experience base and MELLLA+ operating experience, if available. For evaluation of the margins available in the fuel design limits, plant-specific applications will also provide quarter core map (assuming core symmetry) showing bundle power, bundle operating LHGR, and MCPR for BOC, MOC, and EOC. Since the minimum margins to specific limits may occur at exposures other than the traditional BOC, MOC, and EOC, the data will be provided at these exposures<br>Basis:<br>Revise consistent Methods. Seems a reference to the Methods LTR would be adequate without the repetition. | Comment incorporated. Section revised as proposed for consistency in lieu of deletion, because statement is relevant to the MELLLA+ SE. |
| 55 | Section 9.1.1.5, TM limits | Operation at MELLLA+ will result in a more limiting transient response since the steam flow increases but the pressure relief capacity remains fixed | Delete sentence or reword as follows:<br>Operation at MELLLA+ ~~will~~ may result in a more limiting transient response ~~since the steam flow increases but the pressure relief capacity remains fixed~~<br>Basis: MELLLA+ does not necessarily result in a more limiting response and the steam flow does not increase with M+. | Not applicable. Text in comment does not exist in Section 9.1.1.5 of the Draft SE. |

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
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| 56 | 9.3.1.1, Figure 9-1, 1st paragraph | Operation in the MELLLA+ domain is detrimental to the ATWS performance of the reactor. One of the first safety actions taken in an ATWS is a 2RPT. When operating in the MELLLA+ corner, the final power after a 2RPT is significantly higher than when operating at OLTP. This is illustrated in Figure 9-1 of this SE. This higher power following the 2RPT results in a higher integrated heat load to the containment, which is detrimental to safety performance. | Operation in the MELLLA+ domain is detrimental to the ATWS performance of the reactor. One of the first safety actions taken in an ATWS is a 2RPT. When operating in the MELLLA+ corner, the final power after a 2RPT is significantly higher than when operating at OLTP. This is illustrated in Figure 9-1 of this SE. This higher power following the 2RPT results in a higher integrated heat load to the containment, which is detrimental to safety performance. The OLTP corner represents the nominal operating conditions, which are not the maximum rod lines used in all the licensing basis analysis.<br>Basis:<br>The OLTP condition in Figure 9-1 is consistent with a nominal rod line. Therefore, the power/flow conditions after 2RPT for the M+ corner involves the operation mode changes from nominal to ELLLA to MELLLA to M+. The actual licensing reference point should be OLTP/MELLLA, which will show a less drastic change. | Comment not incorporated. Figure 9-1 is an illustration, which shows graphically that the power following an RPT is higher at MELLLA+ than at OLTP at nominal CF. |
| 57 | 9.3.1.1, 2nd paragraph | However, as a first order approximation, one could extrapolate the containment relative heat load as being proportional to the steady state power-to-flow ratio. For example, operating in the corner of MELLLA+ domain (120 percent OLTP, 80 percent CF) results in approximately 150 percent higher containment heat load than at the OLTP at rated CF. | However, as a first order approximation, one could extrapolate the containment relative heat load as being proportional to the steady state power ratio. For example, operating in the corner of MELLLA+ domain (120 percent OLTP, 80 percent CF) results in approximately ~~150~~ 125 percent higher containment heat load than at the OLTP at the latest licensing maximum rod lines, which is typically MELLLA, or 121 percent rod lines.<br>Basis: This logic of containment heat load is proportional to the power/flow ratio is not valid. The static ratio of power/flow conditions cannot be maintained over the range of dynamic reactor system response through the ATWS events. The impact of the M+ operating domain is most prominent during the initial stage of the flow coast down following 2RPT. However, the initiation of reactor vessel level control and boron injection will achieve a new quasi-steady state operating condition before the water level is restored to the nominal setpoint. This quasi-steady state is largely independent of the initial operating domain. The sensitivity study presented in Figure 9-4 amply demonstrates that the heat load injected to the wetwell/containment for the M+ conditions is not much higher than the OLTP conditions. | Comment not incorporated. The staff disagrees with GE's basis. The long term heat load to containment is proportional to the core-average void fraction required to maintain the reactor critical. This void fraction is determined by the initial power/flow ratio. In MELLLA+, the rod line is higher.<br><br>The comparison of MELLLA+ rod line with OLTP at rated CF conditions is valid and representative of early reactor operation representative of ATWS analyses in which the ATWS rule is based. |

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
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| 58 | 9.3.1.1, page 75, 6th paragraph | The MELLLA+ operation may increase the containment heat load by up to 150 percent (compared to OLTP operation at 100 percent flow); thus making the event even more challenging. An option that the NRC staff strongly encourages is to increase the boron concentration for the SLCS so that the integrated heat load to containment remains constant. For example, if the power density is increased by 10 percent, the boron injection time must be reduced by 10 percent so the integrated heat load remains constant. | The MELLLA+ operation may increase the containment heat load by up to ~~150~~ 125 percent (compared to OLTP operation ~~100 percent flow~~ at the current licensed maximum rod line); thus making the event even more challenging. An option that the NRC staff strongly encourages is to increase the boron concentration for the SLCS so that the integrated heat load to containment remains constant. For example, if the ~~power density~~ rod line is increased by 10 percent, the boron injection time must be reduced by 10 percent so the ~~integrated heat load~~ time to inject hot shutdown boron weight remains constant.<br>See above basis | Comment not incorporated. The increase in Boron concentration is intended to maintain the heat load to containment constant. To maintain the heat load constant, the time to inject the hot shutdown boron weight cannot remain constant, it must be reduced. |
| 59 | Section 9.3.1.1, 6th paragraph | BWR ATWS events tend to challenge the suppression pool temperature and peak containment pressure limits, because the SLCS is relatively slow and takes up to 2400 seconds to inject the HSBW. The MELLLA+ operation may increase the containment heat load by up to 150 percent (compared to OLTP operation at 100 percent flow); thus making the event even more challenging. An option that the NRC staff strongly encourages is to increase the boron concentration for the SLCS so that the integrated heat load to containment remains constant. For example, if the power density is increased by 10 percent, the boron injection time must be reduced by 10 percent so the integrated heat load remains constant. | ~~BWR ATWS events tend to challenge the suppression pool temperature and peak containment pressure limits, because the SLCS is relatively slow and takes up to 2400 seconds to inject the HSBW.~~ Because of the larger power-to-flow ratio when operating at the MELLLA+ corner, which results in approximately 150 percent containment higher heat load, one could expect that the HCTL will be reached in approximately 80 percent (or 120(MELLLA analyses are based on 121% rod line)/150) of the time that it would take to reach HCTL when operating at OLTP. The MELLLA+ operation may increase the containment heat load by up to ~~150~~ 125 percent (compared to OLTP operation at ~~100~~ 75 percent flow); thus making the event even more challenging.<br>An option that the NRC staff strongly encourages is to increase the boron concentration for the SLCS so that the integrated heat load to containment remains constant. ~~For example, if the power density is increased by 10 percent, the boron injection time must be reduced by 10 percent so the integrated heat load remains constant~~ This makes the impact of M+ on the suppression pool negligible and TRACG calculation is not required.<br>Basis: Comparison should be between EPU/MELLLA, not the original rated rod line.<br>Also, If the boron injection time decreased to make the pool response consistent with EPU, then TRACG calculation should not be required. | Comment not incorporated. Limitation 12.18 language clearly specifies when the TRACG calculation is required. This clarification to the SE text is not required. |

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
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| 60 | Section 9.3.1.1, sixth paragraph | BWR ATWS events tend to challenge the suppression pool temperature and peak containment pressure limits, because the SLCS is relatively slow and takes up to 2400 seconds to inject the HSBW. | BWR ATWS events tend to challenge the suppression pool temperature limit ~~and peak containment pressure limits~~, because the SLCS is relatively slow and takes up to 2400 seconds to inject the HSBW.<br>Basis:<br>Pressure limits are not challenged for ATWS. | Comment not incorporated. The suppression pool temperature limit is set based on containment pressure criteria. If the suppression pool temperature limit is challenged, the containment pressure limit is challenged as well. |
| 61 | 9.3.1.1, page 75, 9th paragraph | Figure 9-3 shows that operation at MELLLA+ conditions result in a significantly increased pressure peak following containment isolation, which is caused by the increase in steam flow. | Figure 9-3 shows that operation at MELLLA+ conditions result in a significantly increased pressure peak following ~~containment~~ reactor vessel isolation, which is caused by the increase in steam flow and less effective flow coast down following 2RPT to reduce power at a higher rod line.<br>Basis: Clarification<br>The other cause of higher peak vessel pressure is the less effective power reduction mechanism after 2RPT at a higher rod line. | Comment partially incorporated. The paragraph has been reworded to mention the RPT effectiveness as one of the contributing factors. The reduced effectiveness of the RPT is explained in other sections of the SE. However, the main difference between the two lines drawn in Figure 9-3 is the increased steam flow between OLTP and EPU. In addition, the OLTP case corresponds to 75% flow; therefore, the effectiveness of the RPT is lower for the OLTP case in Figure 9-3 than for the MELLLA+ case in Figure 9-3. |
| 62 | Section 9.3.1.1, 8th paragraph | Figure 9-3 shows that operation at MELLLA+ conditions result in a significantly increased pressure peak following containment isolation, which is caused by the increase in steam flow. | Figure 9-3 shows that operation at MELLLA+ results in a significantly increased pressure peak following containment isolation, which is caused by the ~~increase in steam flow~~ less effective RPT at the higher operating rod line with MELLLA+.<br>Basis:<br>Steam flow in not increased with MELLLA+. The high pressure is caused by less effective RPT at the high rod line. | This comment is a repetition of the above one, only with a different recommended solution. See resolution above. |
| 63 | Section 9.3.1.1, 10th paragraph | Note that the rod lines depicted in this figure are not the rated rod lines, so they do not represent a valid comparison between OLTP and MELLLA+. | Note that the rod lines depicted in this figure are not the rated rod lines, so they do not represent a valid comparison between OLTP and MELLLA+. However, this is a valid MELLLA to MELLLA+ comparison, which is the significant change.<br>Basis:<br>The M+ applications assess the change from an EPU condition to a M+ condition Therefore, the comparison should be between M+ and MELLLA. | Comment not incorporated. Figure 9-4 compares suppression pool temperatures between 100%P/75% and 100%P/85%F. It compares the worst possible MELLLA power/flow ratio versus a particular non-limiting implementation of MELLLA+. The LTR requests staff approval for operation down to 80% flow. This reinforces the staff position that the ATWS event must be evaluated on a plant-specific basis with each particular plant settings. |

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
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| 64 | 9.3.1.2.1, 2nd paragraph | During transient events, the preferred source of cold water is the condenser; however, the condenser is not a safety source of water, and it may not be available for some events. The safety source of water for most ESFs is the suppression pool. As the suppression pool heats up, so does the cooling water available for the ESF systems like the ECCS. | Delete.<br>The current assumption for ATWS analysis is that there is no additional failure other than the AOO events leading to ATWS and the failure of control rod scram, plus other TS equipment OOS. All other systems are assumed to function as designed. The high pressure makeup flow is drawn from condensate storage tank and this assumption is valid and consistent with NRC guidance for ATWS. | Comment not incorporated. The SE statement is correct. The SE does not require any changes in the ATWS analyses assumptions. It simply states what safety-grade sources of water are available. |
| 65 | Section 9.3.1.2.2 1st paragraph | For example, in some plants, the RHR system is not available without off-site power, resulting in a higher suppression pool temperature. | For example, in some plants, the RHR system operates at a reduced capacity without off-site power, resulting in a higher suppression pool temperature.<br>Basis:<br>Emergency diesel generators will provide the power source for the RHR system if off-site power is not available. They may not be able to power the whole complement of the RHR pumps, but it will enable the RHR operating at a reduced capacity. | Comment incorporated. |
| 66 | 9.3.1.2.3, 3rd paragraph | During the depressurization phase, the operator is instructed to stop all sources of coolant injection into the vessel (except the SLCS) to prevent overflowing of the vessel caused by the flashing. | During the depressurization phase, the operator is instructed to stop all sources of coolant injection into the vessel (except the SLCS, CRD and RCIC) to prevent overflowing of the vessel caused by the flashing.<br>Basis: EPG/SAG Step C5-5.1 | Comment incorporated. |
| 67 | 9.3.1.2.3, 3rd paragraph<br><br>Also 9.3.1.2.4, end of 2nd paragraph<br><br>9.3.1.2.4, 2nd last paragraph | Figure 9-6 of this SE shows the peak fuel clad temperature for three different strategies: TAF+5', TAF, and TAF-2' | Figure 9-6 of this SE shows the peak fuel clad temperature for two different strategies: TAF+5' and TAF. The TAF-2' corresponds to the minimum steam cooling water level and is provided as the worst-case scenario.<br>Basis: EPG/SAG Step C5-5.1 | Comment not incorporated. EPG implementations allow control between the MSCWL and 2 feet below the sparger. While the staff recognizes that controlling water level at MSCWL would be difficult and not a recommended strategy, the SE statement is accurate as a postulated (though not recommended) strategy. |
| 68 | 9.3.1.2.3, last paragraph | The red and green lines show the suppression pool temperature calculated by the licensing code ODYN with and without RHR | The red and black lines show the suppression pool temperature calculated by the licensing code ODYN with ~~and without RHR~~ CONTAIN and STEMP pool heating codes. Both codes include the function of RHR pool cooling.<br>Basis: STEMP code also models the RHR pool cooling function. | Comment incorporated. |

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
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| 69 | 9.3.1.3, last paragraph | Plants operating at or below MELLLA may experience the need to depressurize reactor if the suppression pool reaches the HCTL, even if these plants meet the specific set of requirements stipulated in 10 CFR 50.62. Thus, the NRC staff recommends the use of ODYN licensing calculations, to be supplemented by TRACG best-estimate confirmatory calculations that include all operator actions. | Plants operating at or ~~below~~ above MELLLA may experience the need to depressurize reactor if the suppression pool reaches the HCTL, even if these plants meet the specific set of requirements stipulated in 10 CFR 50.62. Thus, the NRC staff recommends the use of ODYN licensing calculations, to be supplemented by TRACG best-estimate confirmatory calculations that include all operator actions for M+ implementation.<br>Basis: The M+ LTR and associated SE are not applicable to EPU operation. | Comment incorporated. |
| 70 | Section 9.3.1.3 Limitation a) | Plant-specific MELLLA+ implementations must perform best-estimate TRACG calculations on plant-specific basis, which account for all plant parameters, including water-level control strategy and all plant-specific EOP actions. | Plant-specific MELLLA+ implementations must perform best-estimate TRACG calculations on plant-specific basis if hot shutdown does not occur before depressurization, which account for all plant parameters, including water-level control strategy and all plant-specific EOP actions.<br>Basis: Clarification on TRACG requirement | Comment not incorporated. Limitation 12.18.a language clearly specifies when the TRACG calculation is required. This clarification to the SE text is not required. |
| 72 | Section 9.3.1.3 Limitation c. | The PCT for both phases of the transient (initial over pressure and emergency depressurization) must be evaluated on a plant-specific basis with the TRACG ATWS calculation. | PCT for both phases of the transient (initial over pressure and emergency depressurization) must be evaluated on a plant-specific basis ~~with the~~ if the TRACG ATWS calculations are required for the plant.<br>Basis: Clarification on TRACG requirement | Comment not incorporated. Limitation 12.18.c language clearly specifies when the TRACG calculation is required. This clarification to the SE text is not required. |
| 72 | Section 9.3.1.4 | Therefore, the NRC staff requires best-estimate ATWS TRACG calculations on plant-specific basis, which account for all plant parameters, including water-level control strategy, all plant-specific EOP actions, and equipment out of service allowed by technical specifications, to demonstrate compliance with the requirements of 10 CFR 50.62. | Therefore, for plants that do not achieve hot shutdown prior to reaching the HCTL, the NRC staff requires best-estimate ATWS TRACG calculations on plant-specific basis, which account for all plant parameters, including water-level control strategy, all plant-specific EOP actions, and equipment out of service allowed by technical specifications, to demonstrate compliance with the requirements of 10 CFR 50.62.<br>Basis: Clarify TRACG requirement, consistent with LTR, Section 9.3.1 | Comment not incorporated. Limitation 12.18 language clearly specifies when the TRACG calculation is required. This clarification to the SE text is not required. |
| 73 | Section 9.3.1.4 | For example, if the power density is increased by 10 percent, the boron injection time must be reduced by 10 percent so the integrated heat load remains constant. | For example, if the power density is increased by 10 percent, the boron injection time must be reduced by 10 percent so the integrated heat load remains constant. This implementation keeps ATWS results approximately unchanged and ODYN results are used to demonstrate this.<br>Basis: Clarification on how to demonstrate recommendation. | Comment not incorporated. Limitation 12.18 language clearly specifies when the TRACG calculation is required. This clarification to the SER text is not required. |

| # | Location in Draft SE | Draft SE Text | GHNE Comment and Basis | NRC Staff Resolution |
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| 74 | Section 5.1 2nd paragraph on page 55 | The IRM system provides neutron flux information during startup and heat-up operation. The IRMs generate trip signal to mitigate conditions that can result in local fuel damage. There are typically eight (8) IRM detectors in the BWR/3 - BWR/6 cores. | The IRM system provides neutron flux information during startup and heat-up operation. The IRMs generate trip signal to mitigate conditions that can result in local fuel damage. There are typically eight (8) IRM detectors in the BWR/3 -BWR/6 cores. Some BWR/4s have 6 IRMs.<br>Basis: 8 IRMs is the proper number for BWR/3 and BWR/6. The number of IRMs for BWR/4 is 6 | Comment incorporated. |
| 75 | Section 5.1.1.1 3rd & 4th sentences page 55 | Since there is no change in the maximum core power for the implementation of the MELLLA+ operating domain, the APRMs are not calibrated and are unaffected. Because the overlap occurs at lower power levels, the MELLLA+ expanded domain operation has no effect on the IRM overlap with the SRM and APRM. | Since there is no change in the maximum core power for the implementation of the MELLLA+ operating domain, the APRMs are not re-calibrated and are unaffected. ~~Because the overlap occurs at lower power levels~~ The MELLLA+ expanded domain operation has no effect on the IRM overlap with the SRM and APRM.<br>Basis: The overlap does not change because the power is not changed | Comment not incorporated. Section 5.1.1.1 of the LTR states "The MELLLA+ operating range expansion has no effect on the Intermediate Range Monitors (IRMs) overlap with the Source Range Monitors (SRMs) and APRMs, because overlap occurs at a lower power level than the MELLLA+ region." |
| 76 | Section 5.1.1.4 | The RCIS rod withdrawal limiter prevents excessive control rod withdrawal after reactor power has reached an appropriate level. | The RCIS rod withdrawal limiter prevents excessive control rod withdrawal after reactor power has reached an appropriate level. The region in which the RWM and RCIS are active is unaffected by MELLLA+ operation.<br>Basis: For clarification | Comment incorporated. |
| 77 | Section 5.1.1.5.2 Stability Setpoint Setdown | This reduction in detector response is due to a decrease in the moderation caused by the presence of high in-channel voids in the upper part of the fuel bundle and in the bypass | This reduction in detector response is due to a decrease in the moderation caused by the presence of high in-channel and bypass voids in the upper part of the fuel bundle ~~and in the bypass~~.<br>Basis: For clarification | Comment incorporated. |
| 78 | Section 5.1.1.5.3 Page 57 Steady State TIP Reading Above the LPRM D-Level | The LTR NEDC-33173P (Reference 2) limitation restricts the bypass voiding at the LPRM D-level to 5 percent during steady state operation. However, for operation at the high power/low-flow MELLLA+ 55 percent CF statepoint, the bypass voiding at the D-level can potentially be higher than the 5 percent specification limit. This has impact on both the thermal and gamma TIPs affecting the calibration of the LPRMs, and also on the core simulator axial power distribution adaption. | The LTR NEDC-33173P (Reference 2) limitation restricts the bypass voiding at the hot channel LPRM D-level to 5 percent during steady state operation. ~~However~~ If, for operation at the high power/low-flow MELLLA+ 55 percent CF statepoint, the bypass voiding at the D-level ~~can potentially be~~ is higher than the 5 percent specification limit~~. This has impact on both the thermal and gamma~~, then there could be an impact on the thermal ~~and gamma~~ TIPs affecting the calibration of the LPRMs, and also on the core simulator axial power distribution adaption.<br>Basis: Gamma TIPs are insensitive to bypass voids | Comment incorporated. |