RESOLUTION OF COMMENTS BY THE OFFICE OF NUCLEAR REACTOR REGULATION
ON DRAFT SAFETY EVALUATION FOR TOPICAL REPORT ANP-10297P-A, REVISION 0,
SUPPLEMENT 1, "THE ARCADIA REACTOR ANALYSIS SYSTEM FOR PWRs
METHODOLOGY DESCRIPTION AND BENCHMARKING RESULTS"

FRAMATOME, INC.

PROJECT NO. 728/DOCKET NO. 99902041

This attachment provides the U.S. Nuclear Regulatory Commission (NRC) staff's review and disposition of the comments made by Framatome Inc. (formerly AREVA Inc.) on the draft safety evaluation for Topical Report ANP-10297P-A, Revision 0, Supplement 1, "The ARCADIA Reactor Analysis System for PWRs Methodology Description and Benchmarking Results."

| Page | Line | Proposed Change/Comment | NRC Resolution of Proposed Change/Comment |
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| 1 | 37, 40 | Delete "coupled together" and "coupled." APOLLO2-A is not coupled with ARTEMIS™ in the typical usage of this term. APOLLO2-A generates cross section data files that are used by ARTEMIS™. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 1 | 38 | Replace COBRA-FLX with COBRA-FLX™. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 2 | 16, 17, 24 | Replace COBRA-FLX with COBRA-FLX™. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 2 | 22-23 | Delete "coupled together." APOLLO2-A is not coupled with ARTEMIS™ in the typical usage of this term. APOLLO2-A generates cross section data files that are used by ARTEMIS™. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 7 | 8-9 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 9 | 9 | Highlighted information is proprietary since it may reveal the specific interaction being described. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 9 | 28-29 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |

| Page | Line | Proposed Change/Comment | NRC Resolution of Proposed Change/Comment |
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| 11 | 3-4 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 12 | 23 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 13 | 11, 12, 14, 17, 25, 26, 42 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 14 | 18, 33 | [<br><br><br>] | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 15 | 1, 2 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 17 | 15 | Replace "The NRC does not currently review and approve applications to MOX fuels." with "The NRC did not review ARCADIA® for applications to MOX fuels." Framatome believes this statement is accurate and less confusing. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 18 | 1, 15 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 19 | 31 | Replace [          ] with [          ] to provide clarity. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 19 | 37, 38 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 21 | 15, 40 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |
| 25 | 1 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion.  Change implemented in final SE. |

| Page | Line | Proposed Change/Comment | NRC Resolution of Proposed Change/Comment |
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| 27 | 43 | Delete "in a stand-alone state" to avoid confusion and for consistency with Limitations and Conditions #5. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 28 | 46 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 29 | 6, 7 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 29 | 11-14 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 29 | 31-32, 46 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 30 | 4, 10 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 30 | 30 | Replace "five" with "five sets of." | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 31 | 7 | Replace "five" with "five sets of." | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 31 | 39, 40, 42, 43 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 32 | 15, 23, 24, 48, 49 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 33 | 16-17 | Replace "the NRC does not review and approve applications to MOX fuels." with "the NRC did not review ARCADIA® for applications to MOX fuels." Framatome believes this statement is accurate and less confusing. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 33 | 27, 28 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |

| Page | Line | Proposed Change/Comment | NRC Resolution of Proposed Change/Comment |
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| 35 | 12, 14 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 36 | 18, 21 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 37 | 11, 48 | Replace "ARCADIA®" with "ARTEMIS™." | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 38 | 40-41 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 39 | 39-40 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 41 | 15 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |
| 51 | Table 3.5 | Highlighted information is proprietary. Add proprietary brackets. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |

| Page | Line | Proposed Change/Comment | NRC Resolution of Proposed Change/Comment |
|------|------|--------------------------|--------------------------------------------|
| 53 | 35-36 | Framatome does not believe that a restriction on cycle length is appropriate. Shorter, or premature, cycle lengths are covered by the validation suite. The validation also included burnups approaching licensing limits so any cycle length that does not exceed licensed burnup limits is within the range of applicability. | NRC staff agrees. Lines 35-36 on page 53 have been updated to remove reference to a cycle length range.<br><br>The following text was added to clarify the intent of the original wording:<br><br>"Additionally, the ARCADIA® code system, as presented in Supplement 1, may be considered applicable for analyses up to 71 GWd/MTU rod average burnup. The range of burnup is based on the NRC staff's assessment of the capability of APOLLO2-A to predict nuclear data. However, this should not be interpreted as allowance to operate fuel beyond currently licensed burnup limits as explicitly stated (e.g., in the latest approved version of COPERNIC, Reference 17) and implicitly indicated throughout Framtome's licensing methodology." |
| 54 | 2-3 | Replace "continuous comparisons to measured plant data" with "comparisons to measured plant data as needed (e.g., application of ARCADIA® to a current cycle)" to avoid ambiguity on the interpretation of continuous comparisons. | NRC staff agrees. Lines 2-3 on page 54 have been updated with the following text:<br><br>"Additionally, Framatome will make comparisons to measured plant data as needed (e.g., application of ARCADIA® to a current cycle) to ensure there is no drift…" |

| Page | Line | Proposed Change/Comment | NRC Resolution of Proposed Change/Comment |
|------|------|-------------------------|-------------------------------------------|
| 54-57 | Section 3.9.3 | Framatome requests that this entire section be removed and replaced with NRC's latest evaluation of the code change process that requires submittal of changes for confirmation that the change is within the scope of the approved methodology. The current section as written, including the evaluation of different categories of changes, is incompatible with the latest draft evaluation. | NRC staff partially agrees. Lines 8-39 on page 54 that describe Framatome's proposed change process have been retained. Lines 40-41 on page 54 have been updated with the following text:<br><br>"…contain nuances that may not be consistent with the reviewed and approved methodology described in the TR and would therefore warrant further examination."<br><br>Line 43 on page 54 through line 23 on page 57 have been deleted and replaced with the latest NRC staff evaluation of the change process.<br><br>Line 25 on page 57 has been updated with the following text:<br><br>"Any changes must ensure…" |
| 58 | Item 4 | Replace COBRA-FLX with COBRA-FLX™. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |

| Page | Line | Proposed Change/Comment | NRC Resolution of Proposed Change/Comment |
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| 59 | Items 6, 7 | Replace the two limitations associated with the change process with a limitation that is consistent with NRC's latest draft evaluation of the code change process. | NRC staff agrees. Item 7 on page 59 has been deleted. Item 6 on page 59 has been updated with the following text: "<br><br>6. Any changes made to the ARCADIA® code system must:<br><br>   a. ensure the validation suite acceptance criteria (Table 10-2 of Supplement 1) remain applicable,<br><br>   b. be consistent with the methodology described in ANP-10297P, as supplemented, and<br><br>   c. not invalidate the NRC staff's SE.<br><br>In instances where it is unclear if a change is consistent with the approved methodology, Framatome may submit descriptions of a change to the NRC for confirmation that the change is within the scope of the approved methodology, as discussed in Section 3.9.3 of this SE. *(This is a new condition from this SE)*" |
| 60 | 1, 2 | Replace COBRA-FLX with COBRA-FLX™. | The NRC staff agrees with the editorial suggestion. Change implemented in final SE. |

| Page | Line | Proposed Change/Comment | NRC Resolution of Proposed Change/Comment |
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| 60 | 19-28 | Replace the two limitations associated with the change process with a limitation that is consistent with NRC's latest draft evaluation of the code change process. | NRC staff agrees. Limitation 7 on page 60 has been deleted. Limitation 6 on page 60 has been updated with the following text: "<br><br>6. Any changes made to the ARCADIA® code system must:<br><br>a. ensure the validation suite acceptance criteria (Table 10-2 of Supplement 1) remain applicable,<br><br>b. be consistent with the methodology described in ANP-10297P, as supplemented, and<br><br>c. not invalidate the NRC staff's SE.<br><br>In instances where it is unclear if a change is consistent with the approved methodology, Framatome may submit descriptions of a change to the NRC for confirmation that the change is within the scope of the approved methodology, as discussed in Section 3.9.3 of this SE. *(This is a new condition from this SE)*" |