AREVA

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Document Control Desk
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Clarification Regarding the NRC Safety Evaluation for ANP-10297P, Revision 0, "The ARCADIA® Reactor Analysis System for PWRs Methodology Description and Benchmarking Results"

Ref. 1: Letter, Sher Bahadur (NRC) to Pedro Salas (AREVA NP Inc.), " Final Safety Evaluation for AREVA NP Inc. Topical Report ANP-10297P, Revision 0, 'The ARCADIA® Reactor Analysis System for PWRs Methodology Description and Benchmarking Results' (TAC NO. ME3911)," February 13, 2013.

The attachment to this letter provides a clarification to a statement made in the Safety Evaluation for ANP-10297P, Revision 0, "The ARCADIA® Reactor Analysis System for PWRs Methodology Description and Benchmarking Results" transmitted in Reference 1. AREVA NP Inc. (AREVA NP) requests that the NRC provide written concurrence with the clarification. The NRC letter of concurrence will be included in the approved version of the topical report when it is issued. The attachment describes a change to the topical report to capture the clarification.

This letter contains two commitments. These commitments will be completed 60 days after receipt of the NRC letter concurring with the clarification.

1. The NRC letter concurring with the clarification will be included in the approved version of the topical report when it is issued.
2. The topical report will be revised as described in Attachment A to this letter and this will be included in the approved version of the topical report when it is issued.

If you have any questions related to this letter, please contact Ms. Gayle F. Elliott, Product Licensing Manager at 434-832-3347 or by e-mail at Gayle.Elliott@areva.com.

Sincerely,

Pedro Salas, Director
Regulatory Affairs
AREVA NP Inc.

cc: J. A. Golla
Project 728

T007
NRR

Enclosures:

Attachment A: "Clarification of Statement in Safety Evaluation for Topical Report ANP-10297P, Revision 0, 'The ARCADIA® Reactor Analysis System for PWRs Methodology Description and Benchmarking Results'"

Attachment A

Clarification of Statement in Safety Evaluation for Topical Report ANP-10297P, Revision 0, "The ARCADIA® Reactor Analysis System for PWRs Methodology Description and Benchmarking Results"

The following statement is made on page 28, in Section 3.0 Limitations and Conditions, of the Safety Evaluation for the topical report ANP-10297P, Revision 0, "The ARCADIA® Reactor Analysis System for PWRs Methodology Description and Benchmarking Results":

> *The ARCADIA® code system is limited to fuel types with non-Inconel grids unless additional verification of uncertainties is conducted to account for any peaking biases due to grid type or other plant effects. Verification of uncertainties must be quantified and accounted for in the uncertainties and/or peaking allowances in the licensing calculations on plant specific basis.*

AREVA NP Inc. (AREVA NP) has interpreted that this restriction is applicable only to grids made entirely of Inconel which are used in the central portion of the core. This restriction is believed to be related to the following statement on page 12-13 of the topical report.

> *Inconel grids cause significantly larger grid depressions and are no longer used; hence, these data are not included in the peak statistics.*

This Inconel grid exclusion in the statistics was solely for centrally located grids composed entirely of Inconel. Approximately 94% of the cycles included in the statistics have assemblies with some form of Inconel in the grids. The specific grid characteristics of the assemblies in each cycle are shown in Table 1 which also contains the statistics from Table 12.4.1-2 of the topical report. As shown in the table, there are Inconel grids in both the top and bottom of the fuel assembly represented in the data as well as zirconium alloy grids with Inconel springs labeled as Bi-metallic grids. Figure 1 illustrates the fraction of the data base with the different types of grids. The groupings of assembly grid designs in the cycles are defined as Inconel grids at the top or bottom with central Zircaloy grids, all Bi-Metallic grids, all Zircaloy grids, and cores containing different assembly grid designs with all Bi-Metallic grids and with some other grid type (details are in table). This figure clearly shows that the fuel with Inconel and Bi-metallic grids at the top and bottom of the fuel assembly and Bi-metallic grids in the central region of the fuel assembly make up a significant portion of the data used for the uncertainties. Since this data set is composed of both Inconel and Bi-metallic grids at the ends of the fuel assembly and Bi-metallic grids in the central region of the fuel, the verification of the uncertainties for these fuel assembly types is already contained in the topical report. Hence, AREVA NP interprets that the Inconel and Bi-metallic grids at the ends of the fuel assembly and the Bi-metallic grids in the central region of the fuel assembly can be classified as non-Inconel grids and no new submittal is required for these fuel types.

The statement on page 12-13 of the topical report is related to the NRC restriction and does not strictly define which locations of the Inconel grids affect the power depressions or the composition of an Inconel grid. AREVA NP proposes to revise this sentence upon issuance of the approved version of the report.

This statement will be revised to state:

Grids entirely composed of Inconel cause significantly larger grid power depressions in the central region of the core and are no longer used in these locations. Hence, specific statistics for cycles containing only Inconel grids in the central region of the core were not included in the peak statistics. Verification of uncertainties would be quantified and accounted for in the uncertainties and/or peaking allowances in the licensing calculations if an assembly were to be implemented with grids entirely made of Inconel in the central locations. Additionally, as indicated in Section 13.3, AREVA NP will verify that the peaking biases (due to grid type and/or other plant effects) are appropriate for all plants by evaluating at least 3 cycles of plant-specific data to confirm that any plant-specific biases are captured and meet the acceptance criteria specified in Table 13.2-1.

Table 1: Grid Type of Cycles Evaluated

Plant	Cycle	Central	Mid Span	Top	Bottom
S1	12	Zr		Inc_O	Inc_O
S1	13	Zr		Inc_O	Inc_O
S1	14	Zr		Inc_O	Inc_O
S2	12	Zr		Inc_O	Inc_O
S2	13	Zr		Inc_O	Inc_O
S2	14	Zr		Inc_O	Inc_O
A	11	Zr	Zr	BMG_O	BMG_A
A	12	Zr	Zr	BMG_O	BMG_A
A	13	Zr	Zr	BMG_O	BMG_A
A	14	Zr	Zr	BMG_O	BMG_A
T1	12	Zr		Inc_O	Inc_O
T1	13	Zr		Inc_O	Inc_O
T1	14	Zr		Inc_O	Inc_O
T1	15	Zr		Inc_O	Inc_O
C	14	BMG		BMG_O	BMG_A
C	15	63%BMG+37%Zr		same_O	same
C	16	32%BMG+68%Zr		same_O	same
C	17	Zr		Zr	Zr_PA
C	18	Zr		Zr	Zr_PA
G1	26	BMG		Inc_O	Inc_O
G1	27	BMG		Inc_O	Inc_O
G1	28	BMG		Inc_O	Inc_O
G1	29	BMG		Inc_O	Inc_O
G1	30	73%BMG+27%Zr		same_O	Inc_O
G2	3	34%Inc+66%BMG		Inc_O	Inc_O
G2	4	30%Inc+70%BMG		Inc_O	Inc_O
G2	5	11%Inc+89%BMG		81%Inc_O+19%BMG	81%Inc_O+19%BMG
V	18	BMG		BMG_O	BMG_A
V	19	BMG		BMG_O	BMG_A
V	20	BMG		BMG_O	BMG_A
V	21	BMG		BMG_O	BMG_A
V	22	BMG		BMG_O	BMG_A

BMG= Bi-Metallic Grid composed of a Zr alloy base grid with inconel springs. It contains between 6-18% Inconel.
Zr= Zirc based alloy grid
Inc =100% inconel alloy grid
_O = Outside active fuel column
_A= In active fuel column
_PA= Partially in active fuel column
% values indicates the fraction of the assemblies in the core with this type of grid.
Same= Same combination as the central region

Figure 1: Percentage of Cycles with Labeled Spacer Grid Type in Uncertainty Data Base