

# Attachment 2 - Change Table

## June 2017 Revision 6 to NPC SAR

Location	Description of Change
<b>Chapter 1</b>	
	The content of Chapter 1 was modified to reflect the authorized contents demonstrated in Chapter 6 to remain subcritical post HAC testing. The CSI for the NPC package remains unchanged.
Section 1.1	Added text to second paragraph to acknowledge the moderated neutrons are subsequently absorbed by cadmium layer surrounding the fuel region.
Section 1.2.3	Modified table with type, form, and maximum quantity of material per package to reflect the additional homogeneous uranium compounds evaluated in Chapter 6 in footnote 2 and to re-instate the previously approved BWR/PWR pellet maximum U loading per ICCA (kg U).
<b>Chapter 2</b>	
	The content of Chapter 2 contains no technical changes; header modified to reflect current SAR revision.
<b>Chapter 3</b>	
	The content of Chapter 3 contains no technical changes; only header modified to reflect current SAR revision.
<b>Chapter 4</b>	
	The content of Chapter 4 contains no technical changes; only header modified to reflect current SAR revision.
<b>Chapter 5</b>	
	The content of Chapter 5 contains no technical changes; only header modified to reflect current SAR revision.
<b>Chapter 6</b>	
	The content of Chapter 6 was modified to reflect the additional uranium compound permitted for transport in the NPC. The previously approved BWR/PWR pellet payloads are also re-instated.
Section 6.1, Table 6.1	Revised heterogenous UO <sub>2</sub> pellets (BWR/PWR) maximum loading per ICCA to reflect previously NRC-approved mass values. Prior foreign competent authority questions leading to reduction in pellet payload are no longer applicable. The current pellet payload safety demonstrations are valid and remain conservative.
Section 6.1, paragraphs 7,8,9	Updated material form description(s) to include additional uranium compounds evaluated in Appendix 6.11.
Section 6.1, Figure 6.0	Update figure to include previous and all newly evaluated solid uranium compounds. The reactivity behavior through optimal moderation is shown for the most reactive compound form.
Section 6.1,	Editorial update to include “material form” to continue theme of Section 6.1.

# Attachment 2 - Change Table

## June 2017 Revision 6 to NPC SAR

Location	Description of Change
paragraph 9	
Section 6.4	Updated to include SCALE6.1/KENO-VI code introduction and verified workstation description.
Section 6.4.1	Updated for minor grammar edits and include SCALE6.1/KENO-VI code package overview.
Section 6.4.2	Updated GEMER cross section treatment description/grammar; included SCALE6.1/KENO-VI cross section treatment used for material property (K-Infinite) studies.
Section 6.4.5	Updated to acknowledge KENO-VI sample input files are contained in Appendix 6.11.
Section 6.4.5	Revised to acknowledge Figures 6.10a-6.10d are for explicit NPC models; Figure 6.10e is representative of the K-Infinite material property studies.
Section 6.7	Updated to include new SCALE6.1 reference 10.
Appendix 6.11, paragraphs 1, 2	Revised to clarify the K-infinite comparisons for theoretical uranium compounds homogeneously mixed with water is bounded by theoretical $UO_2 + H_2O$ mixtures.
Appendix 6.11, Table 6.21	Revised to include expanded list of solid uranium compounds evaluated compared with theoretical $UO_2$ . Table includes compound molecular formula, density, molecular weight, and related reference.
Appendix 6.11, paragraphs 3,4,5	<p>Updated to include discussion of authorized uranium compounds and related K-infinite study comparison results:</p> <p>Figure 6.27 includes comparison of eight (8) calcium-uranium oxides previously evaluated (case sets f1-f8). NOTE: Only the most reactive calcium-uranium oxide form of the eight evaluated is included in summary Figure 6.0.</p> <p>Figure 6.28 includes comparison of updated set of uranium compounds (cases a-e, g-l).</p> <p>Results are summarized and new SCALE6.1/KENO-VI calculations are tabulated in Table 6.23. Results demonstrate theoretical uranium dioxide (<math>UO_2</math>) is bounding for other uranium compounds with percent uranium content (e.g., UFACT) less than theoretical <math>UO_2</math>. These results demonstrate other solid uranium forms with a UFACT less than theoretical <math>UO_2</math> are less reactive.</p> <p>Figure 6.29 includes representative sample input for SCALE/KENO-VI compound comparison K-infinite studies.</p>
<b>Chapter 7</b>	
	The content of Chapter 7 contains no technical changes; only header modified to reflect current SAR revision.
<b>Chapter 8</b>	
	The content of Chapter 8 contains no technical changes; only header modified to reflect current SAR revision.