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September 29, 2005

U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

Attn: Document Control Desk

Subject: Responses to Request for Additional Information on the NAC MAGNASTOR System Application

Docket No. 72-1031 (TAC No. L23764)

References:
1. MAGNASTOR System – Application for Approval, NAC International, August 31, 2004
2. Acknowledgment Review of the MAGNASTOR System Application, U.S. Nuclear Regulatory Commission (NRC), November 1, 2004
3. NRC/NAC Meeting on the MAGNASTOR System, November 1, 2004
4. Responses to Questions from November 1, 2004, NRC/NAC Meeting on the MAGNASTOR System, NAC International, January 31, 2005
5. Request for Additional Information for the Review of the NAC MAGNASTOR System Application, U.S. Nuclear Regulatory Commission (NRC), May 23, 2005
6. NRC/NAC Meeting on the MAGNASTOR System RAIs, June 8, 2005

NAC International, Inc. (NAC) herewith provides responses to the Request for Additional Information (Reference 5) for the Review of the NAC MAGNASTOR System Application (Reference 1) in which NAC requested approval of the MAGNASTOR System for the storage of spent nuclear fuel under the provisions of 10 CFR 72, Subpart L. This submittal includes four copies of the RAI comments with the NAC responses presented in the standard NAC RAI response format, four copies of the complete MAGNASTOR Safety Analysis Report (SAR), Revision 05A (all page headers), and one copy (on CD) of eight supporting NAC calculation packages and five fuel assembly description documents that are separately packaged as NAC Proprietary Information.

Consistent with NAC administrative practice, all SAR pages changed in this submittal are uniquely identified by revision bars in the page margin that mark each change on the page. A detailed list of the changes in the SAR is provided in Attachment 1. The list of effective pages has been replaced by a master table of contents to more clearly describe the contents of the SAR. Changes in the chapter table of contents, list of figures, list of tables, and in text flow are not marked with revision bars. Also, for editorial convenience: 1) figures or tables on pages listing computer run inputs/outputs do not have "continued" in the title; 2) where a new footnote is inserted, the remaining renumbered footnotes do not have revision bars; and 3) where a new operating step is inserted, the remaining renumbered steps do not have revision bars.

CDs Resubmitted by LTR dtd 11/15/05

ED20050065

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Note that the appendices in Chapters 3, 4, 5, and 6 of Revision 0 of the MAGNASTOR SAR have been incorporated into the associated chapter as a separate section (no revision bars applied) so that there is only one table of contents, one list of figures and one list of tables for each chapter. This revision enhances electronic navigability throughout the chapter. Upon final approval, the SAR will be reformatted, assigned the next appropriate revision number, and issued as the NAC MAGNASTOR FSAR.

Thirteen NAC drawings have been revised and one drawing has been added in conjunction with the RAI responses. These drawings and the two drawings that were not revised are all included in Chapter 1 of the SAR. A detailed list of the drawing changes is provided in Attachment 2.

Included in this submittal are eight NAC Calculation Packages and five fuel assembly description documents that are all separately packaged and identified as proprietary information. The calculation packages and fuel documents are provided on a CD to the NRC as NAC Proprietary Information. A detailed list of the eight calculation packages and five fuel assembly description documents is provided in Attachment 3. In accordance with 10 CFR 2.390, the supporting Proprietary Information Affidavit executed by Thomas A. Danner, NAC Vice President, Engineering, is enclosed.

The significant revisions incorporated in this MAGNASTOR SAR, Revision 05A, are the following:

- License drawings incorporate specific component details, i.e., tube pin/socket, etc.
- References to the MAGNASTOR Transport Cask are deleted.
- Peak average rod burnup revised to 62.5 GWd/MTU.
- Assembly average burnup revised to 60 GWd/MTU.
- Stress summary tables added for the TSC.
- Evaluations of fuel basket displacement and dynamic stability added.
- Fuel rod buckling evaluation added.
- Porous media flow resistance and thermal analyses revised.
- Benchmarking of annulus gap turbulent flow model provided.
- Use of the optional transfer cask annulus cooling system clarified.
- Evaluation of partial length BWR fuel rods provided.
- Helium backfill pressure/density requirements clarified.
- Canister closure revised to provide redundant sealing.
- Canister reflood analysis provided.
- Neutron absorber material qualification and acceptance testing defined.
- Canister hydo test added to acceptance criteria.

The MAGNASTOR System is currently being considered by several U.S. utilities for near-term implementation at their operating reactor sites. Therefore, NAC requests that the NRC continue the timely review and approval of the MAGNASTOR System application to support these anticipated utility needs. Any additional information requested will be promptly provided.

If you have any comments or questions, please contact me on my direct line at (678) 328-1274.

Sincerely,

Anthony L. Patko
Director, Licensing
Engineering

Enclosure - NAC Proprietary Information Affidavit

Attachments

1. List of SAR Changes in response to the MAGNASTOR RAI, September 2005
2. List of Drawing Changes for MAGNASTOR Amendment & RAI Responses, Revision 05A, September 2005
3. List of NAC MAGNASTOR Proprietary Information Calculation Packages and Fuel Assembly Description Documents, September 2005

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Attachment 1

List of SAR Changes

in Response to the

MAGNASTOR RAI

NAC International

September 2005

List of MAGNASTOR SAR Changes in Response to the MAGNASTOR RAI dated 5/23/05

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Chapter 1		
Section 1	1-7 1-7	Deleted 3rd paragraph on MAGNASTOR Transport Cask. Minor editorial changes in new 3rd and 5th paragraphs to refer to generic transport cask.
Section 1.1	1-7 2-3 Editorial 8-1 Editorial 8-1 1-7 1-7 7-3	Deleted reference to transport cask in Adapter Plate definition Added burnup definition Revised definition of Standoffs (Channels) Added Damaged Fuel definition. Added definition for Developed Cell (under Fuel Basket) and Revised Intact Fuel definition. Deleted Transport Cask definition. Deleted references to transport cask in Transfer Cask definition. Added definition of closure ring and also included closure ring in TSC definiton
Section 1.2	1-7 8-4 Editorial	Deleted reference to the MAGNASTOR Transport Cask in the first paragraph. SAR Section text has been revised to clarify the specific analyses addressing channel considerations 4th paragraph, 1st sentence – revised for clarity
Section 1.3	1-7	Deleted reference to the MAGNASTOR Transport Cask in the first paragraph.
Section 1.3.1	1-7	Deleted reference to the MAGNASTOR Transport Cask, i.e. the last paragraph.
Section 1.3.1.1 (pages 1.3-1 & 1.3-2)	Editorial 7-3	Added reference [3]; 3rd full paragraph, 10th sentence – changed "base plate" to "bottom plate" Added description of closure ring throughout
Section 1.3.1.2	Fab	Revised description of retention of neutron absorber and cover to address elimination of corner clips and weld post redesign
Section 1.3.1.3 (page 1.3-5)	5-1	1st & 3rd paragraphs revised for clarity
Section 1.3.1.4 (page 1.3-6)	1-7 1-7 4-6	Inserted "a" before transport cask in 1st paragraph. Deleted two references to transport cask in the second paragraph. 4th, 5th & 6th paragraphs – revised to address the use of a continuous annulus cooling system
Section 1.3.1.5	1-7	Deleted section on Transport Cask
Section 1.3.2	Editorial	Revised the sequence of TSC loading activities to coincide with revised Sections 9.1.1, 9.1.2 & 9.1.3
Figure 1.3-2	7-3	Added closure ring to Figure 1.3-2.

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Figure 1.3-4	1-7	Deleted figure of transport configuration of the Transport Cask.
Table 1.3-1	7-3 1-1	Added closure ring design characteristics to TSC components Corrected Fuel Basket Assembly diameter to 70.76
Table 1.3-3	Editorial	Revised wording under "Materials"
Table 1.3-4	Editorial	Revised concrete cask construction specifications
Section 1.5	Editorial	3rd paragraph – revised the statement of ownership of NAC 4th paragraph – revised the number of casks constructed by NAC
Section 1.7	Editorial	Reference 7 – changed "ACI 318" to "ACI 318-95"; deleted reference 20 & renumbered subsequent references
Drawing 71160-551	1-2 & Fab & Structural	Revised to add: (1) tube corner pin-to-socket connection details; and (2) boss/bolt assembly details Deleted corner clip retainers for neutron absorbers and added additional weld posts in revised pattern Increased length of tube attachment pins and associated cutouts
Drawing 71160-561	1-3, 1-4, 5-1 & Fab & Struct.	Added locations and dimensions for air inlets and outlets Revised to specify size of S-beams Added diameter of lifting holes Added detail of concrete cask lid
Drawing 71160-571	Fab & Structural	Added additional weld posts in revised pattern
Drawing 71160-572	Fab & Structural	Added additional weld posts in revised pattern
Drawing 71160-574	1-5 & Structural	Revised to specify hole diameter at the bosses Increased weld size between Item 1 and Items 2 and 3
Drawing 71160-575	1-2	Revised to add boss/bolt assembly details Revised mounting bolt material to be ASTM A193, Gr B6
Drawing 71160-581	7-3	Increased shell weldments lengths to incorporate the closure ring and associated welds
Drawing 71160-584	7-3	Added closure ring and associated graphics
Drawing 71160-585	7-3	Added details of closure ring and dual port covers and associated graphics
Drawing 71160-590	1-6 & 5-1	Revised to add design details for alternative segmented concrete cask
Drawing 71160-591	1-2 & Fab & Structural	Revised to add: (1) tube corner pin-to-socket connection details; and (2) boss/bolt assembly details Deleted corner clip retainers for neutron absorbers and added additional weld posts in revised pattern Added bottom plate and weld for fuel tubes
Drawing 71160-598	1-5 & Structural	Revised to specify hole diameter at the bosses Increased weld size between Item 1 and Items 2 and 3 Revised corner and side support weldment details Deleted Item 17, Note 7, and all associated graphics and weld callouts

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Drawing 71160-599	1-2	Revised to add boss/bolt assembly details Added washer and corner support weldment details Revised mounting bolt material to be ASTM A193, Gr B6
Drawing 71160-600	6-3	New drawing: Added to define the 82-Assembly BWR Basket Assembly with the cell-blocking components
Chapter 2		
Section 2	1-7	Deleted reference to MAGNASTOR Transport Cask
Table 2.1-1	2-1 Editorial	Added NUREG-0612 as a criteria for the Transfer Cask Concrete Temperature, Normal Conditions – changed "≤ 300°F (local)" to "≤ 200°F (local)"
Table 2.1-2 (Pages 2.1-3 & 2.1-4)	Editorial 7-3 7-2	Revised justification for Port Cover-to-Closure Lid Weld Added details to cover PT of closure ring. Added details on the new hydrostatic test requirements for the TSC following loading.
Section 2.2	Editorial	1st paragraph, 2nd sentence – changed "are grouped into" to "are assigned to"
Section 2.2.1	2-2	Section revised to clarify the design basis fuel parameters
Section 2.2.2	2-2	Section revised to clarify the design basis fuel parameters
Figure 2.2-1	2-2	Revised the title of Figure 2.2-1 to be more descriptive. Added zone descriptions for completeness
Tables 2.2-1 & 2.2-2	2-3	Limited maximum assembly average burnup to 60 GWd/MTU; added peak average rod burnup limit
Section 2.3.2.1	Editorial	2nd sentence – changed "float" to "move"
Section 2.3.2.3	Editorial	2nd paragraph, 1st sentence – revised throughout; 2nd sentence -- deleted
Table 2.3-3	Editorial	Added P_s structural design criteria for rows 1, 2, 3 & 4, as well as definition of symbol
Section 2.4.1	8-2	Revised last sentence (before bullets) in first paragraph to address fuel retrievability requirements. Added a definition of "retrievability" right after those bullets.
Section 2.4.2	8-2	Revised third paragraph to address fuel retrievability requirements.
Section 2.4.4	Editorial	Next-to-last sentence – changed "TFR" to "transfer cask"; last sentence – changed "inspection" to "maintenance"
Section 2.4.6.1	8-8	Revised first paragraph to include the effective ^{10}B loading for the BWR baskets and to clarify the assumed effectiveness for each type of neutron absorber. Deleted the second paragraph.
Section 2.4.7.3 (page 2.4-5)	Editorial	1st paragraph, 4th & 5th & 6th sentences – revised throughout to address TSC contamination issues

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 2.4.7.3 (page 2.4-6)	Editorial	2nd paragraph, 1st sentence – revised for clarity
Section 2.4.8	Editorial	Last sentence – changed "engulfing" to "occurring"; deleted former last sentence
Table 2.4-1	7-3	Added closure ring safety classification to TSC components
Section 2.5	8-2	Revised first sentence of third paragraph to address fuel retrievability requirements.
Section 2.6	Editorial 8-2	Inserted new Reference 9 Added ISG-2 as Reference No.24.
Chapter 3		
Section 3.1.1	7-3	Added closure ring to table
Section 3.1.2	7-3	Subset "TSC" – 1st paragraph, added next-to-last sentence to address closure ring
Section 3.1.3	Editorial	5th sentence – changed "TSC shell" to "fuel basket"
Section 3.4.2	7-3	Deleted old 6th sentence; "new" 6th sentence – changed "full penetration J-weld" to "J-groove weld"; added new 7th sentence; 9th & 10th sentences – revised throughout; 12th sentence – added "for the closure lid weld"
Section 3.4.3.2	3-1	Subset "TSC Lift Evaluation" – 1st paragraph table – revised throughout; last line of 1st paragraph – changed "2,198 psi" to "1,516 psi"; two following equations – revised throughout
Section 3.5.1	3-1	Added 2nd sentence
Section 3.5.1.5	3-1	2nd paragraph, 2nd sentence – changed "12 locations" to "15 locations" & deleted parenthetical information; 3rd paragraph, last sentence – changed "1.37 occurs at Section 11" to "1.23 occurs at Section 3"
Section 3.5.2.1 (page 3.5-6)	3-1 3-2	Subset "Normal Handling Evaluation" – 1st full paragraph, 1st sentence – added "P_t"; 2nd sentence – revised Figure number; rest of paragraph revised throughout, along with a revised sketch
Section 3.5.2.1 (pages 3.5-8 - 3.5-11)	3-1	Subset "Normal Handling Evaluation" – text & equations revised throughout
Section 3.5.2.1 (pages 3.5-11 - 3.5-14)	3-3	Subset "Thermal Stress Evaluation" – text & equations revised throughout

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 3.5.2.2 (pages 3.5-15 & 3.5-16)	3-1 3-2	Subset "Normal Handling Evaluation" – 2nd full paragraph, 1st sentence – added "P_t"; rest of paragraph revised throughout, along with a revised sketch
Section 3.5.2.2 (pages 3.5-17 - 3.5-20)	3-1	Subset "Normal Handling Evaluation" – text & equations revised throughout
Section 3.5.2.2 (pages 3.5-21 - 3.5-22)	3-3	Subset "Thermal Stress Evaluation" – text, table & equations revised throughout, including "Neutron Absorber Retainer Thermal Stress Evaluation"
Tables 3.5-1 – 3.5-4	3-3	Revised tables throughout
Section 3.6.1.2	3-1	Added last sentence
Section 3.6.1.2 (Page 3.6-2)	3-1	Subset "Off-Normal Internal Pressure with Normal Handling" – 1st partial sentence – changed "1.32 ($p_m + P_b$) occurs at Section 11 (center of bottom plate)" to "1.18 ($p_m + P_b$) occurs at Section 3" Subset "Off-Normal Handling with Normal Internal Pressure" – next to last sentence – changed "1.45 ($p_m + P_b$) occurs at Section 1 (bottom plate/shell)" to "1.27 ($p_m + P_b$) occurs at Section 3"
Section 3.6.2.1 (pages 3.6-3 & 3.6-5)	3-1	Revised text, table & equation
Section 3.6.2.2 (page 3.6-6)	3-1	1st full paragraph, table & equation -- revised throughout
Section 3.6.2.2 (pages 3.6-8 - 3.6-11)	3-1	Added new text & equations to address maximum bolt load & maximum shear load
Tables 3.6-1 – 3.6-3	3-1 3-3	Revised tables throughout
Section 3.7.1	3-1	Added 2nd sentence

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 3.7.1.1	3-1	2nd paragraph, 2nd sentence – changed "1.75 occurs at Section 11" to "1.59 occurs at Section 3"
Section 3.7.1.2.1	3-1	2nd paragraph, 2nd sentence – changed "3.61" to "3.71"
Section 3.7.1.2.2 (pages 3.7-2 & 3.7-3)	3-1	2nd paragraph, 2nd sentence – changed "9.2 ksi" to "9.3 ksi"; revised equation throughout
Section 3.7.1.3	3-1	1st paragraph – added new 2nd sentence 2nd paragraph, 2nd sentence – revised throughout
Section 3.7.2.1.1 (Page 3.7-5)	3-1	2nd full paragraph – deleted sketch
Section 3.7.2.1.1 (Pages 3.7-7 & 3.7-8)	3-1	Subset "PWR Neutron Absorber Evaluation" – revised throughout
Section 3.7.2.1.2 (Page 3.7-8)	3-5	Subset "PWR Fuel Tube Evaluation" – 1st paragraph, 2nd sentence – changed "40g" to "35g"; 2nd paragraph, 1st sentence – changed figure numbers & "tube ID" to "tube IDs" & deleted "and locations for stress evaluations"; 3rd paragraph, 2nd sentence – added reference "[8]"; 3rd sentence – added "primary"; 5th sentence – revised throughout
Section 3.7.2.1.2 (Page 3.7-9)	3-5	Subset "PWR Fuel Tube Evaluation" (cont'd) – 1st paragraph, 1st sentence – added "PWR"; 3rd sentence – changed 31.72 ksi respectively" to "31.1 ksi, respectively (0° basket orientation)"; changed equation following "Membrane plus bending"; next paragraph & equations – revised throughout
Section 3.7.2.1.2 (Page 3.7-10)	3-5	Subset "PWR Fuel Tube Evaluation" (cont'd) – revised throughout Subset "PWR Neutron Absorber and Retainer" – revised throughout
Section 3.7.2.1.2 (Page 3.7-11)	3-5	Subset "PWR Neutron Absorber and Retainer" (cont'd) – revised throughout
Section 3.7.2.1.2 (Page 3.7-12)	3-5 3-9	Subset "PWR Neutron Absorber and Retainer" (cont'd) – revised throughout Subset "PWR Corner Support Weldment Evaluation" – revised throughout
Section 3.7.2.1.2 (Page 3.7-13)	3-9	Subset "PWR Corner Support Weldment Evaluation" (cont'd) – revised throughout

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 3.7.2.1.2 (Page 3.7-14)	3-10 3-9	Subset "PWR Side Support Weldment Evaluation – corrected typographical error identified in RAI 3-10 Subset "PWR Side and Corner Weldment/Fuel Tube Attachment Evaluation" – revised throughout
Section 3.7.2.1.2 (Pages 3.7-15 – 3.7-17)	3-9	Subset "PWR Side and Corner Weldment/Fuel Tube Attachment Evaluation" (cont'd) – revised throughout
Section 3.7.2.1.2 (Page 3.7-18)	3-9	Subset "PWR Side and Corner Weldment/Fuel Tube Attachment Evaluation" (cont'd) – revised 2 equations Subset "PWR Fuel Basket Buckling Evaluation" – 1st paragraph, revised and combined with last 2 sentences of previous 4th paragraph (deleted previous 2nd & 3rd paragraphs)
Section 3.7.2.1.2 (Page 3.7-21)	3-11	Subset "PWR Fuel Basket Buckling Evaluation" (cont'd) –revised 2nd parameter used for buckling evaluation & following equations Subset "PWR Basket Displacement" – added new section
Section 3.7.2.1.2 (Page 3.7-22)	3-8	Subset "PWR Basket Displacement" (cont'd) – added new section
Section 3.7.2.2.1 (Page 3.7-23)	3-6	Subset "24-inch Concrete Cask End-Drop" – removed sketch titled " Common area of Fuel Tube and Connector Pin Intersection"
Section 3.7.2.2.1 (Page 3.7-25)	3-5	Subset "BWR Neutron Absorber Evaluation" –revised throughout
Section 3.7.2.2.2 (Page 3.7-26)	3-5	Subset "BWR Fuel Tube Evaluation" – revised throughout
Section 3.7.2.2.2 (Page 3.7-27)	3-5	Subset "BWR Fuel Tube Evaluation" (cont'd) – revised throughout
Section 3.7.2.2.2 (Page 3.7-28)	3-5	Subset "BWR Fuel Tube Evaluation" (cont'd) – revised throughout Subset "BWR Neutron Absorber and Retainer" – revised throughout
Section 3.7.2.2.2 (Page 3.7-29)	3-9	Subset "BWR Neutron Absorber and Retainer" (cont'd) – revised throughout Subset "BWR Corner Support Weldment Evaluation" – 1st paragraph, 1st sentence – added "plastic"; remainder of section revised throughout

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 3.7.2.2.2 (Page 3.7-30)	3-9	Subset "BWR Corner Support Weldment Evaluation" (cont'd) – revised throughout
Section 3.7.2.2.2 (Page 3.7-31)	3-9	Subset "BWR Side Support Weldment Evaluation" – revised throughout Subset "BWR Side and Corner Weldment/Fuel Tube Attachment Evaluation" – 1st paragraph, 2nd sentence – changed "16" to "eight"; 2nd paragraph – revised throughout; 3rd paragraph, 2nd sentence – changed "Grade B8" to "Grade B6" & revised equations throughout
Section 3.7.2.2.2 (Pages 3.7-32 – 3.7-36)	3-9	Subset "BWR Side and Corner Weldment/Fuel Tube Attachment Evaluation" (cont'd) – revised throughout
Section 3.7.2.2.2 (Page 3.7-37)	3-11 3-8	Subset "BWR Basket Buckling Evaluation" – 1st paragraph – revised throughout; deleted previous 2nd, 3rd & 4th paragraphs Revised 2nd parameter used for buckling evaluation & revised equations throughout
Section 3.7.2.2.2 (Page 3.7-38)	3-11 3-8	Subset "BWR Basket Buckling Evaluation" (cont'd) – 1st paragraph – revised 2 equations Subset "BWR Basket Displacement" – added new section
Figures 3.7-1 - 3.7-3	3-8	Inserted new figures Note: Other figures deleted & renumbered accordingly—i.e., old Figure 3.7-21 is now Figure 3.7-4.
Tables 3.7-1 - 3.7-3	3-1	Revised throughout
Tables 3.7-4 - 3.7-6	3-9	Revised throughout, along with footnotes
Tables 3.7-7 - 3.7-9	3-5 3-9	Revised throughout, along with footnotes
Table 3.7-10	3-9	Revised throughout, along with footnote; removed previous tables 3.7-7, 3.7-10 & 3.7.-13 & renumbered subsequent tables
Section 3.8 (pages 3.8-1 - 3.8-7)	3-12	Added new section & Figures 3.8-1 & 3.8-2 to address fuel rod buckling Note: New Section 3.8.3 replaces old Section 3.8.
Section 3.9	Editorial	Deleted year on reference 1; revised reference number 5; deleted reference 15 (was a duplicate of 5) & renumbered subsequent references; added references 24 – 28.
Section 3.10	Editorial	Added an introductory section
Section 3.10.1.1	3-13	1st paragraph, 11th sentence – added "; however, friction is not ... of the basket"

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 3.10.1.2 (Page 3.10.1-2)	3-1	Table revised throughout
Section 3.10.1.2.1 (Page 3.10.1-2)	3-1	Revised throughout
Section 3.10.1.2.1 (Page 3.10.1-3)	3-7	1st paragraph -- revised throughout
Section 3.10.1.2.2 (Page 3.10.1-3)	3-1	Added new section
Section 3.10.1.2.3 (Page 3.10.1-3)	3-1 3-8	Revised throughout
Section 3.10.1.2.3 (Page 3.10.1-4)	3-8	1st partial paragraph – revised throughout
Section 3.10.1.3.1	3-1	1st paragraph, last sentence – revised throughout; deleted next 2 sentences & equation
Section 3.10.1.3.2 (page 3.10.1-4)	3-3	Added new section
Section 3.10.1.3.2	3-3	Continuation of new section (text & table)
Section 3.10.1.3.3	3-1	1st paragraph, 3rd sentence – revised throughout; 4th sentence – changed "40g" to "35g"; last sentence – changed "40g" to "35g"; 2nd paragraph, 1st sentence – changed "0.87 inch" to "0.84 inch"; 2nd sentence – changed "40g" to "35g"
Section 3.10.1.4.1	3-1	2nd paragraph, last sentence – revised throughout; 3rd paragraph, 1st sentence – revised throughout; 4th paragraph, 1st sentence – revised throughout; added new 5th paragraph
Section 3.10.1.4.2	3-3	Added new last sentence
Section 3.10.1.4.3	3-1	Revised throughout
Figures 3.10.1-7 – 3.10.1-10	3-1 3-8	Added 4 new figures & renumbered subsequent figures (previous Figures 3.A-7 & 3.A-8 removed)
Figures 3.10.1-13 – 3.10.1-20	3-1	Added 8 new figures

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 3.10.2.1	3-13	1st paragraph, added last sentence
Section 3.10.2.2	3-1	Revised table throughout
Section 3.10.2.2.1 (page 3.10.2-2)	3-1	Revised throughout
Section 3.10.2.2.1 (page 3.10.2-3)	3-1	Revised throughout
Section 3.10.2.2.2	3-3	Added new section
Section 3.10.2.2.3	3-8	1st paragraph – revised throughout
Section 3.10.2.3.1 (page 3.10.2-4)	3-1	1st partial paragraph, 2nd sentence – added "bounding"; deleted next 2 sentences & equation
Section 3.10.2.3.2	3-3	Added new section (text, sketch & table)
Section 3.10.2.3.3	3-1	1st paragraph, 3rd sentence – revised throughout; 4th sentence – changed "40g" to "35g"; last sentence – changed "40g" to "35g" 2nd paragraph – revised throughout
Section 3.10.2.4.1 (page 3.10.2-5)	3-1	2nd paragraph, last sentence – revised throughout
Section 3.10.2.4.1 (page 3.10.2-6)	3-1	1st paragraph, 1st sentence – revised throughout 2nd paragraph, 1st sentence – revised throughout; added new last sentence
Section 3.10.2.4.2 (page 3.10.2-6)	3-3	Added new last sentence
Section 3.10.2.4.3	3-1	Revised throughout
Figures 3.10.2-5 & 3.10.2-6	3-1	Revised figures
Figures 3.10.2-7 – 3.10.2-10	3-1 3-8	Added 4 new figures & renumbered subsequent figures (previous Figures 3.B-7 & 3.B-8 removed)

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Figures 3.10.2-13 – 3.10.2-20	3-1	Added 8 new figures
Section 3.10.3	3-1	Subset "TSC Finite Element Model Description" – 1st paragraph, 5th sentence – added "standoffs or transfer cask inner shell"
Section 3.10.3	3-1	Subset "Boundary Conditions for Normal Conditions and Off-Normal or Accident Events" – "Inertial Load" – revised last line of table
Section 3.10.3	3-1	Subset "Boundary Conditions for Normal Conditions and Off-Normal or Accident Events" – "Pressure Load – Internal Pressure" – 2nd sentence – revised throughout; "Pressure Load – Dead Load, Handling and 24-inch Drop", 2nd sentence – changed "100,000 lb" to "90,000 lb"
Section 3.10.3 (page 3.10.3-3)	3-1	Subset "Boundary Conditions for Normal Conditions and Off-Normal or Accident Events" – " "Pressure Load – Dead Load, Handling and 24-inch Drop" – revised equation "Pressure Load – Off-Normal Handling" – added new section "Pressure Load – Tip-Over" – revised throughout
Section 3.10.3 (page 3.10.3-4)	3-1	Subset "Temperatures for Thermal Stress Analysis" – last line of listing – changed "168 inch" to "166 inches" and "520°F" to "510 °F"
Section 3.10.3	3-1	Subset "Post-Processing", 2nd sentence – changed "12 locations" to "15 locations"; last sentence – changed "Section 10" to "Section 11" Subset "TSC Analysis Result Details" – added new section
Figures 3.10.3-1 & 3.10.3-2	3-1	Revised throughout
Tables 3.10.3-1 - 3.10.3-17	3-1 3-4	Added new stress summary tables
Section 3.10.6 (pages 3.10.6-1 - 3.10.6-17)	3-11	Added new section, including 9 figures & 1 table, to evaluate basket stability for the concrete cask tip-over accident condition
Section 3.10.7 (pages 3.10.7-1 - 3.10.7-3)	3-8	Added new section, including 1 figure to evaluate the possibility of fuel tube deformation in case of a concrete cask tip-over accident
Chapter 4		
Section 4	Editorial	Changed reference from "NUREG-1536" to "NUREG-1567"
Section 4.1 (page 4.1-1)	Editorial 2-3	1st paragraph, 3rd sentence – added "structural protection" 2nd paragraph, 3rd sentence – revised throughout 3rd paragraph, 4th sentence – added "allowable" 5th paragraph, 1st sentence – changed "40 kW" to "37 kW"; 2nd sentence – changed "1.08 kW" to "1 kW"

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 4.1 (page 4.1-2)	Editorial	1st partial paragaph, last sentence – revised throughout 3rd paragraph, 4th sentence – deleted "For either fuel type"
Figure 4.1-1	Editorial	Revised 1st row, columns A, B & C, of table below figure
Table 4.1-2	Editorial	Changed reference for concrete from "NUREG-1536" to "NUREG-1567"
Section 4.3	Editorial	2nd paragraph, last line – changed "NUREG-1536" to "NUREG-1567"
Section 4.4.1 (page 4.4-3)	Editorial 4-4	1st partial paragraph, 1st complete sentence – revised throughout; 2nd sentence – revised throughout
Section 4.4.1.1 (pages 4.4-4 & 4.4-5)	4-5	Subset "Modeling of the Concrete Cask" – 2nd paragraph – revised throughout (replaces previous paragraphs 2 & 3)
Section 4.4.1.1 (page 4.4-8)	4-5	Subset "Modeling of the TSC" – 2nd full paragraph, last line before equation – added "used in FLUENT"; deleted old 5th line of equation explanation; added new 5th & 6th lines to equation explanation; revised following paragraph throughout
Section 4.4.1.1 (page 4.4-9)	4-5	Subset "Modeling of the TSC" (cont'd) – 1st partial paragraph, 1st line – added "resistance factors is neglected"; 1st full paragraph, 3rd sentence – added "These areas"
Section 4.4.1.1	2-3	Subset "Heat Generation" – 1st paragraph, 2nd sentence – changed "40 kW and 38 kW" to "37 kW and 35 kW"; 2nd paragraph, 2nd sentence – changed "40 kW or 1.08 kW" to "37 kW or 1.0 kW"; 4th sentence – changed "40 kW" to "37 kW"; 3rd paragraph, 2nd sentence – changed "38 kW" to "35 kW" & "437 Watts" to "402 Watts"; 5th sentence – changed "437 Watts" to "402 Watts"; 7th sentence – changed "437 Watts" to "402 Watts"
Section 4.4.1.1 (page 4.4-11)	7-2	Subset "Pressure of the Helium Backfill" – 2nd line – changed "lbm/in^3" to "lbm/ft^3 (0.760g/liter)"
Section 4.4.1.1 (page: 4.4-12)	Editorial	Subset "Mesh Sensitivity Evaluation" – 3rd paragraph, 7th sentence – added "which bounds the design basis condition for the 37 kW"
Section 4.4.1.1 (page 4.4-13)	4-4	Subset "Heat Transfer by Radiation" – 1st paragraph – added sentences 2-5 for clarity
Section 4.4.1.5	Editorial 4-6	2nd paragraph – revised throughout Deleted last paragraph

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 4.4.1.5 (pages 4.4-18 & 4.4-19)	Editorial 4-7	Subset "Evaluation of the Water Phase" – revised throughout
Section 4.4.1.5	Editorial 4-7	Subset "Evaluation of the Drying Phase – Pressurized Helium Drying System" – revised title & broke into two sections; this section revised throughout
Section 4.4.1.5 (pages 4.4-20 - 4.4-22)	Editorial 4-7	Subset "Evaluation of the Drying Phase – Vacuum Drying System" – added new section
Section 4.4.1.5	Editorial	Subset "Evaluation of the Helium Phase" – revised throughout
Section 4.4.1.5	Editorial	Subset "Evaluation of Moving the TSC into the Concrete Cask" – 2nd & 3rd sentences – revised throughout; last sentence – changed "movement and lid installation on the concrete cask" to "movement and placement in the concrete cask"
Section 4.4.3 (page 4.4-24)	Editorial	Subset "Normal Conditions of Storage" – 1st paragraph – added new last sentence; 3rd paragraph, last sentence – changed "266°F" to "262 °F"
Section 4.4.3 (page 4.4-24)	Editorial	Subset "Transfer Condition" – 1st paragraph, 5th & 6th sentences – revised throughout
Section 4.4.3 (page 4.4-25)	Editorial	Subset "Transfer Condition" (cont'd) – 1st partial paragraph, 4th full sentence – changed "48 hours" to "36 hours"; 5th sentence – changed "48 hours" to "36 hours" 2nd & 3rd paragraphs – replaced former paragraph with new text
Section 4.4.4 (page 4.4-27)	7-2	Subset "Maximum Internal Pressure for the TSC Containing PWR Fuel" – 1st full paragraph, 1st sentence – changed "477°F" to "464 °F"; added new 2nd thru 4th sentences; added new 4th paragraph to indicate origin of backfill pressure
Section 4.4.4 (page 4.4-28)	7-2	Subset "Maximum Internal Pressure for the TSC Containing PWR Fuel" (cont'd) – added new last paragraph to indicate origin of backfill pressure Subset "Maximum Internal Pressure for the TSC Containing BWR Fuel" – added new last paragraph to indicate origin of backfill pressure
Figure 4.4-3	Editorial 4-5	Deleted previous Figure 4.4-3, Reynold's Number ... Concrete Cask Annulus & renumbered all subsequent figures
Figure 4.4-5	Editorial 4-5	Revised figure throughout
Figure 4.4-14	Editorial 4-5	Revised figure throughout
Figure 4.4-15	Editorial 4-5	Revised figure throughout
Figure 4.4-16	Editorial 4-5	Added new figure
Figure 4.4-17	Editorial 4-5	Added new figure

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Tables 4.4-1 & 4.4-2	Editorial	Added footnote describing orientation of Kxx, Kyy, and Kzz.
Tables 4.4-3 & 4.4-4	Editorial 4-5	Revised throughout
Table 4.4-5	Editorial 4-5	Added new table
Section 4.5	Editorial	2nd paragraph, last sentence – changed "40 kW and 38 kW" to "37 kW and 35 kW"; 3rd paragraph – revised the following two tables throughout
Section 4.5	Editorial	Subset "Off-Normal Event TSC Internal Pressures" – 2nd sentence – revised throughout
Section 4.6.1	Editorial	Table following 2nd paragraph revised throughout
Section 4.6.2 (page 4.6-2)	Editorial	1st full paragraph, 1st sentence – changed "128-in-diameter" to "136-in-diameter"; 2nd paragraph – added new last sentence
Section 4.6.4 (pages 4.6-3 & 4.6-4)	7-2	Revised to indicate origin of backfill pressure. Provide tolerance allowed on backfill prior to reaching structural analysis inputs.
Section 4.7	Editorial	Revised reference number 20 & added reference numbers 21 & 22
Section 4.8	Editorial	Added section introduction
Section 4.8.2 (pages 4.8.2-1 – 4.8.2-3)	4-4	3rd paragraph – revised throughout Subset "Permeability (α) for the PWR Fuel Assembly" – revised title & section throughout Added new section – Subset "Permeability (α) for the BWR Fuel Assembly"
Figures 4.8.2-1 – 4.8.2-4	4-4	Added new figures
Section 4.8.3 (pages 4.8.3.1 – 4.8.3.9)	4-5	Added new section titled "Benchmark Evaluation of the Two-Dimensional Axisymmetric Methodology for Annular Cooling in the Concrete Cask for MAGNASTOR"
Figures 4.8.3-1 – 4.8.3-4	4-5	Added new figures

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Chapter 5		
All sections, including Tables in sections 5.2 & 5.8	2-3	Revised terms where needed from burnup to assembly average burnup
Sections 5.1.1 & 5.1.2 & Table 5.1-3	5-2	Added table containing maximum dose payload types. Added references to table in relevant SAR sections.
Section 5.1.1	5-2	Last paragraph, 1st sentence – revised throughout to reflect licensing dose rates.
Section 5.1.2	5-2	Last paragraph, 2nd & 3rd sentences – revised throughout to reflect licensing dose rates.
Table 5.1-1	5-2	Revised throughout to reflect licensing dose rates
Table 5.1-2	5-2	Revised throughout to reflect licensing dose rates
Section 5.2	5-5	Added SAS2H validation and use information.
Section 5.2.2	5-6	Clarified use of MCBEND spectrum in MCNP evaluation.
Section 5.5.1.2	5-1	Added text describing concrete cask model top section.
Figures 5.5-1 & 5.5-2	5-1	Added details to support RAI response
Sections 5.5.3, 5.8.3.5 & 5.8.4.5 & Figures 5.8.3-15 & 5.8.8-7	5-4 & 5-7	Added additional discussions on NAC-CASC method. Added breakdown of dose by source to PWR and BWR 2x10 cask array exposure plots. Specified that maximum dose rate payloads are used in the site boundary evaluations.
Figure 5.5-3	5-1	Added sketch of concrete cask model top section.
Figure 5.5-6	Editorial	Added note for clarity
Table 5.5-2	Editorial	Changed dimension for Lid Steel from "1.0-in. thick (over cask cavity)" to "1.0-in. total thickness"
Section 5.6.1.2	5-4 Editorial	Added description of code modifications and increased analysis method discussion. Changed wording from benchmark to validation. 6th paragraph, 1st sentence – changed "benchmarked" to "validated"
Section 5.6.3.1	5-2	2nd paragraph, 1st sentence – changed "785 mrem/hr" to "430 mrem/hr" to reflect licensing dose rates 3rd paragraph, last sentence – added for clarity

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 5.6.4 & Figure 5.6-8	5-8	Added "bounding" to the dose/exposure descriptions & figure title; added & changed references
Figures 5.6-1 thru 5.6-7	5-2	Revised throughout to reflect licensing dose rates
Section 5.7	Editorial	Added references 31 through 36
Section 5.8	Editorial	Added an introductory section
Section 5.8.3.2	5-2	1st paragraph, 2nd sentence – changed "40 kW per cask (1.081 kW per assembly)" to "37 kW per cask (1 kW per assembly)
Section 5.8.3.5	5-2	Added discussion of modeled concrete cask top and outlet dose rates vs. dose rates calculated with standard assembly concrete cask. Included statement on use of bounding heat load (40 kW PWR, 38 kW BWR) for skyshine analysis.
Figures 5.8.3-3 thru 5.8.3-13	5-2	Revised throughout to reflect licensing dose rates
Table 5.8.3-4	5-2	Revised table throughout
Section 5.8.4.2	5-2	1st paragraph, 2nd sentence – changed "38 kW per cask (0.437 kW per assembly)" to "35 kW per cask (0.402 kW per assembly) Deleted last line of table
Section 5.8.4.5	5-2	Included statement on use of bounding heat load (40 kW PWR, 38 kW BWR) for skyshine analysis.
Figures 5.8.4-3 thru 5.8.4-13	5-2	Revised throughout to reflect licensing dose rates
Figure 5.8.4-15	5-2	Revised dose rate tabulation below figure to reflect licensing dose rates
Table 5.8.4-5	5-2	Revised last 3 rows of table
Table 5.8.4-9	2-3	Added footnote "a" to table title & at bottom of page
Section 5.8.5.2.1	5-2	2nd paragraph, last sentence – changed "15×15" to "14×14"
Section 5.8.5.2.2	5-2	2nd paragraph, last sentence – changed "15×15" to "14×14"
Section 5.8.5.2.3	5-2	Revised table throughout
Figures 5.8.5-1 thru 5.8.5-4	5-2	Revised throughout to reflect licensing dose rates
Section 5.8.7	2-3	1st paragraph – changed "1.081 W" to "1 kw"; changed heat load column of following table; changed "40 kW" to "37 kW" in 1st sentence following table.

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 5.8.7.3	2-3	1st sentence – revised throughout
Table 5.8.7-1	2-3	Revised throughout
Section 5.8.8.4	5-4	Added section containing NAC-CASC input files
Figure 5.8.8-5 (pages 5.8.8-28, 5.8.8-30, 5.8.8-31 & 5.8.8-33)	5-3	Revised figure on pages noted
Figure 5.8.8-6 (pages 5.8.8-40, 5.8.8-41, 5.8.8-43 & 5.8.8-45)	5-3	Revised figure on pages noted
Chapter 6		
Section 6.1 (page 6.1-1)	Editorial 1-7 Editorial Editorial	1st paragraph, 9th sentence – revised throughout 1st paragraph, 10th sentence – deleted "or transport cask" 4th paragraph, 1st sentence – added "/developed cells" 4th paragrah, 5th sentence – added "specified on the License Drawings"
Section 6.1 (page 6.1-3)	Editorial	1st full paragraph, 2nd sentence – revised throughout
Table 6.1-2	6-18	Corrected column labeling error described in RAI 6-18.
Section 6.2	6-12	3rd paragraph – added to address BWR partial-length fuel rods
Tables 6.1-2, 6.2-2, 6.4-2, 6.7.6-6	6-12	Revised to indicate the number of partial length rods
Figure 6.2-1	6-12	Added to indicate the position of partial length rods
Section 6.3.2 (page 6.3-3)		Added last bullet
Figure 6.3-1	6-2	Updated per RAI 6-2 to indicate "interface width."
Table 6.3-1	6-1	Corrected data entry per RAI 6-1. Error in data entry for borated water composition.

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Sections 6.4.2.1, 6.7.3.1 & 6.7.6.1	6-2	Revised text to clarify "interface width" location.
Table 6.4-2 & 6.7.2-3	6-4, 6-6 & 6-7	Added 120 mil maximum channel thickness as a limit Justified no specification for pellet OD, rod pitch, & clad thickness
Table 6.4-2	6-18	Corrected column labeling error described in RAI 6-18.
Section 6.6	Editorial	Corrected reference #9
Section 6.7	Editorial	Added an introductory section
Section 6.7.1	6-4	3rd paragraph – new sentences 8, 9 & 10
Figure 6.7.1-1	Fab	Revised figure and note
Section 6.7.2 (Page 6.7.2-2)	Editorial	4th paragraph, 3rd sentence – added "wet unborated gap"
Table 6.7.2-3	6-6	Revised throughout
Sections 6.7.3.1 & Figures 6.7.3-1 & 6.7.3-2	6-8	Subset "Moderator Density Variations" – Revised Figure 6.7.3-1, added Figure 6.7.3-2 & augmented text to indicate pellet-to-clad condition for moderator density plots and justify use of maximum water density for bounding condition
Sections 6.7.3.1 & 6.7.6.1	6-8	Subset "Fabrication Tolerance" – Revised to indicate constant absorber areal density for fabrication tolerance cases (minimum absorber content per drawing/testing).
Section 6.7.3.2	6-15	Corrected typographical error described in RAI 6-15.
Sections 6.7.3.2 & 6.7.6.2	6-9	Revised text and tables to clarify conditions on which maximum reactivities reported are based.
Sections 6.7.3.3, 6.7.3.4, Figure 6.7.6-3; Tables 6.7.3-7, 6.7.3-8 & 6.7.3-9	6-5	Added section for PWR absorber removal, replacement and attachment modification (includes new figure & tables).
Tables 6.7.3-2 and 6.7.3-3	6-6	Replaced BW15H4 assembly with BW15H3 in sensitivity studies
Section 6.7.4	6-4	3rd paragraph – new sentences 5, 6, 7, 8 & 9

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Figure 6.7.4-1	6-9	Revised figure
Sections 6.7.5 & 6.7.6.1	6-11	Revised to indicate the use of the 87-assembly basket configuration for the majority of fuel and basket variation studies.
Section 6.7.6.1	6-16	Added 82-assembly moderator density curves. Modified existing curve to show flooded pellet to clad gap results.
Figures 6.7.6-1 & 6.7.6-2	6-4	Revised to show 87-assembly & 82-assembly basket BWR water density variations
Sections 6.7.6.3, 6.7.6.4, Figures 6.7.6-3 & 6.7.6-4; Tables 6.7.3-7, 6.7.3-8 & 6.7.3-9	6-5	Added section for BWR absorber removal, replacement and attachment modification (includes new figure & tables).
Tables 6.7.6-2, 6.7.6-3 & 6.7.6-4.	6-17	Added B9_76A data.
Table 6.7.6-5	6-13	Added table in response to RAI containing maximum reactivities versus USL
Table 6.7.6-6 (formerly 6.7.6-5)	6-18	Corrected column labeling error described in RAI 6-18.
Section 6.7.7	6-14	Augmented text justifying benchmark set.
Chapter 7		
Sections 7.1, 7.1.1, 7.1.2, 7.1.3 & 7.1.4	7-3	Revised discussion of confinement boundary closure to incorporate details of incorporation of the secondary confinement components (i.e., closure ring and outer (i.e., redundant) vent and drain port covers, welding, inspection, etc.
Section 7.1.1 (page 7.1-3)	Editorial	Last paragraph, 2nd sentence – added "qualified"; 3rd sentence – added ", or water,"
Figure 7.1-1	7-3	Updated TSC containment boundary figure to include closure ring and redundant port covers.

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 7.2.2	Editorial	2nd paragraph, 3rd sentence – changed "are held in place by stainless steel covers" to ", and the stainless steel covers are held in place by weld posts attached to the fuel tubes"; 4th sentence – deleted "metal matrix" 3rd paragraph, 1st sentence – changed "backfilled with helium" to "helium backfilled"; last sentence – changed "reached" to "generated"
Section 7.3	Editorial	1st paragraph, 1st sentence – changed "accident conditions of storage" to "accident events of storage"; 2nd sentence – changed "accident conditions of storage" to "accident events of storage"
Chapter 8		
Section 8.1	7-3 & Editorial	1st paragraph – deleted "TSC" from 1st two lines of components & fabrication materials; added Closure Ring to list of components & fabrication materials; deleted "/304L dual-certified" from Port Covers row Note below 1st paragraph – changed "SA182 Type 304/304L" to "SA182 Type F304" & changed "SA240 Type 304/304L" to "SA240 Type 304" 2nd paragraph – changed "Mounting Bolts and Washers" to "Mounting Bolts"; changed "Gr B8 stainless steel" to "Gr B6 stainless steel" for Mounting Bolt; added "Borated Aluminum Alloy, or Boral" to Neutron Absorber materials
Section 8.1.1	Editorial	1st paragraph, 2nd sentence – changed "Subsection NG, Article NG-2300" to "Subsection NB, Article NB-2311"; 2nd paragraph, 2nd sentence – changed "Subsection NG-2320" to "paragraph NG-2320"; 4th sentence – changed "Table NG-2331 (a)-1" to "Table NG-2331(a)(1)"
Table 8.3-1	8-13	Note following table, 1st sentence – revised throughout
Table 8.3-10	3-1	Revised table throughout & added footnote c
Table 8.3-12	3-1	1st row, 1st column – deleted reference to footnote e; last row, 1st column – deleted reference to footnote d
Table 8.3-14	8-12	Revised temperature header to, "Values at Temperature (°F)"; Revised footnote on Modulus of Elasticity value, 3.72, to be [b]; Revised units for Density to (lb/ft^3)
Table 8.3-16	8-12	Revised Temperature heading to include units, (°F); Removed " [e] " from Property heading; Revised Property list to Ultimate Tensile Strength and added footnote " [e] " ; Revised Property list to Yield Strength and added footnote " [e] "; Added footnote " [f] " to Elongation in 2 inches, %, Modulus of Elasticity, Coefficient of Thermal Expansion, Poisson's Ratio, and Density; Added footnote " [f] " to the listing of footnotes as: [f] ASME Boiler and Pressure Vessel Code, Section II, Part D[5]; Added two additional lines in the table: Boral Core Modulus of Elasticity, E (psi) = 1000 (assumed) for all temperatures; Boral Core Yield Strength, S_y (psi) = 10 (assumed) for all temperatures.
Table 8.3-22	Editorial	Replaced thermal conductivities table with PWR & BWR conductivities table
Table 8.3-26	8-6	Table 8.3-26 footnote for emissivity is changed from "c" to "b"

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 8.4	8-14 Editorial	Added two sentences at the end of the 2nd paragraph to specify the weld filler metals 4th paragraph – changed "Chapter 9" to "Chapter 10"
Section 8.5 (page 8.5-1)	Editorial	2nd paragraph, 1st sentence – changed "Gr B8" to "Gr B6"; 4th sentence – deleted "analyzed" Moved the last paragraph of this section (previously on page 8.5-2) to be the 3rd paragraph of this section (now on page 8.5-1) 4th paragraph, 1st sentence – deleted "wall" 5th paragraph – deleted previous 3rd & 4th sentences 6th paragraph – revised throughout
Section 8.5 (page 8.5-2)	Editorial	1st full paragraph – revised throughout 2nd paragraph – added new text 4th paragraph, last sentence – added "under the evaluated loading conditions"
Section 8.6	Editorial	1st sentence – added "exposed surfaces of" & made into 2 sentences by adding "The coatings are provided ..."
Section 8.6.1	Editorial	1st paragraph, 1st sentence – deleted "Both" 2nd paragraph – added last sentence
Section 8.6.2	1-7 Editorial	2nd paragraph, 2nd sentence – deleted "or transport cask"; 3rd sentence – deleted "for TSC transfer" 3rd paragraph, 2nd sentence – added "coating"
Section 8.7.1	Editorial	1st paragraph, 3rd sentence – added reference [33]
Section 8.8	8-8, 8-9, 8-10, 8-11	Section rewritten, including terminology definitions. Added Table 8.8-1, Neutron Absorber Material Minimum ^{10}B Loading, at the end of the section.
Section 8.9	Editorial	2nd paragraph, 1st sentence – added "/construction"
Section 8.10	Editorial	1st paragraph, last sentence – changed reference fro "NRC Bulletin 96-04" to "ISG-15"
Section 8.10.3	Editorial	4th & 5th sentences – revised throughout
Section 8.10.3.1 (page 8.10-6)	Editorial	3rd full paragraph, 1st sentence – deleted "under the closure lid"; last sentence – deleted "either" & added "argon" Last paragraph, 2nd sentence – changed "is attached to" to "accesses"; 3rd sentence – added "and TSC hydrostatic testing"
Section 8.10.3.2	Editorial	2nd paragraph, last sentence – revised throughout
Section 8.10.3.3	Editorial	1st sentence – changed "welding or cutting operations" to "closure lid welding or lid removal operations"
Section 8.11	8-1	Inserted definitions of intact fuel and damaged fuel at the beginning of the section
Section 8.11	8-1 & 8-2	Combined the first and second paragraphs and added a sentence addressing retrievability of the fuel and added a paragraph at the end of the section further addressing retrievability of the fuel.
Section 8.12	Editorial	Replaced reference number 10; added reference number 33

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 8.13.6 (pages 8.13-15 - 8.13-17)	Editorial	Replaced ASTM 29 with latest standard
Chapter 9		
Section 9.1	1-7, 7-2 & 9-2	Revised to correct TSC process description.
Sections 9.1.1, 9.1.2, & 9.1.3	4-6, 7-2, 7-3, 9-1, 9-2, 9-3	Corrected loading procedure to add new steps for helium mass determination for backfill, TSC hydro test, welding and NDE of secondary closure (confinement) components, turning vacuum pump off, new values for vacuum drying limits, procedures for corrective actions in case of loss of annulus cooling, etc. Details follow.
Section 9.1.1	Editorial 6-3 Editorial	Step 7 – 1st sentence – deleted "and"; 2nd sentence – added "over the transfer cask" Added second, independent, check of assembly to meet the requirements of the Technical Specifications into Step 15. Step 22 – added new last sentence Step 23, 1st sentence – added "radioactive" Step 25, Note: – added "or an equivalent structure" Step 29, 2nd sentence – changed (+25°F)" to (+25, -50 °F) Step 30 – revised throughout Steps 49, 50 & 51 – added new text & renumbered subsequent steps (e.g., new step 52 is the old step 49, etc.) Step 52 – revised throughout Step 56 – revised throughout Step 60 – deleted acronym (VDS); 60a. – spelled out vacuum drying system; 60b. – added 2nd sentence; 60c. – 1st sentence – added "and turn off the vacuum pump"; 2nd sentence – formerly part of 1st sentence; added 2 new Notes Step 61 – revised throughout Step 62 – deleted acronym (PHD); 62a. – spelled out pressurized helium drying Step 63 – revised throughout Step 64 – revised throughout Steps 67 & 68 – added new text & renumbered subsequent steps (e.g., new step 69 is the old step 64, etc.) Step 70, Note – revised throughout Step 74 – added new text
Section 9.1.2	Editorial	Step 16 – added new second Note
Section 9.1.3	Editorial	Clarified concrete cask spacing requirement in Step 16. Step 21 revised throughout.
Tables 9.1-3 & 9.1-4	4-6, 7-2, 7-3, 9-1, 9-2, 9-3	Added new tables
Section 9.2	1-7	1st paragraph, 2nd sentence – deleted "or a transport cask" Last paragraph – deleted 2nd sentence

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 9.3	Editorial 8-3 7-3 7-3	Step 5 – added "outer and inner" Step 14 – added bounding maximum flow rate Step 21 – revised throughout Step 22 – added new text & renumbered subsequent steps
Chapter 10		
Section 10.1.1 (page 10.1-2)	7-3	Fabrication control (h) – added 6th & 7th sentences to address PT examination of closure ring and redundant port covers
Section 10.1.2.2	Editorial	2nd paragraph, 1st sentence – added "be performed on the lugs independently of the concrete cask and will"
Section 10.1.2.3	9-2	Revised to add new section on Pressure Testing of the TSC
Section 10.1.3	Editorial	3rd paragraph, 2nd sentence – added "approximately"; added new 3rd sentence
Section 10.1.6 (pages 10.1-6 - 10.1-16)	8-9, 8-10, 8-11	Completely revised the section to incorporate the requirements of the new DRAFT ASTM standard for neutron absorbers.
Section 10.2.1 and Table 10.2-1	Editorial	Clarified requirements for inspection and repair of transfer cask coating
Section 10.3 (page 10.3-2)	Editorial	Added references 14 and 15.
Chapter 11		
Section 11.1.3	7-3 & Editorial	1st bullet, 1st sentence – deleted "used" & added "closure ring, and port covers"; 2nd bullet – added "and closure ring"
Section 11.3.2	Editorial	Added last sentence to identify the use of conservative heat loads
Tables 11.3-1, 11.3-2	5-7	Updated dose rates due to heat load reduction and exposures times for lid closure (closure ring, dual port covers).
Chapter 12		
Section 12	Editorial	2nd paragraph, 1st sentence – changed "rigorous" to "severe"
Section 12.1.1.2	Editorial	Deleted "a daily"
Section 12.1.1.3	Editorial	Changed "steady-state condition is" to "steady-state conditions are" 1st paragraph – revised table throughout
Section 12.1.2.2	Editorial	1st sentence – added "if measured"
Section 12.1.2.3	Editorial	2nd paragraph – revised table throughout

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 12.1.2.5 (Pages 12.1-3 & 12.1-4)	5-2	2nd, 4th & 5th sentences – revised to reflect licensing dose rates
Section 12.1.3.3 (page 12.1-5)	Editorial	1st full paragraph, last sentence – revised minimum factors of safety for the TSC and the fuel basket from "1.45 and 2.95" to "1.28 and 1.07"
Section 12.1.4.3 (page 12.1-6)	Editorial	1st partial paragraph – combined former 2nd paragraph with 1st paragraph & deleted 1st sentence from former 2nd paragraph; new 2nd paragraph, 1st sentence – added "the optional"
Section 12.1.5	Editorial	1st sentence – changed "steps" to "operations and measures" & added ", to the extent practical,"; 2nd sentence – added "or flat"
Section 12.1.5.2	Editorial	1st sentence – added "contamination"
Section 12.2	Editorial	2nd paragraph, 1st sentence – changed "classes" to "lengths" in 2 places
Section 12.2.1.3	2-3	1st paragraph, 3rd sentence – changed "246 psig (PWR) and 195 psig (BWR)" to "201 psig (PWR) and 158 psig (BWR)"; last sentence – revised minimum factor of safety for the TSC stresses from "1.75" to "1.59"
Section 12.2.4.3	Editorial	4th paragraph, last sentence – revised minimum margin of safety for the TSC stresses from "1.75" to "3.60"; 5th paragraph, last sentence – revised the factor of safety against buckling from "3.8" to "4.1"
Section 12.2.4.4	Editorial	Last sentence – revised throughout
Section 12.2.6	Editorial	1st sentence – added "storage"
Section 12.2.6.3	4-5 Editorial	1st paragraph, 6th sentence – changed "675°F." to "700 °F," 2nd paragraph, 1st sentence – added "safe"
Section 12.2.6.4	Editorial	2nd sentence – added "exterior surfaces of the" & "visually"; last sentence – revised throughout
Section 12.2.7.3	Editorial	1st paragraph – revised table throughout
Section 12.2.8.3	Editorial	Revised throughout
Section 12.2.9.3	Editorial	1st sentence – added "the array"; added new 3rd sentence
Section 12.2.10.3	Editorial	3rd sentence – revised throughout; last sentence – added "cask bulk"
Section 12.2.10.4	Editorial	Added "array of the concrete"
Section 12.2.11.4	Editorial	1st sentence – changed "concrete casks on" to "concrete cask array at"

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Section 12.2.11.5 (page 12.2-16)	5-3, 12-1	Added text addressing top missile impact on exposure and clarified bounding nature of radial dose evaluation.
Section 12.2.12	Editorial	2nd & 3rd paragraphs – revised throughout
Section 12.2.12.1	Editorial	2nd sentence – changed "are expected to result" to "will result"
Section 12.2.12.3 (page 12.1-17)	Editorial	2nd full paragraph, 2nd sentence – added "thicknesses"
Section 12.2.12.4 (pages 12.2-17 & 12.2-18)	12-2	Revised to include an evaluation for the radiological impact from a cask tip-over on the concrete pad
Section 12.2.12.5 (page 12.2-18)	Editorial	1st paragraph, 1st sentence – added "shielding or"
Section 12.2.12.5 (page 12.2-19)	Editorial	1st partial paragraph, 1st full sentence – added "at the earliest possible time" 2nd paragraph – changed "must be" to "should be"
Section 12.2.13	Editorial	2nd sentence – deleted "either"; changed "design basis limit" to "accident internal pressure limit"
Section 12.2.13.2 (pages 12.2-19 & 12.2-20)	Editorial	Added new 2nd sentence
Section 12.2.13.3	Editorial	4th sentence – added "thermal model"; 7th sentence – added "maximum"; last sentence – revised throughout
Section 12.2.13.4	Editorial	1st sentence – revised throughout
Section 12.2.13.5	Editorial	Revised throughout
Section 12.3	Editorial	Removed dates from references 2 & 3

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Chapter 13		
13A – Section 1.1	2-3 8-1, 13-2 1-7 Editorial	Added burnup definition Added definitions of Damaged Fuel and Intact Fuel Deleted "or to a TRANSPORT CASK" from definition of TRANSFER OPERATIONS Combined definitions of TRANSPORTABLE STORAGE CANISTER and TSC and revised for clarity
13A – Section 2.1	6-6, 13-4	Revised the referenced ("controlled") Chapter 6 tables to be 6.4-1 and 6.4-2.
13A – Section 2.2	6-6, 13-4	In two places, revised the referenced ("controlled") Chapter 6 tables to be 6.4-1 and 6.4-2.
13A – LCO 3.1.1, Cond. B	7-2	Changed "pressure" to "density" in 2 places
13A - SR 3.1.1.1	9-1	Revised to require vacuum pump be turned off during dryness verification.
13A - SR 3.1.1.2	7-2	Revised to incorporate additional instructions for backfilling the TSC with a specified mass of helium including adding a new Table 3-1 (see next item).
Table 3-1	13-1	Added new table to identify the required density of helium for a TSC containing design basis heat load contents. Deleted old Table 3-1.
13A – SR 3.2.1.1	13-3	Frequency revised to: Once within **4** hours .... AND Every **24** hours ....
13A – Section 4.1.1 a)	8-8	Replaced Item a) text with a tabulation of the minimum ^{10}B loading in the neutron absorber materials
13A – Section 4.2	Editorial	3rd paragraph – deleted "(1997)" and "(1995)"
13A – Section 4.4	Editorial	4th paragraph, 1st sentence – deleted "(1997)" and "(1995)"
13A – Section 5.1.2	Editorial	Deleted 2nd bullet (formerly b.), since the annulus cooling system is no longer a mandatory system. New 2nd bullet – added "and/or measurement" New 3rd bullet – revised throughout New 4th bullet – revised throughout New 5th bullet – revised throughout
13A – Section 5.1.3	Editorial	3rd sentence – changed "equipment operability and equipment lift height" to "equipment operability and lift heights"; 4th sentence – changed "if necessary" to "as necessary"
13A – Section 5.1.4	Editorial	2nd paragraph – added "the following"
13B	2-3	Revised terms where needed from burnup to assembly average burnup
13B – Section 1.0	Editorial	Third bullet revised to say, "Within **60** days, ...
13B – Section 2.0	13-4, 13-5	Revised sentence to include Tables 2-1 through 2-17 and Tables 6.4-1 and 6.4-2 of the FSAR

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
13B – Table 2-1	13-6, 13-7	Revised item I.A.1 to say, "Uranium PWR INTACT FUEL ASSEMBLIES listed in Tables 2-2 and 2-3 and meeting the following specifications:" Revised throughout to reflect assembly average burnup Revised item I.C, second sentence to say, "Assemblies may contain solid filler rods that displace a volume equal to, or greater than, that of the original fuel rod."
13B – Tables 2-2 & 2-9		Revised decay heat per assembly to reflect new heat load and burnup limits. Limited assembly average burnup to 60 GWd/MTU. Added peak rod burnup limit
13B – Table 2-3	13-5	Inserted second note, "Specific fuel characteristics are defined in Table 6.4-1 of the FSAR."
13B – Table 2-4	13-5	CEA column revised throughout; revised note
13B – Table 2-7	13-5	Maximum Heat Load column revised throughout
13B – Table 2-8	13-6	Inserted "I." before BWR FUEL (editorial) Revised item I.A.1 to say, "Uranium BWR INTACT FUEL ASSEMBLIES listed in Tables 2-9 and 2-10 and meeting the following specifications:" Revised throughout to reflect assembly average burnup
13B – Table 2-10	13-5	Inserted note, "Specific fuel characteristics are defined in Table 6.4-2 of the FSAR." Revised to indicate the number of partial length rods and refer to sketch of partial rod locations
13B – Table 2-11	Editorial	Inserted "2.3" that was inadvertently omitted previously
13B – Tables 2-13 – 2-17	2-3	Revised Tables 2-13, 2-14 & 2-15 to incorporate current PWR heat loads and burnup limits. Inserted Table 2-16 for current PWR heat load and moved previous BWR loading table to Table 2-17 for current BWR heat load and burnup limits
13C, Section 2.1	Editorial	Approved Contents, 3rd sentence – added "and nonfuel assembly hardware"
13C, Section 2.1	Editorial	Approved Content Limits and Violations, 2nd paragraph, 2nd sentence – changed "30 days" to "60 days"
13C, LCO 3.1.1	7-2, 9-1, 9-2, 13-1	Major revision to add information regarding turning off vacuum pump, hydrotesting the cavity and backfilling the TSC with a calculated mass of helium
13C, Section 3.2.1	Editorial	Backgound, 2nd paragraph – revised throughout; 3rd paragraph, 1st sentence – added "during the loading and TSC preparation up through the draining of the cavity water"
13C - SR 3.2.1.1 (pages 13C-19 – 13C-20)	13-3	Changed "eight" to "four" in five places. Revised 2nd sentence in 2nd paragraph to read, "...based on the potential for boron dilution to occur prior to the start of loading ..." Changed "48" to "24" in third paragraph. Added new last sentence to last paragraph
Chapter 14		
Figure 14.1-1	Editorial	Revised NAC Functional Organization Chart throughout
Section 14.2	Editorial	Revised references 1 & 3 for consistency
Throughout	Editorial	Miscellaneous minor editorial revisions for accuracy and consistency.

Chapter/ Section/ Figure/ Table	RAI Response No./ Editorial	Description of Change
Chapter 15		
Section 15	Editorial	1st paragraph, 2nd sentence – deleted "However"; changed "site" to "onsite"; 3rd sentence – added "direct" 2nd paragraph, 1st sentence – added "to the environment"
Section 15.1	Editorial	3rd paragraph, last sentence – changed "low specific activity material" to "Surface Contaminated Objects (SCO) or Low Specific Activity (LSA) material"
Section 15.2	8-2	Revised first sentence of the section to address fuel retrievability requirements.
Section 15.2	15-1 Editorial	Incorporated instructions for surveying for fuel particulates of TSC internals prior to disposal. 3rd paragraph, 2nd sentence – changed "low specific activity waste" to "SCO or LCA waste"
Table 15.2-1	Editorial	3rd row under header, 4th column – deleted "#N/A"
Section 15.3	2-1	Added ISG-2 as Reference No. 2. and 10 CFR 72 as Reference No. 3.

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Attachment 2

List of Drawing Changes

for

MAGNASTOR Amendment & RAI Responses Revision 05A

NAC International

September 2005

Drawing 71160-551, Revision 2 – Fuel Tube Assembly, MAGNASTOR – 37 PWR

- Revised Assemblies 99 and 98.
- Added new section views and details.
- Added new Item 12 to BOM – Name: Mounting Boss; Material: Carbon Steel; Spec: See Note 4; Description: Bar.
- Deleted Items 6 and 11 (corner clip) and updated accordingly throughout the drawing.
- Deleted Delta note 5 and removed all related delta graphics.
- Revised quantity for Item 7 (weld post) Assy 99: IS)144; WAS) 72; for Assy 98: IS) 136; WAS) 72.
- Revised cut-out length on Sheet 1, Zone E5, to accept pin: IS) (3.5) Typ; WAS) (2.2) Typ.

Drawing 71160-561, Revision 3 – Structure, Weldment, Concrete Cask, MAGNASTOR

- Changed dimension Sht 1 of 4, Zone D6: IS) (6.7 Typ); WAS) 6.70 Typ.
- Changed dimension Sht 1 of 4, Zone D6: IS) (4.5 Typ); WAS) 4.45 Typ.
- Changed dimension Sht 3 of 4, Zone D8: IS) (3x Ø.63) EQ. SPACED; WAS) 3x Ø.63, EQ. SPACED.
- Added dimensions to Assy -94 & -95 to show dia. of lifting hole (Ø4.1) and location from top radius (3.8).
- Changed BOM Item 14 description: IS) 3 x 7 1/2 S-BEAM; WAS) S-BEAM.
- Added Note 10.
- Added Item 39 to BOM – QTY for 93: A/R; Name: Concrete; Spec: Coml; Descrption: See Note 10.
- Revised Section D-D, Sheet 3, Zone B6.

Drawing 71160-571, Revision 2 – Details, Neutron Absorber, Retainer, MAGNASTOR – 37 PWR

- Revised Items 1, 2, 3 and 4 to enhance fabrication.

Drawing 71160-572, Revision 2 – Details, Neutron Absorber, Retainer, MAGNASTOR – 87 BWR

- Revised Items 1, 2, 3 and 4 to enhance fabrication.

Drawing 71160-574, Revision 2 – Basket Support Weldments, MAGNASTOR – 37 PWR

- Added Ø1.5 dimension for Items 2 and 3 on Sheet 1, Zone E7. Also added "(20.0) Typ" spacing of holes and updated graphics accordingly.
- Added Ø1.5 dimension for Items 8 and 9 on Sheet 2, Zone E4.
- Revised weld callout for Item 1 to Items 2 and 3, Sheet 1, Zone D6: IS) (1/4) groove weld, both sides, Typ, VT; WAS) 1/8 groove weld, both sides, Typ, VT.

Drawing 71160-575, Revision 2 – Basket Assembly, MAGNASTOR – 37 PWR

- Revised Item 18 (mounting bolt) description: IS) 5/8-11 UNC; WAS) blank.
- Added Detail D-D.
- Revised Item 18 (mounting bolt) Spec: IS) B6; WAS) B8.

Drawing 71160-581, Revision 2 – Shell Weldment, Canister, MAGNASTOR

- Revised length for Assemblies 99 and 97: IS) (191.8); WAS) (191.3).
- Revised length for Assemblies 98 and 96: IS) (184.8); WAS) (184.3).

Drawing 71160-584, Revision 2, Details, Canister, MAGNASTOR

- Added Item 5 to the BOM – Name: Closure Ring; Material: 304 St. Stl.; Spec: ASME SA 276; Description: Bar.
- Added graphics for Item 5 (closure ring).

Drawing 71160-585, Revision 2, TSC Assembly, MAGNASTOR

- Revised BOM.
- Added Delta note.
- Revised assembly callout on Sheet 2 to include Assemblies 95 and 94.
- Revised Detail A-A to include Item 16 (closure ring) and updated graphics of main TSC Assembly.
- Added Detail B-B showing stacked port covers and updated graphics of main TSC Assembly.
- Added balloon callout for Items 14 and 15 to balloon callouts 1, 2, 11 and 12.
- Added Assembly numbers 95 and 94 to the appropriate dimension on the overall dimension of the TSC Assemblies.
- Changed Delta note 4 to read, "PT final surface."

Drawing 71160-590, Revision 3, Loaded Concrete Cask, MAGNASTOR

- Updated to provide dimensions and locations of the air inlets and air outlets.

Drawing 71160-591, Revision 2, Fuel Tube Assembly, MAGNASTOR – 87 BWR

- Revised Assemblies 99 and 98.
- Added new section views and details.
- Deleted Items 3 and 4 (corner clip) and updated accordingly throughout the drawing.
- Deleted Delta note 5 and removed all related delta graphics.
- Revised quantity for Item 11 (weld post) Assy 99: IS) 84; WAS) 16; for Assy 98: IS) 80; WAS) 16.
- Added Item 12 to the BOM – Name: Bottom Plate; Material: Carbon Steel; Spec: ASTM A537, CL1; Description: Plate. Added detail for Item 12. Applied Item 12 balloon callouts accordingly throughout the drawing.
- Added a seal weld typical to the bottom of the Fuel Tube Assembly joining flush with Item 12 (bottom plate) Sheet 1, Zone E1. Showed cut view for clarity.
- Revised BOM to accommodate Assemblies 97 and 96.
- Added Assemblies 97 and 96 callout.

Drawing 71160-598, Revision 3, Basket Support Weldments, MAGNASTOR – 87 BWR

- Revised BOM.
- Added Delta note 6.
- Revised weld callouts for Assemblies 99 and 98 (corner support weldment).
- Added Assemblies 95 and 94 (corner support weldment – drain) and Assemblies 93 and 92 (corner support weldment – vent).
- Revised Assemblies 97 and 96 (side support weldment) overall width: IS) (17.4); WAS) (17.5).
- Revised Assemblies 99 and 98 (corner support weldment) overall width IS) (34.7); WAS) (34.8).
- Added hole callout for Assemblies 99 and 98 diameter is: (Ø1.6) Typ. Also added "(20.0) Typ" to hole spacing and updated graphics accordingly.
- Added hole callout for Assemblies 95 and 92 diameter is: (Ø 1.6) Ty
- Added hole callout for Assemblies 97 and 96 diameter is: (Ø 1.3) Typ. Also added "(20.0) Typ" to hole spacing and updated graphics accordingly.

Drawing 71160-599, Revision 2, Basket Assembly, MAGNASTOR – 87 BWR

- Revised BOM.
- Added notes for clarity.
- Revised Section B-B on Sheet 3 to show Corner Support Weldment – Drain.
- Updated View A-A on Sheet 2 to show new Corner Support Weldment – Vent and Drain.
- Added detail for Items 19 and 32.
- Revised Section B-B on Sheet 3 to show correct placement for Items 18 and 19 to Items 20 and 21, and the same for Items 31 and 32 to Items 22 and 23.
- Added Detail E-E.

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Attachment 3

List of

NAC MAGNASTOR PROPRIETARY INFORMATION CALCULATION PACKAGES AND FUEL ASSEMBLY DESCRIPTION DOCUMENTS

NAC International

September 2005

NAC INTERNATIONAL

List of NAC MAGNASTOR Proprietary Information Calculation Packages and Fuel Assembly Description Documents

- 71160-3025, "NewGen VCC/PWR Canister Thermal Evaluation with Increased Flow Resistance," Revision 0.
- 71160-3026, "NewGen VCC/BWR Canister Thermal Evaluation with Increased Flow Resistance," Revision 0.
- 71160-3027, "Determination of Flow Resistances for PWR and BWR Fuel Assemblies," Revision 0.
- 71160-3028, "Benchmark for the Turbulence Model for the Annulus Flow," Revision 0.
- 71160-5051, "NewGen Storage Cask Occupational Exposure Evaluation," Revision 1.
- 71160-5052, "NewGen Transfer Cask Occupational Exposure Evaluation," Revision 2.
- 71160-5061, "NewGen PWR Skyshine Analysis, " Revision 1.
- 71160-5062, "NewGen BWR Skyshine Analysis," Revision 1.
- "A Comparison of Skyshine Computational Methods," Hertel, Nolan E. et al, not for public release (accepted to be published in Radiation Protection Dosimetry, November 2005)
- EA790-4003, "PWR and BWR Enveloping Fuel Assembly Physical Descriptions, " Revision 1, NAC-UMS Calculation Package
- EA792-5001, "PWR and BWR Enveloping Fuel Assembly Descriptions for Nuclear Analysis," Revision 1, NAC-UMS Calculation Package
- Sub-array and Grid Information for the SVEA-96 Fuel Assembly Type, UMS Additional Information, Enclosure 9, Pages 48 and 49, submitted to the NRC on September 4, 1998
- "Fuel Assembly Data for Cask Designs," Report No. E00-19, Revision 0, Stoller Nuclear Fuel, October 16, 2000

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AFFIDAVIT PURSUANT TO 10 CFR 2.390

Thomas A. Danner (Affiant), Vice President, Engineering, of NAC International, hereinafter referred to as NAC, at 3930 East Jones Bridge Road, Norcross, Georgia 30092, being duly sworn, deposes and says that:

1. Affiant has reviewed the information described in Item 2 and is personally familiar with the trade secrets and privileged information contained therein, and is authorized to request its withholding.

2. The information to be withheld includes the following NAC calculation packages and fuel assembly description documents that are being provided in support of the technical review of NAC's request for approval of the NAC MAGNASTOR System.

   - 71160-3025, "NewGen VCC/PWR Canister Thermal Evaluation with Increased Flow Resistance," Revision 0.
   - 71160-3026, "NewGen VCC/BWR Canister Thermal Evaluation with Increased Flow Resistance," Revision 0.
   - 71160-3027, "Determination of Flow Resistances for PWR and BWR Fuel Assemblies," Revision 0.
   - 71160-3028, "Benchmark for the Turbulence Model for the Annulus Flow," Revision 0.
   - 71160-5051, "NewGen Storage Cask Occupational Exposure Evaluation," Revision 1.
   - 71160-5052, "NewGen Transfer Cask Occupational Exposure Evaluation," Revision 2.
   - 71160-5061, "NewGen PWR Skyshine Analysis, "Revision 1.
   - 71160-5062, "NewGen BWR Skyshine Analysis," Revision 1.
   - "A Comparison of Skyshine Computational Methods," Hertel, Nolan E. et al, not for public release (accepted to be published in Radiation Protection Dosimetry, November 2005)
   - EA790-4003, "PWR and BWR Enveloping Fuel Assembly Physical Descriptions, " Revision 1, NAC-UMS Calculation Package
   - EA792-5001, "PWR and BWR Enveloping Fuel Assembly Descriptions for Nuclear Analysis," Revision 1, NAC-UMS Calculation Package
   - Sub-array and Grid Information for the SVEA-96 Fuel Assembly Type, UMS Additional Information, Enclosure 9, Pages 48 and 49, submitted to the NRC on September 4, 1998
   - "Fuel Assembly Data for Cask Designs," Report No. E00-19, Revision 0, Stoller Nuclear Fuel, October 16, 2000

   The subject calculation packages and fuel assembly description documents include detailed analysis methods and results and fuel assembly data that have been developed or have been obtained under proprietary agreement by NAC and are being used for the NAC MAGNASTOR System.

   NAC is the owner of the information in the calculation packages. NAC has entered into agreements to maintain the fuel assembly description documents as proprietary information. The Radiation Protection Dosimetry paper is original presentation material not yet published- NAC is maintaining the authors' privacy rights. Thus, all of the above identified information is considered NAC Proprietary Information.

NAC INTERNATIONAL
AFFIDAVIT PURSUANT TO 10 CFR 2.390 (continued)

3. NAC makes this application for withholding of proprietary information based upon the exemption from disclosure set forth in: the Freedom of Information Act ("FOIA"); 5 USC Sec. 552(b)(4) and the Trade Secrets Act; 18 USC Sec. 1905; and NRC Regulations 10 CFR Part 9.17(a)(4), 2.390(a)(4), and 2.390(b)(1) for "trade secrets and commercial financial information obtained from a person, and privileged or confidential" (Exemption 4). The information for which exemption from disclosure is herein sought is all "confidential commercial information," and some portions may also qualify under the narrower definition of "trade secret," within the meanings assigned to those terms for purposes of FOIA Exemption 4.

4. Examples of categories of information that fit into the definition of proprietary information are:

   a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by competitors of NAC, without license from NAC, constitutes a competitive economic advantage over other companies.

   b. Information that, if used by a competitor, would reduce their expenditure of resources or improve their competitive position in the design, manufacture, shipment, installation, assurance of quality or licensing of a similar product.

   c. Information that reveals cost or price information, production capacities, budget levels or commercial strategies of NAC, its customers, or its suppliers.

   d. Information that reveals aspects of past, present or future NAC customer-funded development plans and programs of potential commercial value to NAC.

   e. Information that discloses patentable subject matter for which it may be desirable to obtain patent protection.

   The information that is sought to be withheld is considered to be proprietary for the reasons set forth in Items 4.a, 4.b, and 4d.

5. The information to be withheld is being transmitted to the NRC in confidence.

6. The information sought to be withheld, including that compiled from many sources, is of a sort customarily held in confidence by NAC, and is, in fact, so held. This information has, to the best of my knowledge and belief, consistently been held in confidence by NAC. No public disclosure has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements, which provide for maintenance of the information in confidence. Its initial designation as proprietary information and the subsequent steps taken to prevent its unauthorized disclosure are as set forth in Items 7 and 8 following.

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AFFIDAVIT PURSUANT TO 10 CFR 2.390 (continued)

7. Initial approval of proprietary treatment of a document/information is made by the Vice President, Engineering, the Project Manager, the Licensing Specialist, or the Director, Licensing – the persons most likely to know the value and sensitivity of the information in relation to industry knowledge. Access to proprietary documents within NAC is limited via "controlled distribution" to individuals on a "need to know" basis. The procedure for external release of NAC proprietary documents typically requires the approval of the Project Manager based on a review of the documents for technical content, competitive effect and accuracy of the proprietary designation. Disclosures of proprietary documents outside of NAC are limited to regulatory agencies, customers and potential customers and their agents, suppliers, licensees and contractors with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

8. NAC has invested a significant amount of time and money in the research, development, engineering and analytical costs to develop the information that is sought to be withheld as proprietary. This information is considered to be proprietary because it contains detailed descriptions of analytical approaches, methodologies, technical data and evaluation results not available elsewhere. The precise value of the expertise required to develop the proprietary information is difficult to quantify, but it is clearly substantial.

9. Public disclosure of the information to be withheld is likely to cause substantial harm to the competitive position of NAC, as the owner of the information, and reduce or eliminate the availability of profit-making opportunities. The proprietary information is part of NAC's comprehensive spent fuel storage and transport technology base, and its commercial value extends beyond the original development cost to include the development of the expertise to determine and apply the appropriate evaluation process. The value of this proprietary information and the competitive advantage that it provides to NAC would be lost if the information were disclosed to the public. Making such information available to other parties, including competitors, without their having to make similar investments of time, labor and money would provide competitors with an unfair advantage and deprive NAC of the opportunity to seek an adequate return on its large investment.

STATE OF GEORGIA, COUNTY OF GWINNETT

Mr. Thomas A. Danner, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated herein are true and correct to the best of his knowledge, information and belief.

Executed at Norcross, Georgia, this 29th day of September 2005.

Thomas A. Danner
Vice President, Engineering
NAC International

Subscribed and sworn before me this 29th day of September, 2005.

Notary Public