



January 19, 2007

ATTN: Document Control Desk
Director, Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Application for a Certificate of Compliance for the Mixed Oxide Fresh Fuel Package, Revision 4, Docket No. 71-9295

Packaging Technology, Inc (PacTec) in Tacoma, WA respectfully submits an amendment to the MOX Fresh Fuel Package (MFFP) (USA/9295/B(U)F-96) for review. Ten copies of Revision 4 of the MFFP Safety Analysis Report (SAR), Docket 71-9295, are provided. Both paper and electronic copies are provided.

The primary reason for the Amendment to the MFFP license is to add three new payloads to the MFFP. Each proposed payload is written up in a separate appendix. Each appendix follows the same format as the main body of the MFFP SAR while referring to the MFFP SAR for information common to both. Brief descriptions of the three appendices are stated below:

Appendix A: Payload addition of either undamaged or slightly damaged unirradiated MOX fuel rods in an Areva Rod Box-17 (ARB-17). Each ARB-17 may contain up to 17 individual undamaged or slightly damaged unirradiated MOX fuel rods.

Appendix B: Payload addition of up to 175 individual unirradiated MOX rods in one (1) AA433 rod container and one (1) Excess Material Assembly (EMA). The EMA is nearly identical to a standard MOX fuel assembly but does not meet the performance requirements of the approved MOX fuel assembly payload.

Appendix C: Payload addition of Los Alamos National Laboratory (LANL) Technical Area-18 (TA-18) unirradiated MOX rods. This payload addition consists of two types of MOX rods to be transferred in up to three (3) AA433 rod containers. TA-18 MOX rods have different physical and radiological characteristics than the currently approved MOX payload.

In addition, a number of corrections/clarifications were also made to the existing SAR. These changes include a revised projected package weight of 14,260 pounds. This 130 (1%) pound increase is necessary to compensate for the omission of an attachment channel for the Fuel Control Structure on the original weight calculation. Shock Indicators have also been added to the outside of the MFFP shell. A complete list of changes is provided in Attachment A. The listing of main MFFP SAR pages to be deleted/added is included in Attachment B. The contents of the electronic media are provided in Attachment C.

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For planning purposes, it would be helpful if the amended certificate could be granted by September, 2007. If you have any questions or comments regarding this submittal, please contact me at (253) 383-9000 x26, or at fred.yapuncich@areva.com.

Sincerely,



Fred Yapuncich, Project Manager
Packaging Technology, Inc

Enclosures: As Noted

cc: M. Rahimi, NRC/SFPO
J. Field
R. Clark, Shaw Areva MOX Services
P. Mann, LANL
R. Migliore

Project File 99008

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Attachment A Changes/Additions

Chapter 1 Changes

- Page 1.1-1. Added a discussion of the three new Appendices that address the three new contents.
- Page 1.1-2. Clarified the license type as Type B(U)F, as stated on the certificate, rather than simply Type B(U).
- Page 1.1-3, Figure 1.1-2 and Page 1.2-5. Changed cavity length from 165.25-in to 165.45-in.
- Page 1.2-1 and Page 1.2-4. Changed maximum weight to 14,260 lb.
- Page 1.2-1, Page 1.3-1, and Page 1.2-8, Figure 1.2-1. Changed approximate package length, which is a reference dimension, to 201.33-in.
- Page 1.2-1, Page 1.2-5. Changed body length from 171-1/4-in to 171.33-in to be consistent with the updated cavity length.
- Page 1.2-4. Changed the discussion on protrusions to indicate that the shock indicators are considered protrusions, as they are affixed to the shell.
- Page 1.2-6. Clarified that americium is reduced only to acceptable processing levels.
- Page 1.3-1. The tamper-indicating seal will be attached between holes drilled in two impact limiter bolt heads. SAR text changed accordingly.
- Page 1.4-1. Added the word “Packaging” to the section title.
- Page 1.4.2-1. Updated revision numbers of the drawings, as needed.

Drawing Changes

99008-10

- Changed approximate package length, which is a reference dimension, to 201.33-in, consistent with Section 1.2.1.
- Changed body length from 171-1/4-in to 171.33-in to be consistent with the updated cavity length.
- Changed distance between impact limiter lugs from 126-1/4-in (fractional) to 126.25-in (decimal) to be consistent with the decimal format of the other reference dimensions on this sheet.
- Changed tamper indicating device so that it is not shown attached to the impact limiter itself. The tamper indicating device will be attached between two bolts. Also, changed flag note 5 to be consistent with Section 1.3.2
- Changed weight of the package from 14,130 lb to 14,260 lb.
- Correct the view in Section A-A which showed a line extending past the side of the package.

99008-20

- Corrected Item 6 length from 3.0-in to 2.5-in.
- Corrected body length from 169.7-in to 169.95-in to be consistent with the Certification Test Unit (CTU).
- Changed cavity length from 165.25-in to 165.45-in for consistency with the new body length.

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- Changed body length from 171.3-in to 171.33-in for consistency with the cavity length of 165.45-in.
- Changed the depth callout on the ports from 1.8-in to .8-in so that these dimensions are measured from the arrowhead (clarification, no change to feature).
- Added shock indicators with brackets welded to the package shell as Items 29 through 31. Added flag note 23 to address the number and location of shock indicators.
- Added lid taper in Detail-L, which had been drawn incorrectly.
- Added “SCALE 1/8” to Assembly A1, Sheet 2 (editorial).
- Extended dimension lines on 28.50 diameter dimension to the inside of the bottom plate for clarity.
- Listed the trunnion insert (Item 9) as an “optional” part on Sheet 2. An insert typically would be used only if the threads became damaged and needed to be repaired.
- For the stiffener ring (Item 8), ASME SA276 is added as an option because this part will most likely be made from bar stock rather than plate.
- Added a flag note 24 for the doubler plates (Item 24) to allow these items to be made from two or more pieces jointed with full penetration welds. This change is necessary to aid fabrication.
- Added a general flag note 25 to allow orientation markings on the package body to assist in aligning the package with the skid and strongback.

99008-30

- Corrected Item 11 from 1/8-in thick to 7 gage (.179 in).
- Corrected the distance between strongback slots to properly mate with the clamp arms.
- In Section D-D, moved the arrow to clearly show the dimension defined by the FCS is 8.7-in.
- Deleted the lanyards from Sections D-D and E-E. The lanyards may cause the strongback to jam during strongback insertion into the package.
- Corrected Section D-D callout from “SHT 4” to “SHT 6” (editorial).
- Added flag note 8 concerning bolt torque to Items 17 and 18 on sheet 6 (editorial).
- Added note 14 to allow orientation markings to the strongback to facilitate proper orientation with the package body.

99008-32

- Note 7, corrected the torque from 12-15 lb-ft to 65-70 lb-ft to be consistent with CTU.
- Delete “(SHT 6)” from sheet 2 (editorial).

99008-33

- Corrected Item 15 length from 2-1/4-in to 2-1/2-in to be consistent with the CTU.
- Deleted extraneous period from Item 3, sheet 2 (editorial).

99008-34

- Deleted the numbers inside triangles, which indicated changes to previous revisions of these drawings and are no longer applicable (editorial).
- Slightly changed the location of the FCS lock pin hole to provide better mating to the

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FCS support.

- Added ASTM A276 as an option for Item 3 to increase flexibility for fabrication purposes.

99008-40

- Item 7, changed material from A276 to A240 to be consistent with Item 8, which is similar. (Note that this change is editorial, as Note 12 allows for several material types.)
- Item 10, corrected spelling of “recessed” (editorial).
- Items 29 and 30, changed “hole” to “recessed end” to be consistent with lid end impact limiter terminology (editorial).
- Item 38, added the number of impact limiter bolts (editorial).
- Items 3, 6, 7, 8, 9, 10, 12, 14, 26, 29, 31, 32, 33, 34, 35, and 36, added flag note 6 to be consistent with the fabrication techniques that will likely be used on the production units.
- Item 14, added flag notes 12 and 13 to be consistent with the other seam/joint angles.
- Added “6x” to Items 16 and 17 on sheet 2 (editorial).
- Corrected depiction of Item 42 backing bar on sheet 3 to be consistent with the depiction of the same item on sheet 2.
- For the bottom end impact limiter (sheet 3), changed the groove weld callouts from 3/32 / 3/32 to (3/32)/(3/32) to be consistent with the same weld callouts for the lid end impact limiter.

Chapter 2 Changes

- Page 2.1-3 through 2.1-5, Section 2.1.2.2.2. The number of shipments per year has been increased from 25 to 65 at the request of the client. Therefore, the fatigue assessment has been updated.
- Page 2.1-5. Changed “Certification Tests” to “Certification Test Results” (editorial).
- Page 2.1-6. Changed weight to 14,260 lb. Also updated package length from 201.25-in to 201.33-in.
- Page 2.1-8. Changed strongback weight to 3,030 lb, the empty package weight to 9,520 lb, and the total weight to 14,260 lb.
- Page 2.2-3. Added missing data to table, and made minor corrections to data and notes. No impact on calculations.
- Page 2.2-4. Added “ASTM A312” to material specifications, and made minor editorial changes to table.
- Page 2.4-2. Changed weight to 14,260 lb, and updated associated calculations.
- Page 2.6-2. The thermal expansion calculation has been updated to reflect the slightly longer package cavity and correct minor errors in the original calculation.
- Page 2.6-3. Typographical error corrected (1,086 to 1,089).
- Page 2.6-7 through 2.6-10. Minimum bolt torque changed from 180 lb-ft to 175 lb-ft to be consistent with the SAR drawings. Following calculations updated accordingly.
- Page 2.6-12. Weight changed to 14,260 lb and associated calculations updated.
- Page 2.6-15. Table heading changed from “psi” to “psia” for clarity.
- Page 2.7-4. Weight changed to 14,260 lb.
- Page 2.12.1-5. Update text to indicate why it is not necessary to rerun the SLAPDOWN

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calculations for an increased weight of 14,260 lb.

- Page 2.12.2-2. Text updated slightly to indicate that the mock payload simulates rather than bounds the weight the actual payload.
- Page 2.12.3-4. Corrected the text to state that the seal test and fill ports are 120 degrees apart, not 90 degrees.
- Page 2.12.3-4. Weight changed to 14,260 lb.
- Page 2.12.3-5. Text updated slightly to delete the statement that the 7,500 lb mock payload bounds the total payload weight.
- Page 2.12.5-21 and -22. Updated the strongback weight and the associated calculations.
- Page 2.12.5-24 and -25. Updated the strongback axial stress to account for the increased weight.
- Page 2.12.8-1 through 2.12.8-7. Weight changed to 14,260 lb and calculations updated as needed.

Chapter 3 Changes

- Page 3.1-1. Cavity length changed from 165.25-in to 165.45-in to be consistent with the updated SAR drawings.
- Page 3.2-6, Table 3.2-3. Erroneous thermal conductivity data, as well as the references, have been corrected. The actual thermal models use the correct values, consistent with the corrected table, and no results are impacted.
- Page 3.3-5. The margin of safety with respect to the maximum HAC pressure of 123.5-psig is +2.15, not +0.74. The +0.74 value from Section 2.7.4.3, *Stress Calculations*, is unrelated to the maximum HAC pressure.
- Page 3.4-3. The package cavity length is 165.45-in, based on the updated SAR drawings. A footnote has been added to note that the pressure calculation was performed using a slightly smaller dimension of 165.25-in, which is conservative.
- Page 3.5-1. Text erroneously indicated that the HAC thermal model used still air during the fire event. The thermal model used a fully engulfing fire (i.e., forced convection).

Chapter 6 Change

- Page 6.3-6, Table 6.3-1. This table lists the dimensions used in the MCNP models, which were based on preliminary SAR drawing dimensions. The values used in the MCNP models are compared against the current SAR drawings and any differences justified. No changes have been made to the MCNP models or results.

Chapter 7 Changes

- The strongback may be inserted and removed from the MFFP in either a vertical or horizontal orientation. In the original SAR submittal, only horizontal loading/unloading was addressed. Because the MFFP will also be used in a vertical orientation, the chapter is modified to address loading steps for vertical operations. A glossary of auxiliary equipment is also added to help clarify the operations.

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Attachment B
Delete/Insert Instructions
Revision 4 to MFFP Safety Analysis Report

SAR Section	Delete Pages from Rev. 3	Insert Pages to Rev. 4
Cover and Spine	Cover and spine	Cover and spine
Title page	Title page	Title page
Table of Contents	Table of Contents, pages i through x	Table of Contents, pages i through xxii
Chapter 1	1.1-1 through 1.2-8	Same page numbers
	1.3-1 through 1.4-2	Same page numbers
	1.4.2-1 through 1.4.2-2	Same page numbers
Chapter 1 Drawings	Drawing 99008-10, Rev. 2	Drawing 99008-10, Rev. 3
	Drawing 99008-20, Rev. 2	Drawing 99008-20, Rev. 3
	Drawing 99008-30, Rev. 3	Drawing 99008-30, Rev. 4
	Drawing 99008-31, Rev. 3 has not been revised (do not delete)	
	Drawing 99008-32, Rev. 0	Drawing 99008-32, Rev. 1
	Drawing 99008-33, Rev. 1	Drawing 99008-33, Rev. 2
	Drawing 99008-34, Rev. 3	Drawing 99008-34, Rev. 4
	Drawing 99008-40, Rev. 1	Drawing 99008-40, Rev. 2
Chapter 2	2.1-1 through 2.1-8	Same page numbers
	2.2-3 through 2.2-4	Same page numbers
	2.4-1 through 2.4-4	Same page numbers
	2.6-1 through 2.7-4	Same page numbers
	2.12.1-3 through 2.12.1-6	Same page numbers
	2.12.2-1 through 2.12.2-4	Same page numbers
	2.12.3-3 through 2.12.3-6	Same page numbers
	2.12.5-21 through 2.12.5-26	Same page numbers
	2.12.8-1 through 2.12.8-10	Same page numbers
Chapter 3	3.1-1 through 3.1-2	Same page numbers
	3.2-5 through 3.2-6	Same page numbers
	3.3-5 through 3.3-6	Same page numbers
	3.4-3 through 3.4-4	Same page numbers
	3.5-1 through 3.5-2	Same page numbers
Chapter 6	6.3-5 through 6.3-8	Same page numbers
Chapter 7	7.1-1 through 7.2-4	7.1-1 through 7.2-8

The three Appendices are new and are in their own separate binder (Vol. 2.).

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Attachment C
Contents of Electronic Media

This submission is composed of both paper copies and electronic copies. The electronic copies are contained within an envelope labeled, "MFFP Docket 71-9295 Electronic Copy of Documents." The envelope contains ten compact discs of the following:

Title	Media Type	Contents
MOX Fresh Fuel Package Safety Analysis Report	CD-ROM	One file of the complete text of the submittal, including all replacement pages and new Appendices: MFFP Safety Analysis Report, Rev 4.PDF