Westinghouse Electric Company
Nuclear Fuel
Columbia Fuel Site
P.O. Drawer R
Columbia, South Carolina 29250
USA

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

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Our ref: UAM-NRC-06-009
Your Ref:

Attention: Document Control Desk

May 13, 2006

Subject: CERTIFICATE OF COMPLIANCE NO. 9292 FOR THE MODEL NO. PATRIOT PACKAGE

Attached please find our application to approve modifications to the design of the Patriot package, previously approved by NRC, USA/9292/AF-85, as allowed by 10 CFR 71.19 (d)(2). The modifications are not significant, with respect to the prevention of criticality, when the package is subjected to the tests specified in §71.71 and §71.73.

Approval of these changes is requested to support a shippment using the Patriot package that is scheduled for September 2006.

Please direct any questions to the me at (803) 647-3552.

Sincerely,

Norman A. Kent
Manager Transport Licensing and Regulatory Compliance
Uranium Asset Management
WESTINGHOUSE ELECTRIC COMPANY, LLC

Enclosures

Description and Justification of Proposed Changes
Proposed wording for Certificate of Compliance USA/9292/AF
Pages affected in License Application USA/9292/AF
Previous Versions of Certificate of Compliance USA/9292/AF including NRC SER

UAM-NRC-06-009 Patriot.doc

By Federal Express

Enclosure 1: Description and Justification of Proposed Changes

This amendment request provides the revised package drawings that show all package configurations or modifications made during refurbishment activities that were approved in Revision 4 to the Patriot CoC, requests approval of changes to improve operation of the package, and proposes a change to the description of contents in the CoC. None of the changes to improve the operation of the package are significant with respect to the prevention of criticality. A detailed of changes to the license drawings is provided in Enclosure 3.

Packaging Configurations authorized by CoC 9292, Revision Number 4

Revision 4 to the Patriot CoC authorized packaging configurations shown in Figure 8-1, 8-7, and 8-9 of supplement dated January 6, 2006. Revised package drawings are provided in this supplement that show all package configurations or modifications made during refurbishment activities. The packaging configurations shown in Chapter 8 of the application are retained to provide detailed guidance for maintenance activities and ensure compliance with the configurations shown on the package drawings. Reference Figure 8-1, 8-7, and 8-9 in paragraph 5.(a)(3) Drawings of the CoC should be removed.

Additional packaging configuration modification

Following the completion of the first use of the refurbished Patriot packages, one additional modification to the packaging to improve the operation of the package was identified. This modification consists of adding a screen barrier to the inner container lid to keep foreign material from the fuel assembly. Also, general notes were added to describe allowed packaging configurations.

Figure 1 shows the drawing detail for the screen barrier which is to be installed on the inner container lid. The fiberglass screen material does not restrict free flow of water flow through holes in the lid. Note that this packaging configuration has been previously approved by the NRC for the RA-3, package Identification number USA/4986/AF.

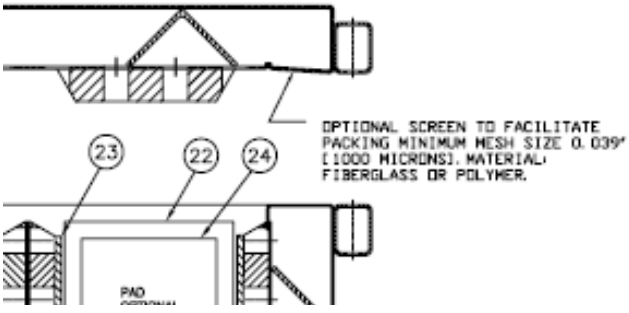


Figure 1 – Optional inner container lid screen

Modification to description of contents

In addition to the previously approved and additional packaging modifications requested by this supplement, a change to description of the contents in Paragraph 5.(b) (ii) of the Certificate of Compliance is requested to clarify the actual configuration of partial length fuel rods.

The description of assembly type #2 in Revision 4 of the CoC states that:

"The eight two thirds length fuel rods, arranged as two rods in each quadrant of the assembly, are located on the geometric diagonal toward the center of the assembly."

This statement may be misleading, since the two-third length rods are actually located symmetric to the geometric diagonal, not on the geometric diagonal. The description should read as follows:

"The eight two-thirds length fuel rods, arranged as two rods in each quadrant of the assembly, are located symmetric to the geometric diagonal of the assembly."

Enclosure 2: Proposed wording for Certificate of Compliance USA/9292/AF

Revision Number 4

5.(a)(3) Drawings

The packaging is constructed and assembled in accordance with Westinghouse Electric Company, LLC Drawing Nos.:

1001 4E27, Rev. 1,
10014E28, Sheets 1 and 2, Rev. 1,
10015E58, Sheets 1 and 2, Rev. 1,
Packaging configurations show 8-9 of supplement dated January 6,2006, are authorized.

Revision Number 5

5.(a)(3) Drawings

The packaging is constructed and assembled in accordance with Westinghouse Electric Company, LLC Drawing Nos.:

1001 4E27, Rev. 1,
10014E28, Sheets 1 and 2, Rev. 2,
10015E58, Sheets 1 and 2, Rev. 2

Revision Number 4

5.(b) Contents

(ii) Description of Assembly Type #2

Each assembly is made up of 96 fuel rods having a maximum active fuel length of 150 inches. Each assembly contains four one-third length fuel rods and eight two-thirds length fuel rods. The four one-third length fuel rods are located on the outside corners of the assembly. The eight two-thirds length fuel rods, arranged as two rods, in each quadrant of the assembly, are located on the geometric diagonal toward the center of the assembly. The fuel pellet diameter is 0.848 cm nominal, encapsulated in 0.061 cm nominal zirconium alloy cladding. There is a 0.0075 cm gap between the pellets and the cladding. The maximum U-235 enrichment of any fuel rod is 5.0 weight percent. Each assembly contains water holes in the four center rod positions of the assembly. The fuel assembly must be transported in channels. The specifications for each one-third length axial section of the fuel assembly are as follows:

Revision Number 5

5.(b) Contents

(ii) Description of Assembly Type #2

Each assembly is made up of 96 fuel rods having a maximum active fuel length of 150 inches. Each assembly contains four one-third length fuel rods and eight two-thirds length fuel rods. The four one-third length fuel rods are located on the outside corners of the assembly. The eight two-thirds length fuel rods, arranged as two rods in each quadrant of the assembly, are located symmetric to the geometric diagonal of the assembly. The fuel pellet diameter is 0.848 cm nominal, encapsulated in 0.061 cm nominal zirconium alloy cladding. There is a 0.0075 cm gap between the pellets and the cladding. The maximum U-235 enrichment of any fuel rod is 5.0 weight percent. Each assembly contains water holes in the four center rod positions of the assembly. The fuel assembly must be transported in channels. The specifications for each one-third length axial section of the fuel assembly are as follows:

Enclosure 3: Pages affected in License Application USA/9292/AF

Replacement Pages for Application

REMOVE	ADD
i	i
Dwg No 10014E28 Rev. 01, Sheet 1 of 2	Dwg No 10014E28 Rev. 02, Sheet 1 of 2
Dwg No 10014E28 Rev. 01, Sheet 2 of 2	Dwg No 10014E28 Rev. 02, Sheet 2 of 2
Dwg No 10014E58 Rev. 01, Sheet 1 of 2	Dwg No 10014E58 Rev. 02, Sheet 1 of 2
Dwg No 10014E58 Rev. 01, Sheet 2 of 2	Dwg No 10014E58 Rev. 02, Sheet 2 of 2

Summary of Changes to Drawings

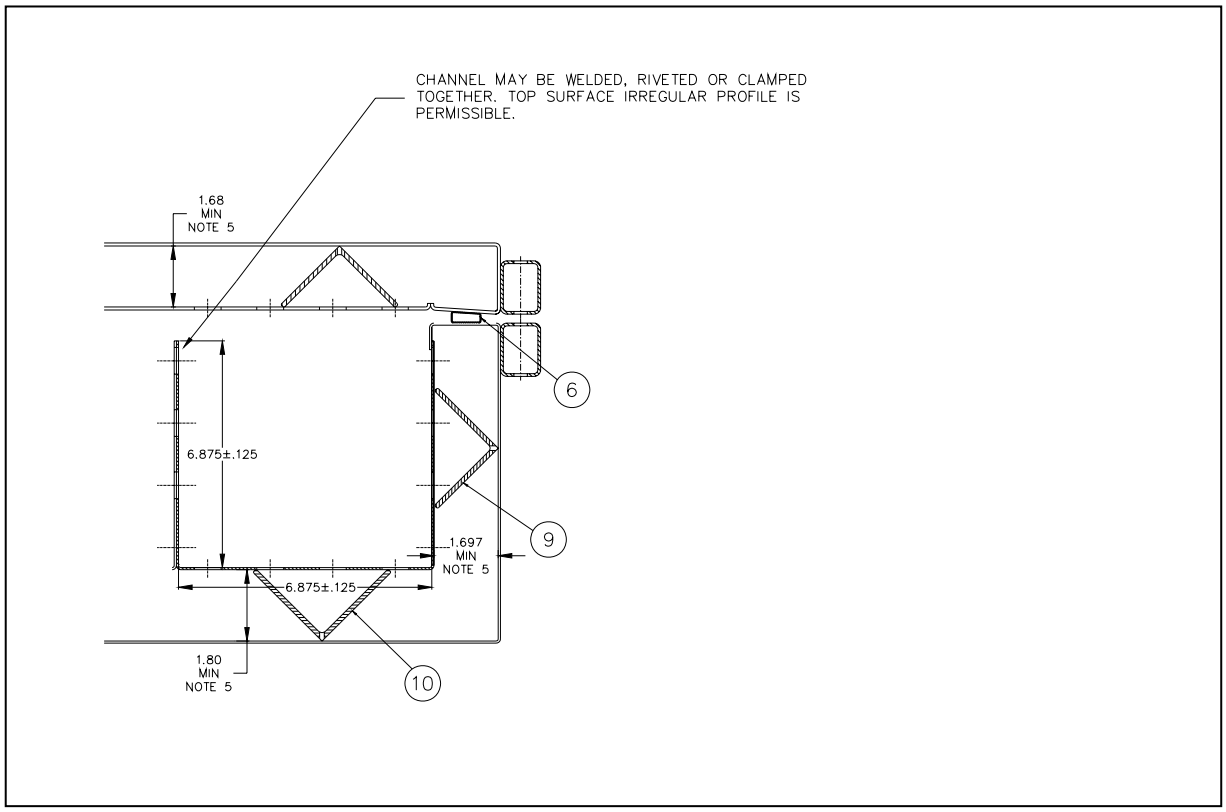
10014E28 Rev. 1, "Patriot BWR Inner Shipping Package and Safety Items"

SHEET 1

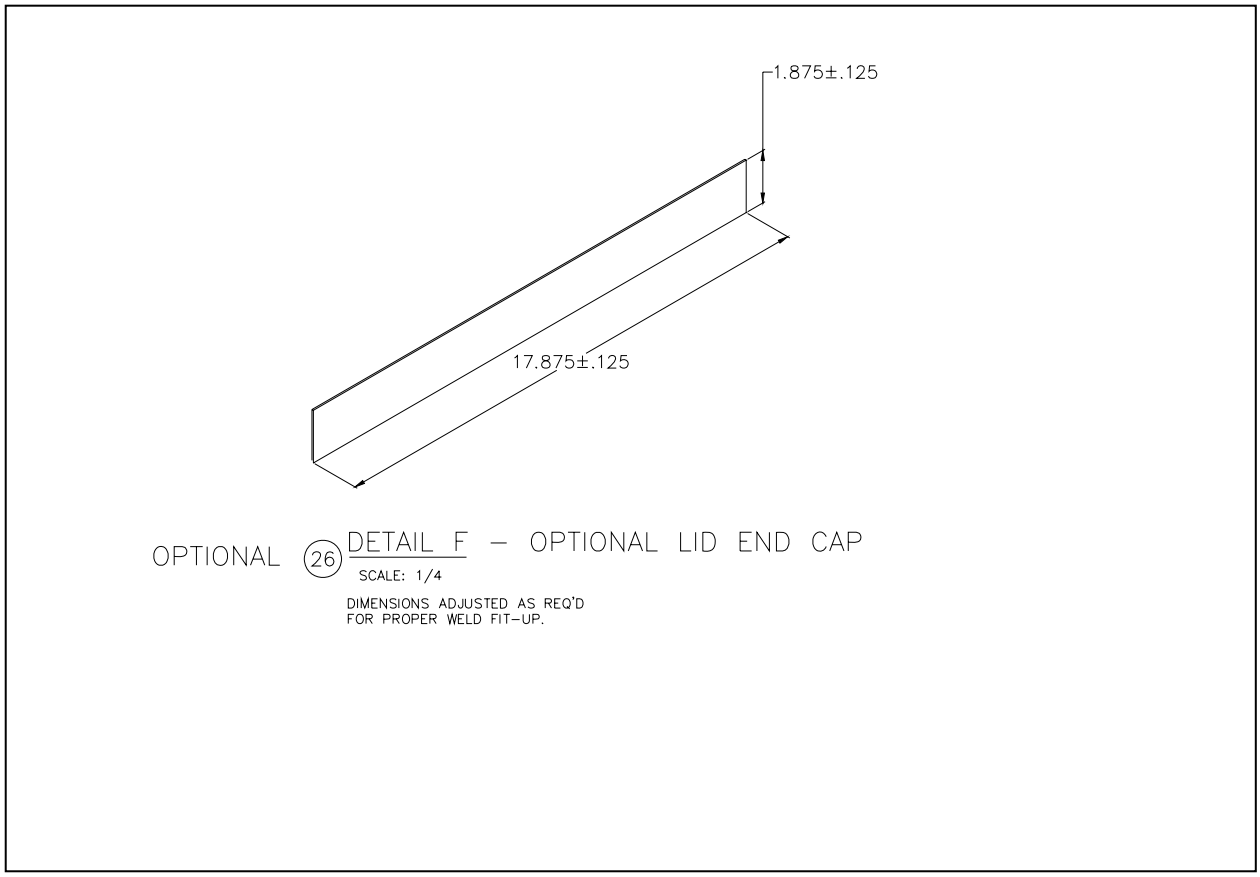
1. In Zone F4, change Sheet 2 Detail call-out from "DETAIL C" to "DETAILS C,F,G".
2. In the BoM, item 26, change "16 GA" to "16 GA MIN".
3. Add new Note 9 as follows: "FIBERGLASS OR POLYMER SCREEN MAY BE ADDED TO UNDERSIDE OF LID TO FACILITATE PACKING. MINIMUM MESH SIZE 0.039" [1000 MICRONS]. SEE SHEET 2 FOR APPROXIMATE LOCATION."

SHEET 2

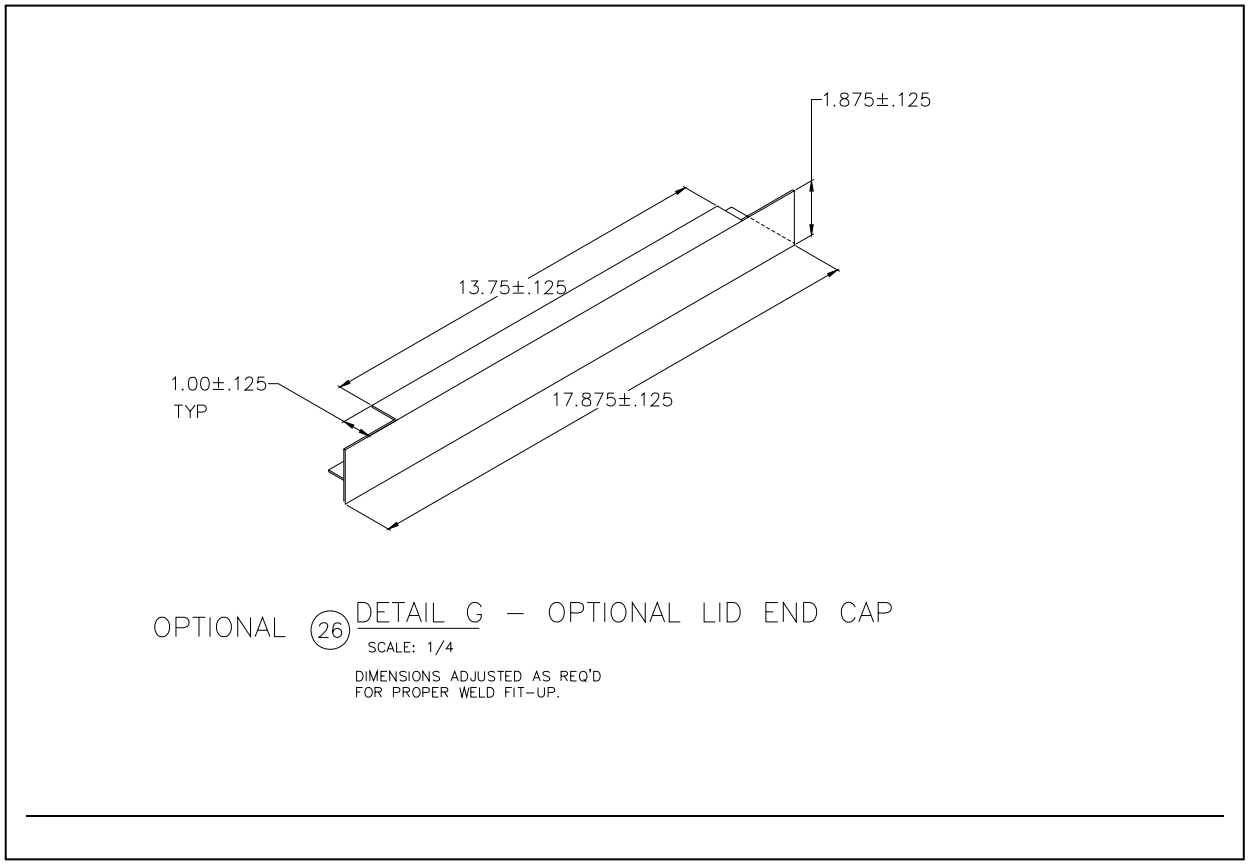
1. In Zone F6/F7, add new note to Section A-A with leader pointing to channel as shown in the sketch below:



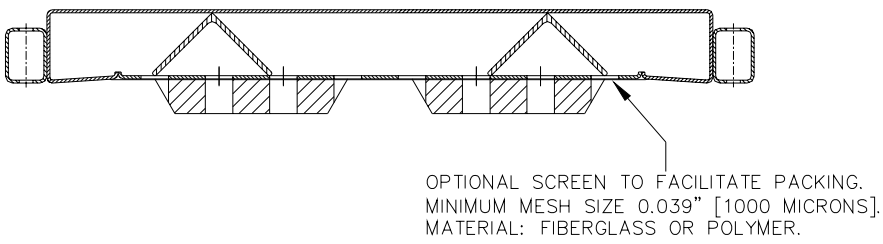
2. Add optional lid cap configuration, Detail F, near current Detail C as shown below:



3. Add optional lid cap configuration, Detail G, near current Detail C as shown below:



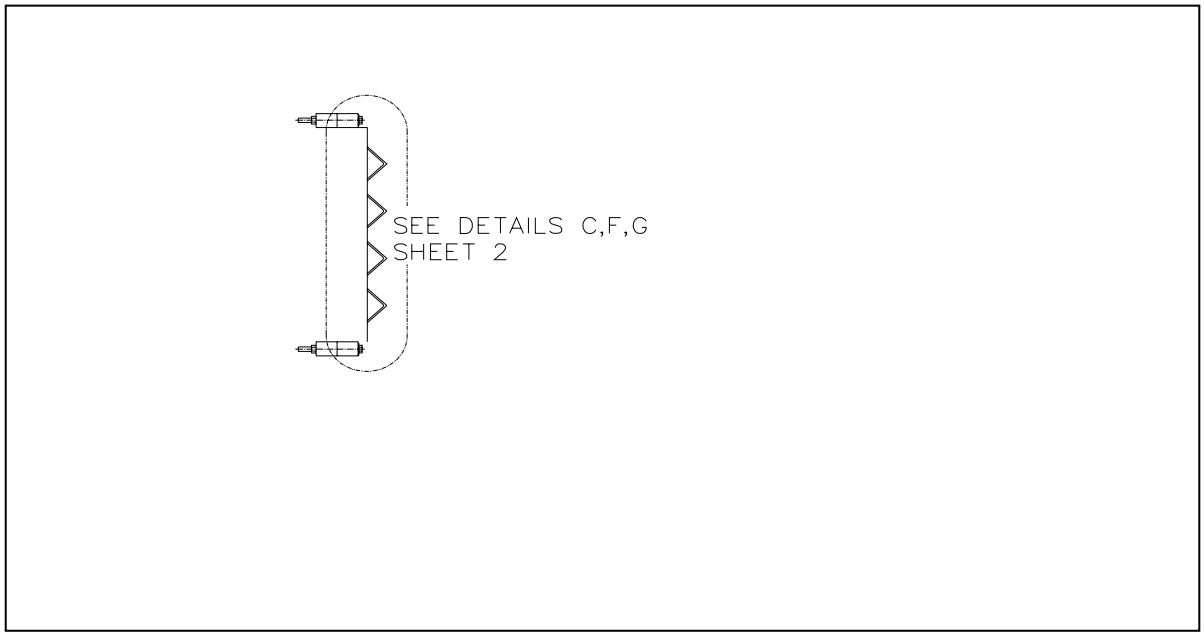
4. In Zones F3/F4 add note associated with inner box lid as shown in the sketch:



10015E58 Rev. 1, “Optional Patriot BWR Inner Shipping Package and Safety Items”

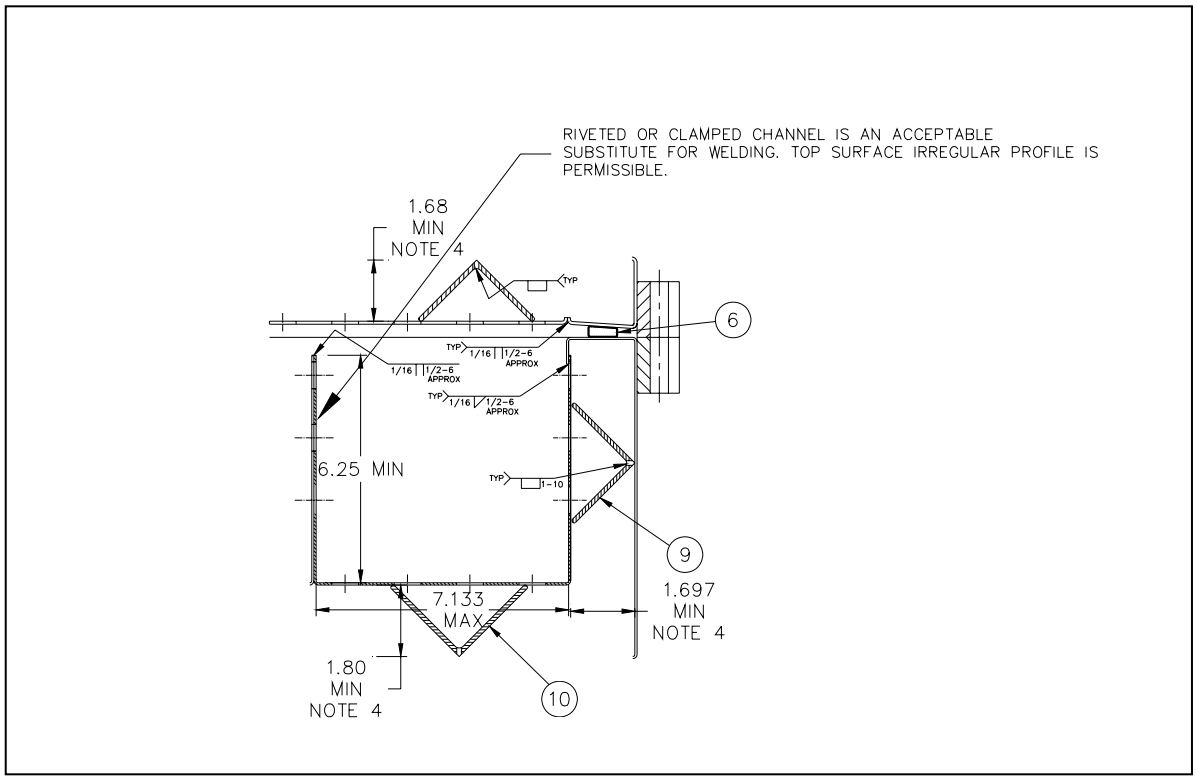
SHEET 1

1. Remove existing note 8. Add new note 8 as follows: “FIBERGLASS OR POLYMER SCREEN MAY BE ADDED TO UNDERSIDE OF LID TO FACILITATE PACKING. MINIMUM MESH SIZE 0.039” [1000 MICRONS]. SEE SHEET 2 FOR APPROXIMATE LOCATION.”
2. In Zone F4/G4, add new Detail callout to end as shown:

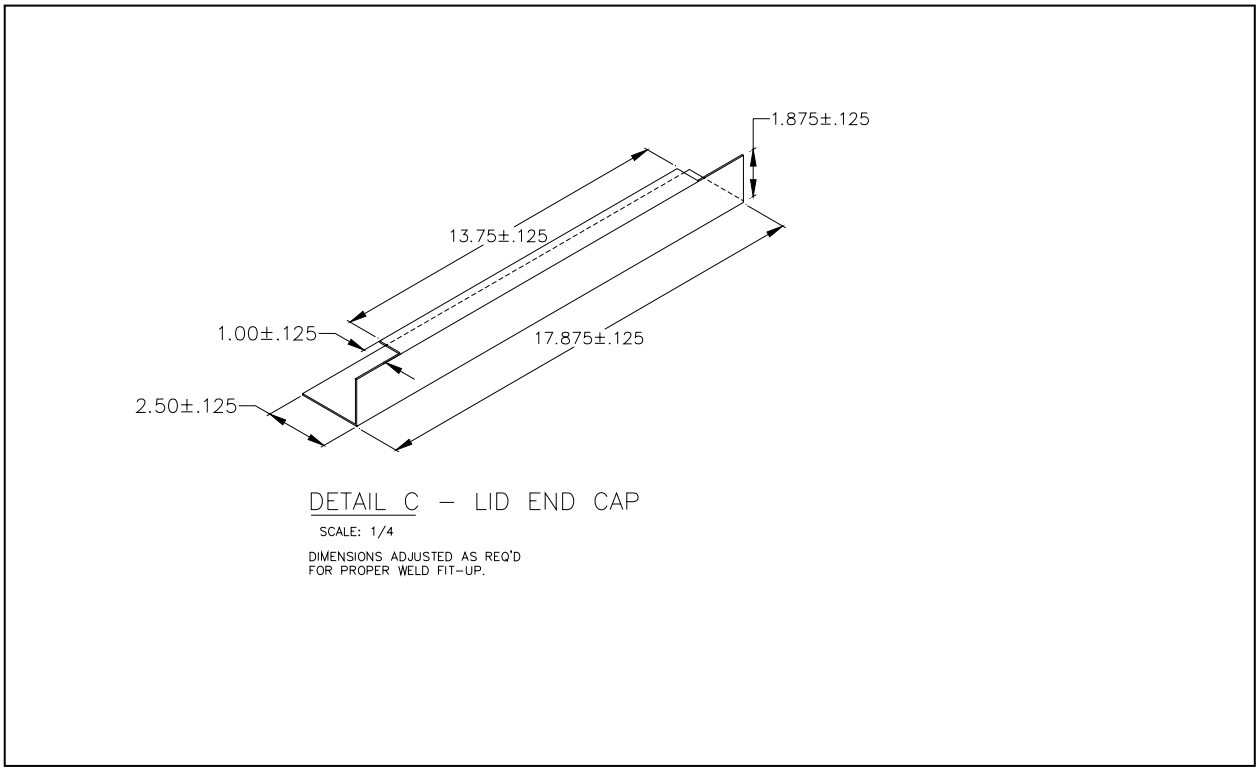


SHEET 2

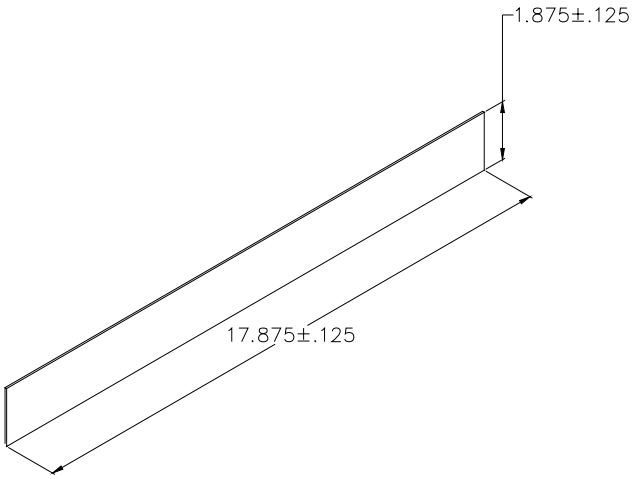
1. In Zone F5/F6, add new note to Section A-A with leader pointing to channel as shown in the sketch below:



2. Add lid cap configuration, Detail C, near Zones B1-D1, as shown below:



3. Add optional lid cap configuration, Detail F, near Zones B1-D1, as shown below:

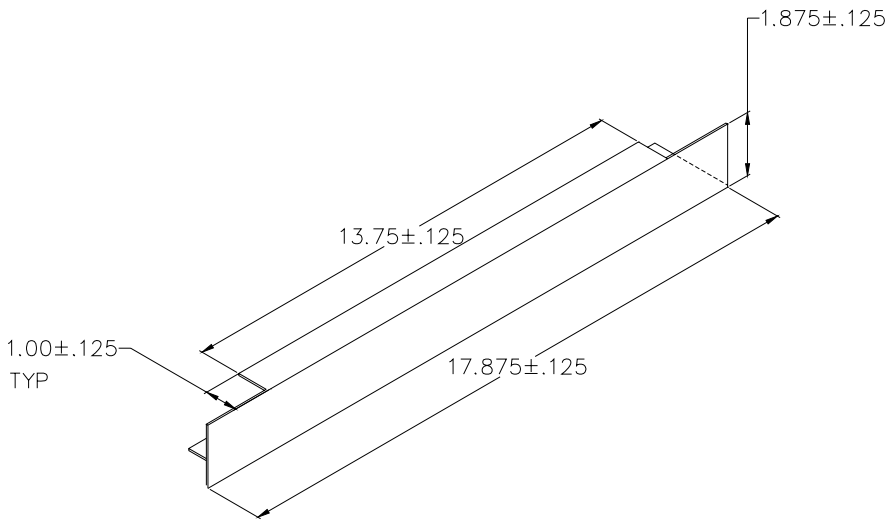


DETAIL F – OPTIONAL LID END CAP

SCALE: 1/4

DIMENSIONS ADJUSTED AS REQ'D
FOR PROPER WELD FIT–UP.

4. Add optional lid cap configuration, Detail G, near Zones B1-D1, as shown below:

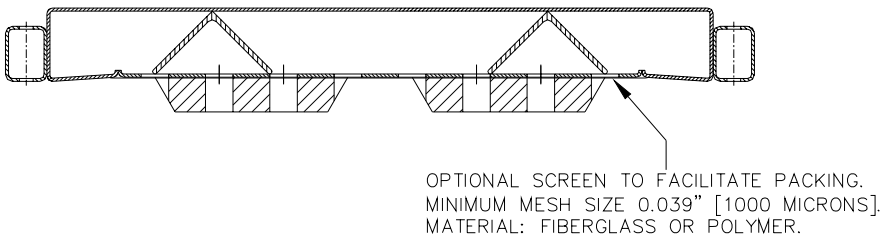


DETAIL G – OPTIONAL LID END CAP

SCALE: 1/4

DIMENSIONS ADJUSTED AS REQ'D
FOR PROPER WELD FIT–UP.

5. In Zones F2/F3 add note associated with inner box lid as shown in the sketch:



Enclosure 4: Previous Versions of Certificate of Compliance USA/9292/AF including NRC SER

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION REPORT

Docket No. 71-9292
Model No. PATRIOT Package
Certificate of Compliance No. 9292
Revision No. 4

SUMMARY

By application dated September 22, 2005, as supplemented January 6, 2006, Westinghouse Electric Company, LLC, submitted an amendment request for Certificate of Compliance (CoC) No. 9292 for the Model No. PATRIOT package. Specifically, Westinghouse requested to revise the package drawings to include the inner container of the CE-B1 package as an alternative inner container for use with the PATRIOT package.

The amendment request included the necessary analyses and proposed CoC and application page changes to support the amendment request. The new application page changes will be referenced in the CoC.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the amendment request, including the proposed CoC and application revisions, and other supporting documents submitted with the request. Based on the statements and representations in the application, as supplemented, the staff concludes that the Model No. PATRIOT package, as amended, meets the requirements of 10 CFR Part 71.

1.0 GENERAL INFORMATION

The applicant requested to revise Condition 5(a)(3) of the CoC, "Drawings," to include a new alternative inner container for the PATRIOT package. The revision will allow the inner container of the CE-B1 package (CoC No. 9272) to be used as an alternative inner container inside the PATRIOT outer package. The specific changes made to the CoC are discussed below, in the "Conditions" section of this Safety Evaluation Report (SER). Given the limited nature of this amendment request, only those sections affected will be discussed.

1.1 Drawings

The applicant provided additional engineering drawings describing the CE-B1 inner container to be used as an alternative (version #2) inner container in the PATRIOT package (Drawing No. 10015E58, Sheets 1 and 2, Rev. 1). Also, the applicant provided additional drawings and sketches illustrating the optional inner container configurations resulting from new maintenance and refurbishment activities. These drawings are provided in Chapter 8 of the application (Figure 8-1, Figure 8-7, and Figure 8-9).

2.0 STRUCTURAL

The applicant requested an amendment to CoC No. 9292 for the PATRIOT package, to include a new alternate inner container to be used inside the PATRIOT outer container. Specifically, the applicant provided additional engineering drawings to be referenced in the CoC that allow the inner container of the CE-B1 package (CoC No. 9272) to be used as an alternate inner container (version #2).

The PATRIOT and the CE-B1 packages belong to the same family of BWR fuel packages. A review of the engineering drawings for both the PATRIOT and the CE-B1 inner containers show that both inner containers are essentially the same in most aspects, excluding some minor dimension differences. The drawings show that both inner containers are fabricated from the same materials and, therefore, have the same weight when empty.

Based on a review of the engineering drawings and the information provided in the amendment application, the staff concludes that adding the CE-B1 inner container as an alternate inner container of the PATRIOT package will not affect the ability of the package to meet the structural performance requirements of 10 CFR Part 71.

6.0 CRITICALITY

The proposed amendment adds a new alternative inner container for use inside the PATRIOT outer container. The applicant requested to include the inner container of the CE-B1 package as an alternative inner container for the PATRIOT package. In order to determine the applicability of the PATRIOT criticality analysis to the CE-B1 inner container, the applicant performed a detailed comparison of the criticality analyses presented in both PATRIOT (CoC No. 9292) and CE-B1 (CoC No. 9272) Safety Analysis Reports (SARs).

The applicant's comparison of the criticality analyses for both the PATRIOT and the CE-B1 package show that both analyses use identical assumptions, models, and both draw the same conclusions. Only minor differences between the dimensions used for the inner container are observed, and these do not create any discrepancies in the criticality safety conclusions. Both criticality safety analyses assume the same fuel assembly types as the authorized contents of the packages.

Based on the review of the criticality safety analyses for both packages and the applicant's comparison of both analyses provided in the application, the staff concludes that the use of the CE-B1 inner container as an alternative inner container inside the PATRIOT package will not affect the ability of the package to meet the criticality safety requirements of 10 CFR Part 71.

8.0 ACCEPTANCE TESTS AND MAINTENANCE PROGRAM

The applicant provided revised maintenance procedures applicable to the current PATRIOT inner container and the new CE-B1 inner containers.

The new maintenance procedure describes the cleaning and painting process for the inner containers. The applicant provided a detailed outline of the steps performed during the cleaning and painting process, including a description of specific steps of the process that

involve altering or modifying the configuration of the package as described in the engineering drawings. The applicant provided additional drawings (Figure 8-1, Figure 8-7, and Figure 8-9), detailing the possible package configurations resulting from these maintenance activities.

CONDITIONS

The following conditions in CoC No. 9292, Revision No. 4, have been revised as follows:

Condition No. 5(a)(2) was revised to include revised dimensions for the outer container, and to reference the new type of inner container. The original PATRIOT inner container is identified as "version #1 inner container," and the CE-B1 inner container is identified as "version #2 (optional) inner container."

Condition No. 5(a)(3) was revised to include new engineering drawing references describing the new type of inner container, and the possible package configurations resulting from maintenance and refurbishment activities.

Condition No. 9 of the certificate has been added to specify that the use of the version #2 (optional) inner container (CE-B1 inner container) is limited to those containers with Serial Nos. 001 through 039, inclusive. This condition is added to ensure that no additional fabrication of this inner container is performed, as specified in CoC No. 9272, Rev. 6. All other conditions have been renumbered accordingly.

A new Condition No. 11 was added to authorize the use of the previous revision of the certificate for a period of approximately one year.

CONCLUSIONS

Based upon the staff's review, the statements and representations in the application, as supplemented, for the reasons stated in this Safety Evaluation Report, and with the conditions listed above, we conclude that these changes will not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9292, Revision No. 4,
on January 17, 2006.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 17, 2006

Mr. Norman A. Kent, Manager
Transport Licensing and Regulatory Compliance
Westinghouse Electric Company
P.O. Drawer R
Columbia, SC 29250

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9292 FOR THE MODEL NO. PATRIOT PACKAGE

Dear Mr. Kent:

As requested by your application dated September 22, 2005, as supplemented January 6, 2006, enclosed is Certificate of Compliance (CoC) No. 9292, Revision No. 4, for the Model No. PATRIOT package. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's Safety Evaluation Report is also enclosed.

Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.17 or 49 CFR 173.471. The approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of 49 CFR 173.471. Registered Users may request by letter to remove their names from the Registered Users List.

If you have any questions regarding this certificate, please contact me or Mr. Jose R. Cuadrado of my staff at (301) 415-8500.

Sincerely,

Robert A. Nelson, Chief
Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9292
TAC No. L23900

Enclosures:
1. Certificate of Compliance No. 9292, Rev. No. 4
2. Safety Evaluation Report
3. Registered Users List

cc w/encls 1 & 2: R. Boyle, Department of Transportation
J. Shuler, Department of Energy
RAMCERTS
Registered Users

REGISTERED USERS FOR COC NO. 9292

Westinghouse Electric Company
Attn: Norman A Kent
Columbia Fuel Site
P.O. Drawer R
Columbia, SC 29250

Westinghouse Electric Company, LLC
Attn: Mr. A. J. Nardi
P.O. Box 355
Pittsburgh, PA 15230-0355

NRC FORM 618 (8-2000) 10 CFR 71			U.S. NUCLEAR REGULATORY COMMISSION		
CERTIFICATE OF COMPLIANCE FOR RADIOACTIVE MATERIAL PACKAGES					
1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9292	4	71-9292	USA/9292/AF-85	1 OF	5

2. PREAMBLE

a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."

b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

a. ISSUED TO *(Name and Address)*

Westinghouse Electric Company, LLC
P.O. Box 355
Pittsburgh, PA 15230-0355

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

Westinghouse Electric Company, LLC application dated September 16, 2004, as supplemented.

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

(1) Model No.: PATRIOT

(2) Description

A shipping container for unirradiated fuel assemblies. The package consists of a right rectangular metal inner container and a wooden outer container, with cushioning material between the inner and outer containers.

There are two versions of the metal inner container. Both versions measure approximately 11-1/4 inches high by 18-1/8 inches wide by 182 inches long. There are two channel sections within the inner container, and each channel section holds one BWR fuel assembly. The inner container is equipped with a lid and an end cap that are closed by 18 bolts and fastening lugs. The overall dimensions of the wooden outer container are approximately 30-1/4 inches wide by 31-1/4 inches high by 207-3/4 inches long. The cushioning material between the inner and outer containers is phenolic impregnated honeycomb and ethafoam. The inner container may be positioned on a series of vibration dampers mounted on the inside bottom of the wooden outer container.

The maximum weight of the package, including contents, is 2,988 pounds with the version #1 inner container and 2,964 pounds with the version #2 (optional) inner container.

5.(a)(3) Drawings

The packaging is constructed and assembled in accordance with Westinghouse Electric Company, LLC Drawing Nos.:

10014E27, Rev. 1,
10014E28, Sheets 1 and 2, Rev. 1,
10015E58, Sheets 1 and 2, Rev. 1,
Packaging configurations shown in Figure 8-1, 8-7, and 8-9 of supplement dated January 6, 2006, are authorized.

5.(b) Contents

(1) Type and form of material

The package is designed to hold two unirradiated BWR fuel assemblies, comprised of UO_2 fuel rods in a 10 x 10 square array. The fuel cross-sectional area is 25 square inches.

(i) Description of Assembly Type #1

Each assembly is made up of 96 full-length fuel rods having a maximum active fuel length of 150 inches. The fuel pellet diameter is 0.819 ± 0.002 cm, encapsulated in 0.063 cm zirconium alloy cladding. There is a 0.0085 cm gap between the pellets and the cladding. The maximum U-235 enrichment of any fuel rod is 5.0 weight percent. Each assembly contains water holes in the four center rod positions of the assembly. Three different fuel package loadings have the following specifications:

(A) Maximum average U-235 enrichment is 4.0 weight percent within any axial zone of the assembly; Maximum U-235 content is 3.25 weight percent of any gadolinia-urania rod or axial zone of any gadolinia-urania fuel rod; Maximum number of fuel rods per assembly containing 5.0 weight percent U-235 enriched pellets is 36; Maximum U-235 enrichment is 4.0 weight percent for all edge rods, and 3.5 weight percent for all corner rods; Each assembly must include at least eight fuel rods with a minimum gadolinia content of 2.5 weight percent in all axial regions with enriched pellets. The eight gadolinia rods are arranged with two rods in each quadrant of the fuel assembly. The two gadolinia rods within each quadrant must be symmetric about the geometric diagonal of the fuel assembly, and must not be in an edge or corner rod location. Other fuel rods containing gadolinia may be present.

(B) Maximum average U-235 enrichment is 4.725 weight percent within any axial zone of the assembly; Maximum U-235 content is 4.2 weight percent of any gadolinia-urania rod or axial zone of any gadolinia-urania fuel rod; Maximum number of fuel rods per assembly containing 5.0 weight percent U-235 enriched pellets is 52; Maximum U-235 enrichment is 4.5 weight percent for all edge rods, and 4.0 weight percent for all corner rods; Each assembly must include at least eight fuel rods with a minimum gadolinia content of 5.3 weight percent in all axial regions with enriched pellets. The eight gadolinia rods are arranged with two rods in each quadrant of the fuel assembly. The two gadolinia rods within each quadrant must be symmetric about the geometric diagonal of the fuel assembly, and must not be in an edge or corner rod location. Other fuel rods containing gadolinia may be present.

5.(b) Contents (continued)

(C) Maximum average U-235 enrichment is 4.858 weight percent within any axial zone of the assembly; Maximum U-235 content is 4.2 weight percent of any gadolinia-urania rod or axial zone of any gadolinia-urania fuel rod; Maximum number of fuel rods per assembly containing 5.0 weight percent U-235 enriched pellets is 80; Maximum U-235 enrichment is 4.0 weight percent for all corner rods; Each assembly must include at least twelve fuel rods with a minimum gadolinia content of 2.4 weight percent in all axial regions with enriched pellets. The twelve gadolinia rods are arranged with three rods in each quadrant of the fuel assembly. The three gadolinia rods within each quadrant must be symmetric about the geometric diagonal of the fuel assembly, and must not be in an edge or corner rod location. Other fuel rods containing gadolinia may be present.

(ii) Description of Assembly Type #2

Each assembly is made up of 96 fuel rods having a maximum active fuel length of 150 inches. Each assembly contains four one-third length fuel rods and eight two-thirds length fuel rods. The four one-third length fuel rods are located on the outside corners of the assembly. The eight two-thirds length fuel rods, arranged as two rods in each quadrant of the assembly, are located on the geometric diagonal toward the center of the assembly. The fuel pellet diameter is 0.848 cm nominal, encapsulated in 0.061 cm nominal zirconium alloy cladding. There is a 0.0075 cm gap between the pellets and the cladding. The maximum U-235 enrichment of any fuel rod is 5.0 weight percent. Each assembly contains water holes in the four center rod positions of the assembly. The fuel assembly must be transported in channels. The specifications for each one-third length axial section of the fuel assembly are as follows:

(A) Upper section must contain 84 fuel rods, arranged as 21 rods per quadrant. Maximum U-235 enrichment of any rod is 5.0 weight percent. This section of the assembly must include at least eight fuel rods with a minimum gadolinia content of 4.0 weight percent in all axial regions with enriched pellets. The eight gadolinia rods are arranged with two rods in each quadrant of the fuel assembly, arranged symmetrically along the geometric diagonal of the assembly, and must not be in an edge or corner rod location. The section must contain 12 water holes, arranged as three water holes in each quadrant of the assembly. One of the three water holes within each quadrant must be located on the outside corner location of the assembly, and the other two water holes must be located on the geometric diagonal of the fuel assembly. Other fuel rods containing gadolinia may be present.

(B) Middle section must contain 92 fuel rods, arranged as 23 rods per quadrant. Maximum U-235 enrichment of any rod is 5.0 weight percent. This section of the assembly must include at least ten fuel rods with a minimum gadolinia content of 4.0 weight percent in all axial regions with enriched pellets. The ten gadolinia rods must be arranged symmetrically along the geometric diagonal of the assembly, and must not be in an edge or corner rod location. The section must contain four water holes, arranged as one water hole in each quadrant of the assembly. Each water hole within each quadrant must be located on the outside corner location of the assembly. Other fuel rods containing gadolinia may be present.

(C) Lower section must contain 96 fuel rods, arranged as 24 rods per quadrant. Maximum U-235 enrichment of any rod is 5.0 weight percent. This section of the assembly must include at least twelve fuel rods with a minimum gadolinia content of 4.0 weight percent in all axial regions with enriched pellets. The twelve gadolinia rods must be arranged symmetrically along the geometric diagonal of the assembly, and must not be in an edge or corner rod location. Other fuel rods containing gadolinia may be present.

5.(b)(2) Maximum quantity of material per package

Two fuel assemblies. The total weight of contents not to exceed 1,320 pounds.

5.(c) Criticality Safety Index: 1.0

6. Each fuel assembly must be unsheathed or must be enclosed in an unsealed, polyethylene sheath which may not extend beyond the ends of the fuel assembly. The ends of the sheath may not be folded or taped in any manner that would prevent the flow of liquids into, or out of, the sheathed fuel assembly.

7. For the contents described in 5.(b)(1)(i), polyethylene inserts may be positioned between rods within the fuel assemblies. The quantity of polyethylene must not exceed 18.33 g polyethylene per centimeter length of the fuel assembly, and must not exceed a total of 6.99 kg per fuel assembly. The polyethylene may be borated. No polyethylene inserts may be used for the contents described in 5.(b)(1)(ii).

8. In addition to the requirements of Subpart G of 10 CFR Part 71:

(a) The package must be prepared for shipment and operated in accordance with the Operating Procedures in Chapter 7 of the application.

(b) Each packaging must be acceptance tested and maintained in accordance with the Acceptance Tests and Maintenance Program in Chapter 8 of the application.

9. For packagings fabricated in accordance with Drawing No. 10015E58, Rev. 1 (referred to as version #2 inner containers), only Serial Nos. 001 through 039, inclusive, are authorized for use.

10. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

11. Revision No. 3 of this certificate may be used until January 31, 2007.

12. Expiration date: August 31, 2010.

NRC FORM 618 (8-2000) 10 CFR 71			U.S. NUCLEAR REGULATORY COMMISSION		
CERTIFICATE OF COMPLIANCE FOR RADIOACTIVE MATERIAL PACKAGES					
1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9292	4	71-9292	USA/9292/AF-85	5 OF	5

REFERENCES

Westinghouse Electric Company, LLC consolidated application dated: September 16, 2004.

Supplements dated: April 14, June 14, August 9, September 22, 2005; and January 6, 2006.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Robert A. Nelson, Chief
Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

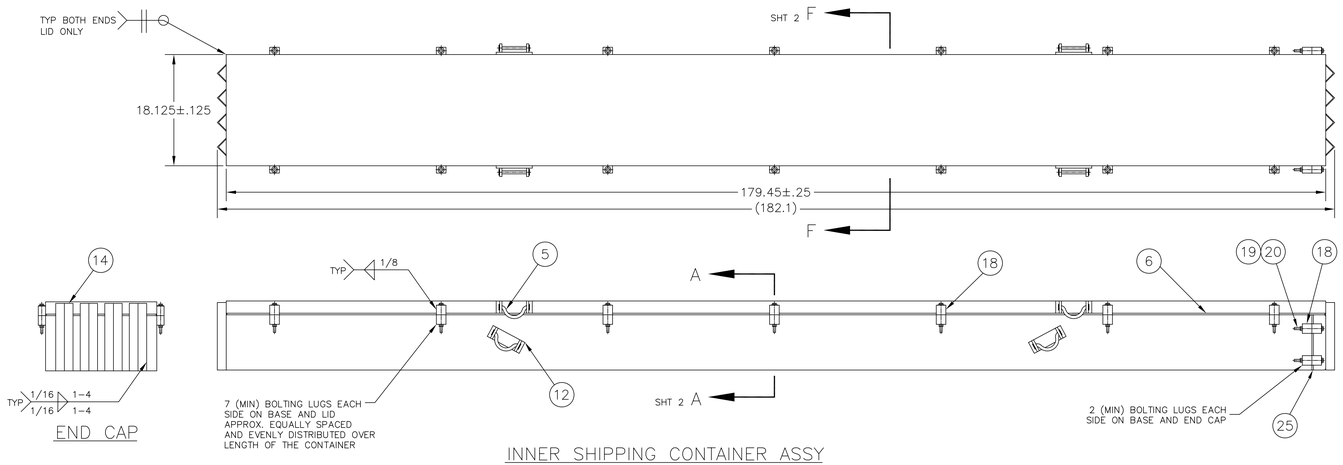
Date: January 17, 2006

TOLERANCES

UNLESS OTHERWISE SPECIFIED

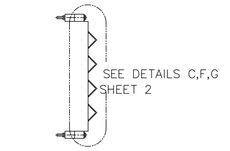
ONE PLACE DECIMAL	±. 1
TWO PLACE DECIMAL	±. 02
THREE PLACE DECIMAL	±. 005

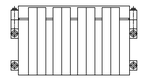
IDENT CLASS / GROUP NOTE					BILL OF MATERIAL		
REQ'D.. 02	REQ'D.. 01	ITEM	NOTE	IDENT	PART NAME	(SIZE) REFERENCE INFORMATION	MATL SIZE CODE PART NUMBER OR REF DWG
		1	S		IC-LID SHELL	16 GA MIN	C-STEEL
		2	S		IC-LID LINER	16 GA MIN	C-STEEL
		3	S		IC-LID SUPPORT ANGLE	2.5 x 2.5 x .125	C-STEEL
		4			IC-LID PADDING	1" THK OPTIONAL	ETHAFOAM OR EQUIV.
		5			IC-LID LIFTING HOOKS		STEEL
		6			IC-LID GASKET		RUBBER
		7	S		IC-BASE SHELL	16 GA MIN	C-STEEL
		8	S		IC-BASE BASKET	16 GA	C-STEEL
		9	S		IC-BASE ANGLE (SIDE)	2.5 x 2.5 x .125	STEEL
		10	S		IC-BASE ANGLE (BOTTOM)	2.8 x 2.8 x .125	STEEL
		11			IC-BASKET PADDING	OPTIONAL	ETHAFOAM OR EQUIV.
		12			IC-BASE LIFTING HOOKS	OPTIONAL	STEEL
		13	S		IC-BASE UPPER END FLANGE	1 x 1 x .125	C-STEEL
		14	S		IC-BASE END ANGLES	2 x 2 x .125	C-STEEL
		15	S		END CAP OUTER SHELL	16 GA MIN	C-STEEL
		16	S		END CAP FLANGE	1 x 1 x .125	C-STEEL
		17	S		END CAP ANGLES	2 x 2 x .125	C-STEEL
		18	S		IC-BOLTING LUGS	SEE NOTE 1	C-STEEL
		19	S		IC-BOLT	SEE NOTE 2	MILD STEEL OR STRONGER
		20	S		IC-NUT	3/8 DIA MIN	MILD STEEL OR STRONGER
		21			IC-PRESSURE VACUUM RELIEF VALVE		
		22			IC- SPACER BLOCK		WOOD/PLASTIC/METAL
		23			IC-PRODUCT POSITIONING PADS	OPTIONAL	RUBBER
		24			IC-SPACER BLOCK PAD	OPTIONAL	
		25			END CAP GASKET		RUBBER



END CAP

INNER SHIPPING CONTAINER ASSY

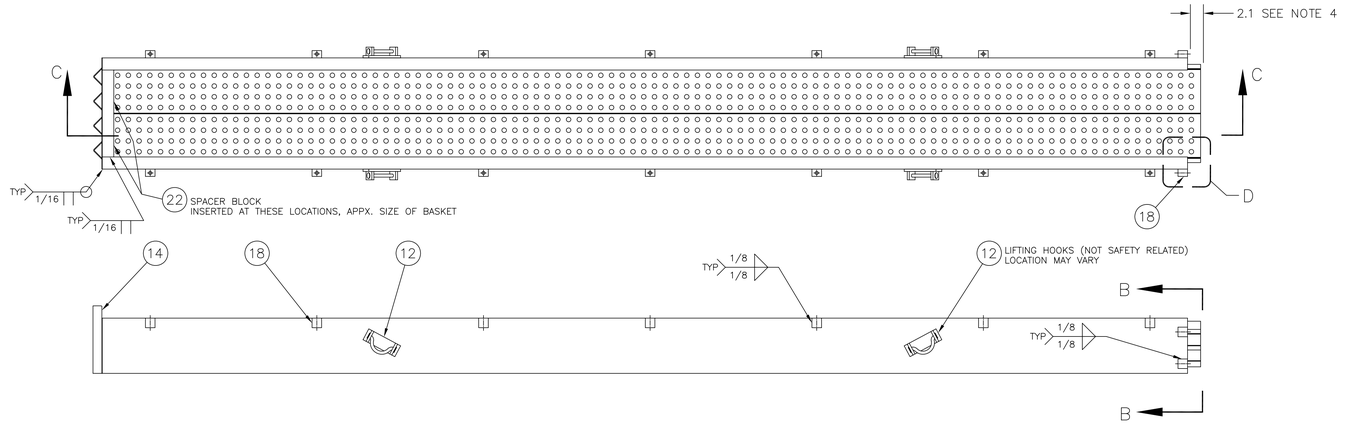




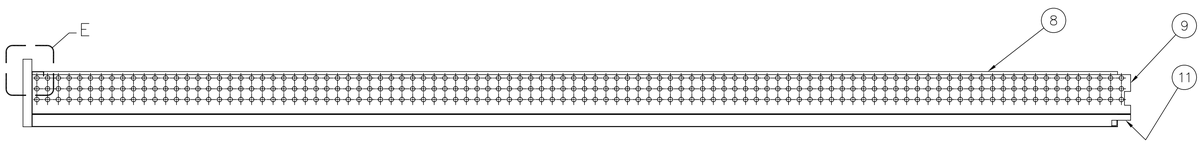
END COVER

NOTES:
1. BOLT LUGS 1.56 x 1.19 x 1.56 W/ 0.53ø HOLE THRU APPROXIMATE CENTER.
2. BOLT DIA 3/8 MIN. LENGTH SUFFICIENT TO FULLY ENGAGE NUT.
3. LID AND END CAP FASTENERS SHALL BE AT LEAST WRENCH TIGHT DURING TRANSPORT WHEN THE CONTAINERS CONTAIN SPECIAL NUCLEAR MATERIAL.
4. MINIMUMS PROVIDED ARE AN AVERAGE OF SEVERAL MEASUREMENTS OVER THE LENGTH OF THE CONTAINER. LOCAL MEASUREMENTS MAY BE LESS THAN THE STATED VALUE.
5. ITEMS 9 AND 10 ARE SLOTTED AS NECESSARY TO ACCOMMODATE FLANGE AT END OF BASE.
6. WASHERS ARE OPTIONAL.
7. CRACKED OR DAMAGED WELDS SHALL BE REPAIRED. WELD REPAIRS MAY BE PERFORMED IN ACCORDANCE WITH AWS D1.1 AND/OR ASME SECT IX.
8. FIBERGLASS OR POLYMER SCREEN MAY BE ADDED TO UNDERSIDE OF LID TO FACILITATE PACKING. MINIMUM MESH SIZE 0.039" [1000 MICRONS]. SEE SHEET 2 FOR APPROXIMATE LOCATION.

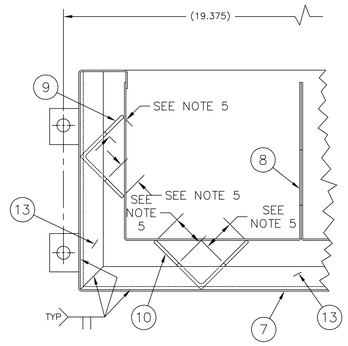
S. SAFETY RELATED ITEM.



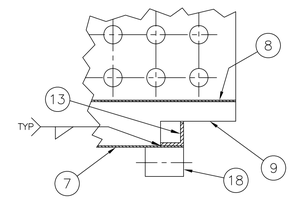
INNER CONTAINER BASE



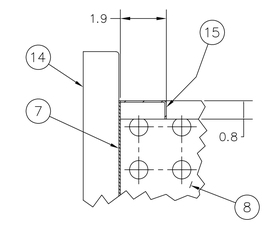
SECTION C-C



PARTIAL VIEW B-B
SCALE: 1/4



DETAIL D
SCALE: 1/4



DETAIL E
SCALE: 1/4

SD 752331 D 0000080-0 IT 752558 ECN 0000271-1 CHANGE 2

SEE ECN FOR CHANGES

C. LAWSON 04/05/06

SEE PRODUCT SPECIFICATION PDINF000 FOR SUPPLEMENTAL PRODUCT INFORMATION

DWG REF

NEXT ASSY

THIRD ANGLE PROJECTION

DFTM	CANTRELL	8/31/05
CHKD	N. PRESTO	8/31/05
DES ENG	B. HEMPY	8/15/05
MFG ENG	S. PALMER	8/22/05
PA ENG	T. BROWN	8/19/05
DES ENG MGR	M. DYE	8/22/05
APPD	N. KENT	8/16/05
APPD	G. SUMMERS	8/17/05
APPD	J. HALLIGAN	8/18/05

Westinghouse ELECTRIC COMPANY LLC - NUCLEAR FUEL COLUMBIA, SC USA

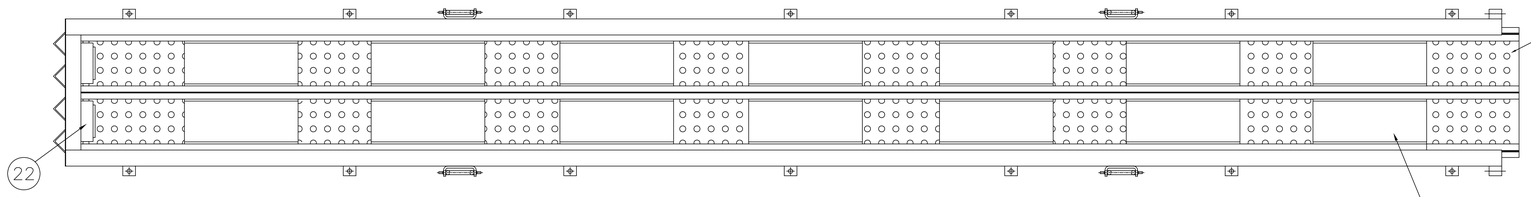
OPTIONAL PATRIOT BWR INNER SHIPPING PACKAGE AND SAFETY ITEMS

SIZE | FSCM NO | DWG NO 10015E58 | REV 2

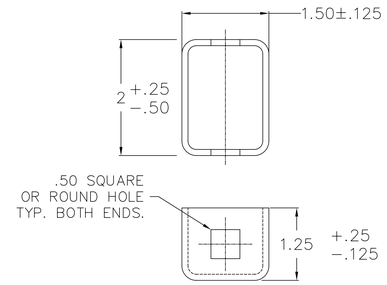
SCALE | WEIGHT(LBS) | SHEET 1 OF 2 SHEETS

DIMENSIONS IN INCHES

CADAM DRAWING DO NOT REVISE MANUALLY



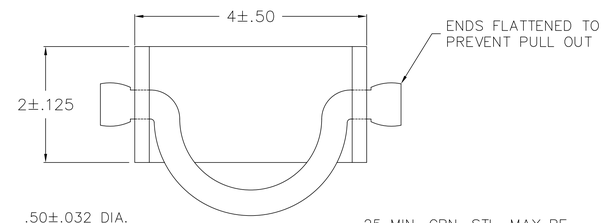
INNER SHIPPING CONTAINER ETHAFOAM & LINER INSTALLATION

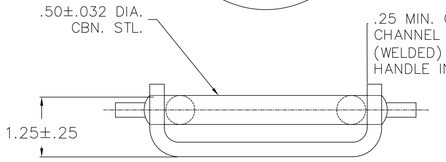


MIN 12 GA. CBN. STL.
FAB. DRAWN OR SOLID
(36) PLCS TOTAL

DETAIL A – LUG

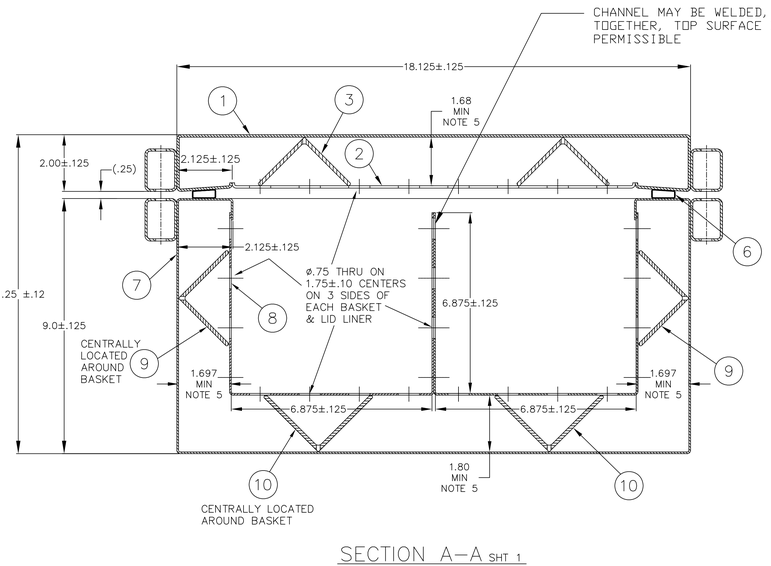
SCALE: 1/2





DETAIL B – HANDLE

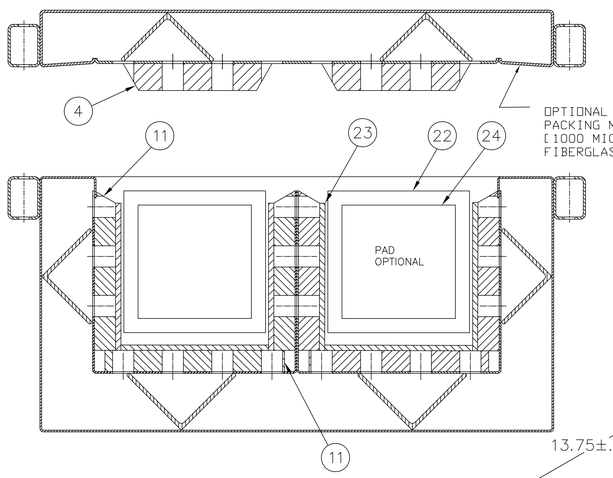
SCALE: 1/2



SECTION A–A SHT 1

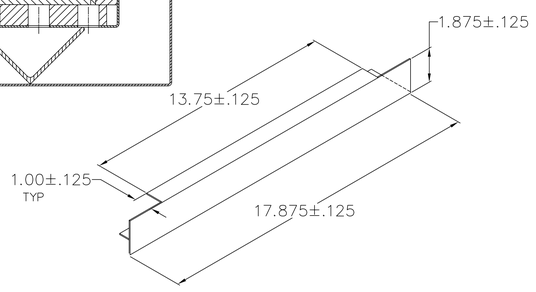
(OPTIONAL PADDING NOT SHOWN)

SCALE: 1/4



SECTION F–F

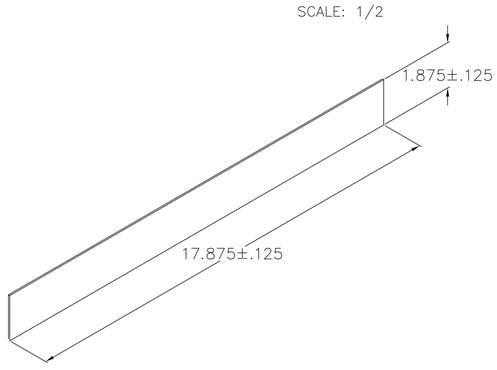
SCALE: 1/4

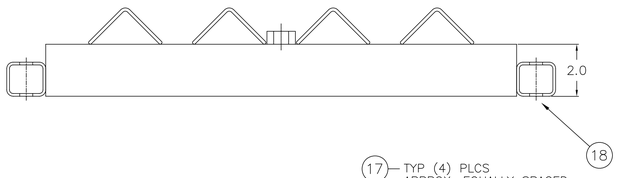


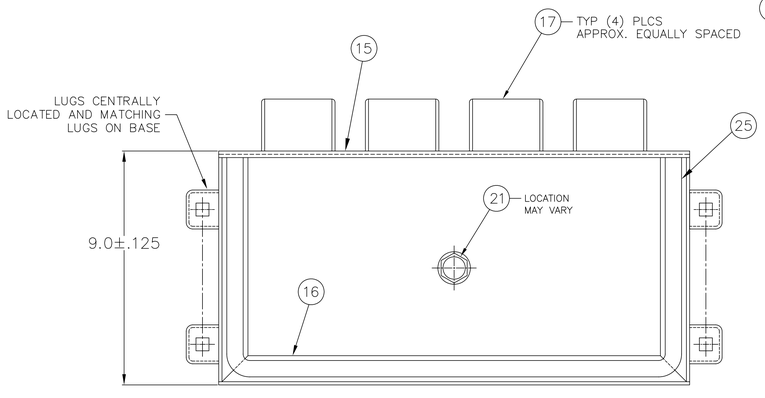
OPTIONAL (26) DETAIL G – OPTIONAL LID END CAP

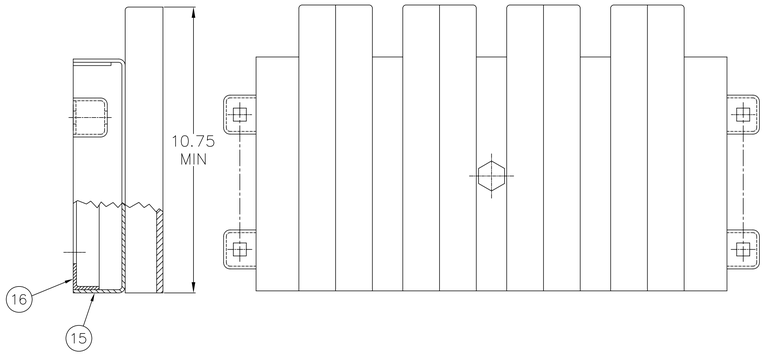
SCALE: 1/4

DIMENSIONS ADJUSTED AS REQ'D FOR PROPER WELD FIT–UP.









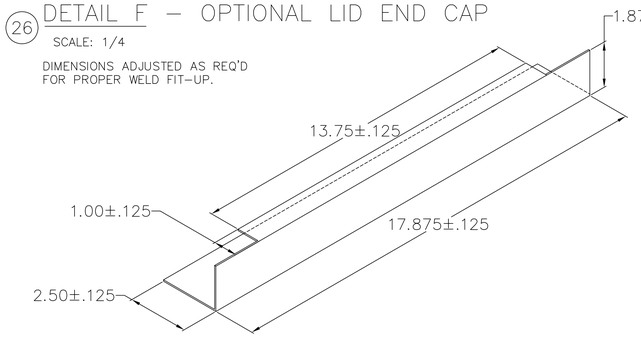
INNER END COVER ASSY

SCALE: 1/4

OPTIONAL (26) DETAIL F – OPTIONAL LID END CAP

SCALE: 1/4

DIMENSIONS ADJUSTED AS REQ'D FOR PROPER WELD FIT–UP.



(26) DETAIL C – LID END CAP

SCALE: 1/4

DIMENSIONS ADJUSTED AS REQ'D FOR PROPER WELD FIT–UP.

SD 752331/NCSC
D ECN 61214-0
ITI CHANGE 2
752558
ECN 0000271-1
SEE ECN FOR CHARGES
C. LAWSON 05-05-06

SEE PRODUCT SPECIFICATION PDINF000 FOR SUPPLEMENTAL PRODUCT INFORMATION

DWG REF
NEXT ASSY
THIRD ANGLE PROJECTION

DFTM	C. LAWSON	07/23/04
CHKD	B. JONES	07/23/04
DES ENG	B. E. HEMPY	05/25/04
MFG ENG	S. PALMER	06/30/04
PA ENG	J. COILE	06/30/04
DES ENG MGR	B. HERWIG	07/06/04
APPD	G. SUMMERS	06/29/04
APPD	T. LOIGNON	06/30/04
APPD		

Westinghouse ELECTRIC COMPANY LLC - NUCLEAR FUEL COLUMBIA, SC USA

PATRIOT BWR
INNER SHIPPING PACKAGE AND SAFETY ITEMS

SIZE | FSCM NO | DWG NO 10014E28 | REV 2
SCALE | WEIGHT(LBS) | SHEET 2 OF 2 SHEETS

DIMENSIONS IN INCHES

CADAM DRAWING
DO NOT REVISE MANUALLY

NOTES:

1. CONTAINERS FABRICATED AND/OR PURCHASED AND INSPECTED IN ACCORDANCE WITH PROGRAMS CONSISTENT WITH 10CFR50 APPENDIX B, ANSI N542, ASME/ANSI NQA-1, AND USNRC REG GUIDE 1.28.
2. ALL PERMANENTLY ATTACHED PARTS ARE WELDED IN ACCORDANCE WITH L-9292-03 REQUIREMENTS.
3. BOLT DIA 3/8 MIN. LENGTH SUFFICIENT TO FULLY ENGAGE NUT.
4. LID AND END CAP FASTENERS SHALL BE AT LEAST HAND TIGHT DURING TRANSPORT WHEN THE CONTAINERS CONTAIN SPECIAL NUCLEAR MATERIAL.
5. MINIMUMS PROVIDED ARE AN AVERAGE OF SEVERAL MEASUREMENTS OVER THE LENGTH OF THE CONTAINER. LOCAL MEASUREMENTS MAY BE LESS THAN THE STATED VALUE.
6. ITEMS 9 AND 10 ARE SLOTTED AS NECESSARY TO ACCOMMODATE FLANGE AT END OF BASE.
7. WASHERS ARE OPTIONAL.
8. CRACKED OR DAMAGED WELDS SHALL BE REPAIRED. WELD REPAIRS MAY BE PERFORMED IN ACCORDANCE WITH AWS D1.1 AND/OR ASME SECT IX OR APPROVED EQUIVALENT.
9. FIBERGLASS OR POLYMER SCREEN MAY BE ADDED TO UNDERSIDE OF LID TO FACILITATE PACKING. MINIMUM MESH SIZE 0.039" [1000 MICRONS] SEE SHEET 2 FOR APPROXIMATE LOCATION,

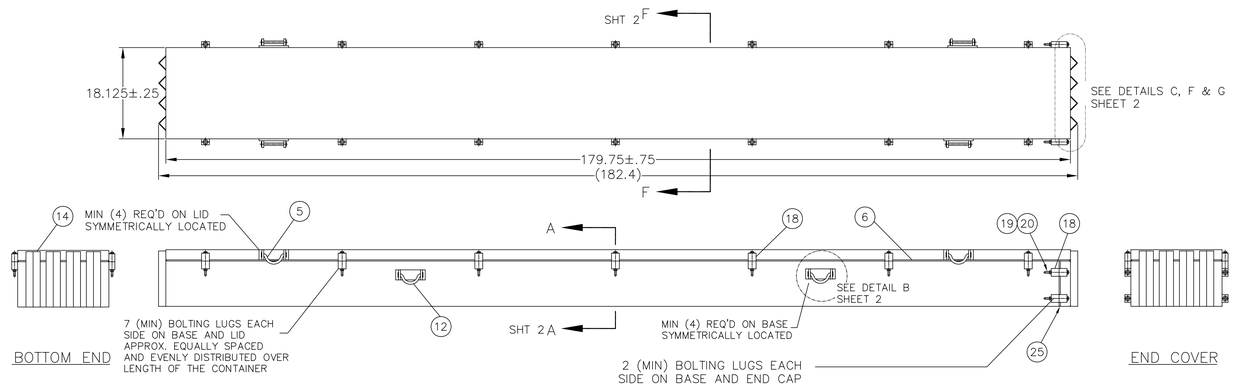
S. SAFETY RELATED ITEM.

TOLERANCES

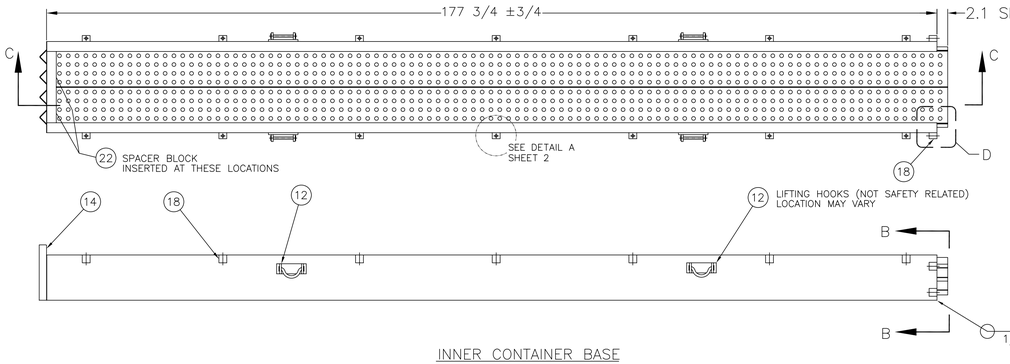
UNLESS OTHERWISE SPECIFIED

ONE PLACE DECIMAL	±. 1
TWO PLACE DECIMAL	±. 02
THREE PLACE DECIMAL	±. 005
ANGLES	±0° 30′
CHAMFERS	±5°

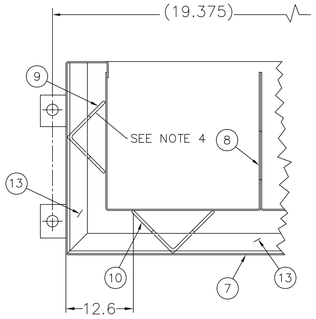
		IDENT CLASS / GROUP NOTE			BILL OF MATERIAL		
REQ'D. 02	REQ'D. 01	ITEM	NOTE	IDENT	PART NAME	(SIZE) REFERENCE INFORMATION	MATL SIZE CODE PART NUMBER OR REF DWG
		1	S		IC-LID SHELL	16 GA MIN	C-STEEL
		2	S		IC-LID LINER	16 GA MIN	C-STEEL
		3	S		IC-LID SUPPORT ANGLE	2.65 x 2.65 x .125	C-STEEL
		4			IC-LID PADDING	1" THK OPTIONAL	ETHAFOAM OR EQUIV.
		5			IC-LID LIFTING HOOKS		STEEL
		6			IC-LID GASKET		RUBBER
		7	S		IC-BASE SHELL	16 GA MIN	C-STEEL
		8	S		IC-BASE BASKET	16 GA	C-STEEL
		9	S		IC-BASE ANGLE (SIDE)	2.65 x 2.65 x .125	STEEL
		10	S		IC-BASE ANGLE (BOTTOM)	2.65 x 2.65 x .125	STEEL
		11			IC-BASKET PADDING	OPTIONAL	ETHAFOAM OR EQUIV.
		12			IC-BASE LIFTING HOOKS		STEEL
		13	S		IC-BASE UPPER END FLANGE	1 x 1 x .125	C-STEEL
		14	S		IC-BASE END ANGLES	2 x 2 x .125	C-STEEL
		15	S		END CAP OUTER SHELL	16 GA MIN	C-STEEL
		16	S		END CAP FLANGE	1 x 1 x .125	C-STEEL
		17	S		END CAP ANGLES	2 x 2 x .125	C-STEEL
		18	S		IC-BOLTING LUGS	12 GA. MIN	C-STEEL
		19	S		IC-BOLT	SEE NOTE 3	MILD STEEL OR STRONGER
		20	S		IC-NUT	3/8 DIA MIN	MILD STEEL OR STRONGER
		21			IC-PRESSURE VACUUM RELIEF VALVE		
		22			IC- SPACER BLOCK		WOOD/PLASTIC/METAL
		23			IC-PRODUCT POSITIONING PADS	OPTIONAL	RUBBER
		24			IC-SPACER BLOCK PAD	OPTIONAL	
		25			END CAP GASKET		RUBBER
		26	S		LID END CAP	16 GA MIN	C-STEEL



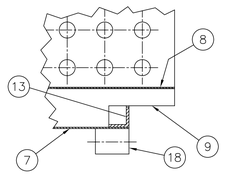
INNER SHIPPING CONTAINER ASSY



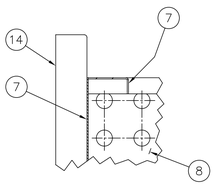
INNER CONTAINER BASE



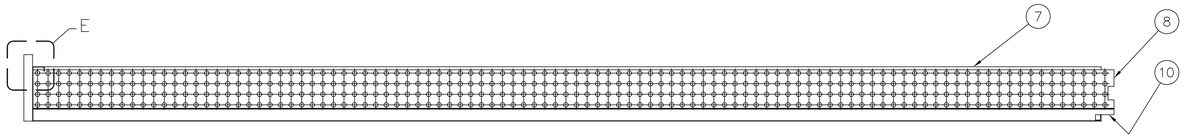
PARTIAL VIEW B-B
SCALE: 1/4



DETAIL D
SCALE: 1/4



DETAIL E
SCALE: 1/4



SECTION C-C

SD752331/NCSC
D ECN 61214-0
ITT CHANGE
752558
ECN 0000271-1
SEE ECN FOR CHANGES
C. LAWSON
05-05-06

SEE PRODUCT SPECIFICATION PDINF000 FOR SUPPLEMENTAL PRODUCT INFORMATION

DWG REF
NEXT ASSY
THIRD ANGLE PROJECTION

DFTM	C. LAWSON	07/23/04
CHKD	B. JONES	07/23/04
DES ENG	B. E. HEMPY	05/25/04
MFG ENG	S. PALMER	06/30/04
PA ENG	J. COILE	06/30/04
DES ENG MGR	B. HERWIG	07/06/04
APPD	G. SUMMERS	06/29/04
APPD	T. LOIGNON	06/30/04
APPD		

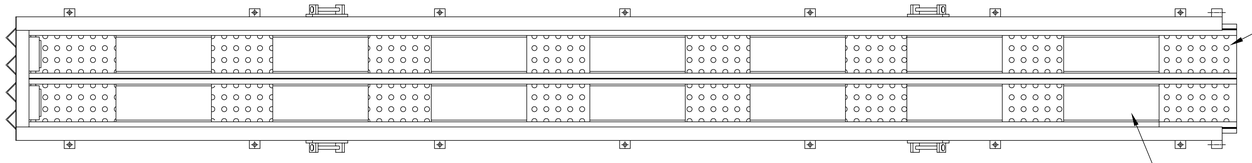
Westinghouse ELECTRIC COMPANY LLC - NUCLEAR FUEL COLUMBIA, SC USA

PATRIOT BWR
INNER SHIPPING PACKAGE AND SAFETY ITEMS

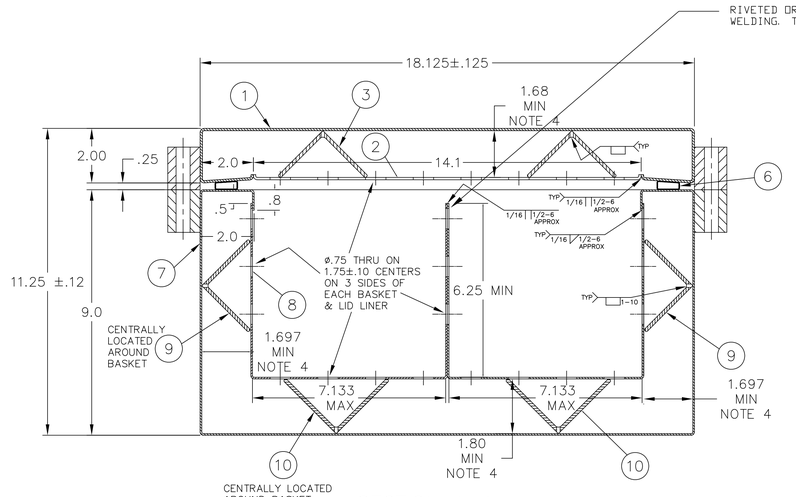
SIZE | FSCM NO | DWG NO 10014E28 | REV 2
SCALE | WEIGHT(LBS) | SHEET 1 OF 2 SHEETS

DIMENSIONS IN INCHES

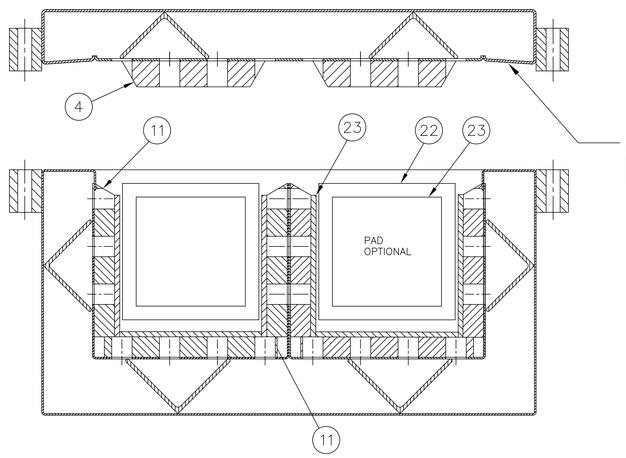
CADAM DRAWING DO NOT REVISE MANUALLY



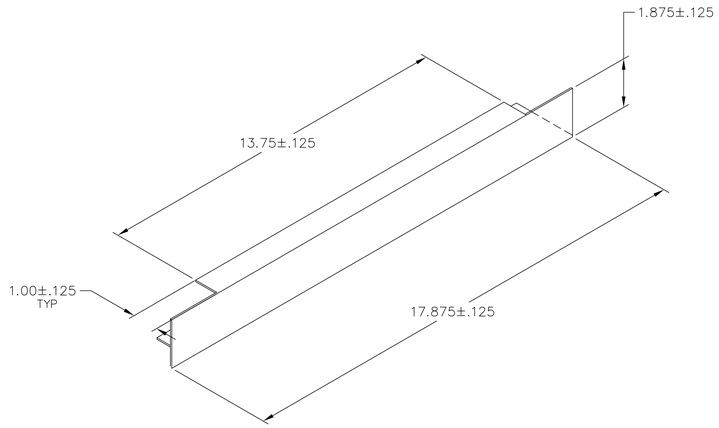
INNER SHIPPING CONTAINER ETHAFOAM & LINER INSTALLATION



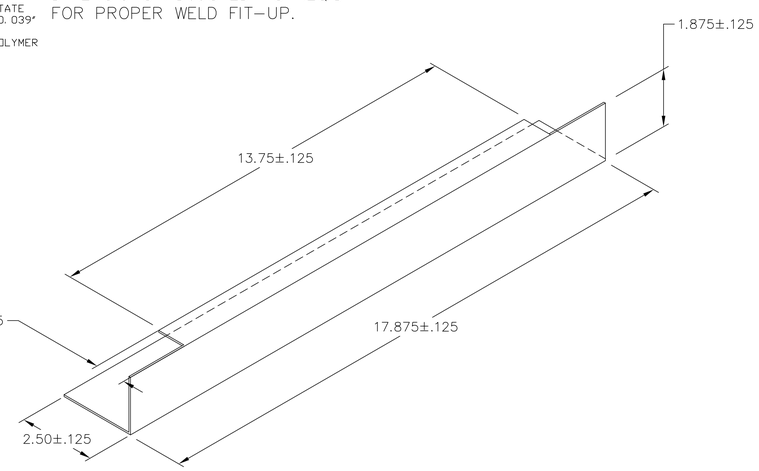
SECTION A–A SHT 1
(OPTIONAL PADDING NOT SHOWN)
SCALE: 1/4



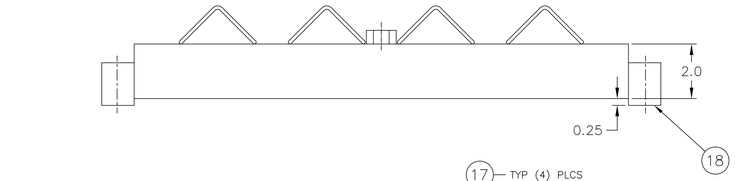
SECTION F–F
SCALE: 1/4

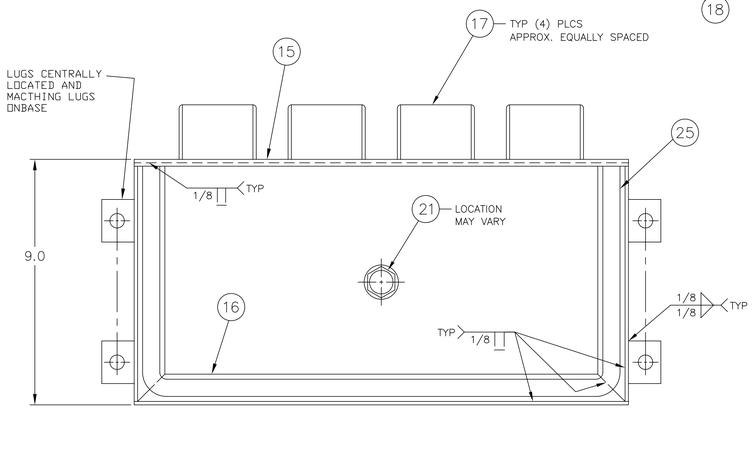


DETAIL G – OPTIONAL LID END CAP
SCALE: 1/4
DIMENSIONS ADJUSTED AS REQ'D FOR PROPER WELD FIT–UP.

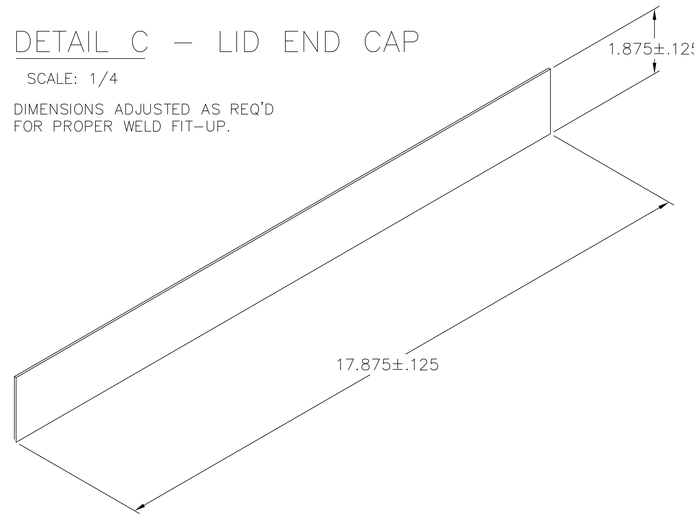


DETAIL C – LID END CAP
SCALE: 1/4
DIMENSIONS ADJUSTED AS REQ'D FOR PROPER WELD FIT–UP.





INNER END COVER ASSY
SCALE: 1/4



DETAIL F – OPTIONAL LID END CAP
SCALE: 1/4
DIMENSIONS ADJUSTED AS REQ'D FOR PROPER WELD FIT–UP.

SD 752331
D 0000080-0
IT CHANGE 2
752558
ECN 0000271-1
SEE ECN FOR CHANGES
C. LAWSON 04/05/06

SEE PRODUCT SPECIFICATION PDINF000 FOR SUPPLEMENTAL PRODUCT INFORMATION

DWG REF
NEXT ASSY
THIRD ANGLE PROJECTION

DFTM	CANTRELL	8/31/05
CHKD	N. PRESTO	8/31/05
DES ENG	B. HEMPY	8/15/05
MFG ENG	S. PALMER	8/22/05
PA ENG	T. BROWN	8/19/05
DES ENG MGR	M. DYE	8/22/05
APPD	N. KENT	8/16/05
APPD	G. SUMMERS	8/17/05
APPD	J. HALLIGAN	8/18/05

Westinghouse ELECTRIC COMPANY LLC - NUCLEAR FUEL COLUMBIA, SC USA

OPTIONAL PATRIOT BWR INNER SHIPPING PACKAGE AND SAFETY ITEMS

SIZE | FSCM NO | DWG NO 10015E58 | REV 2
SCALE | WEIGHT(LBS) | SHEET 2 OF 2 SHEETS
DIMENSIONS IN INCHES

CADAM DRAWING DO NOT REVISE MANUALLY

Westinghouse Electric Company, LLC
Columbia Fuel Fabrication Plant
Columbia, SC

Application for Certificate of Compliance for the Patriot BWR Fuel Shipping Package

NRC Certificate of Compliance
USA/9292/AF-85
Docket 71-9292

Initial Submittal:	September 2004
Revision 1:	April 2005
Revision 2:	June 2005
Revision 3:	September 2005
Revision 4:	January 2006
Revision 4:	May 2006

Westinghouse Electric Company LLC
Nuclear Fuel
4350 Northern Pike
Monroeville, PA 15146