

71-9274



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Your ref: NRC TAC No. L23611  
Our ref: NFT-NRC-03-010

November 21, 2003

Subject: Response to NRC Request for Additional Information for Docket #71-9274 dated September 3 2003  
Reference: (1) NRC Request for Additional Information (RAI) TAC#L23611 dated September 3, 2003

Mrs. Osgood:

Westinghouse Electric Co. hereby provides its response to your request for additional information contained in reference (1). A summary page is included to indicate where the RAI changes are to be found.

Attached please find revised sections to the License Application identified as Revision 4. These sections are:

- Table of Contents Section,
- License drawings,
- Section 7, OPERATING PROCEDURES,
- Section 8, ACCEPTANCE TESTS AND MAINTENANCE PROGRAM.

WESTINGHOUSE ELECTRIC COMPANY, LLC

Norman A. Kent

Norman A. Kent  
Manager Licensing and Regulatory Compliance  
Nuclear Material Supply

A BNFL Group company

NM9501

Enclosure 1

Response to Request for Additional Information  
Docket 71-9274  
Model ABB-2901 Package

RAI Items 1-1, 1-2, 1-3

Appendix 1A

- Drawing 10004E01 revised to:
  - Correct typographical errors incurred when converting L-9274-01 to 10004E01.
  - Remove "proprietary" blocks.
- Drawing 10004E02 sheet 1 of 2 revised to:
  - Include materials of construction and bolt torque information for the new retention clamps.
  - Remove "proprietary" blocks.
- Drawing 10004E02 sheet 2 of 2 revised to rev. 2 to:
  - Include tolerance notes.
  - Remove "proprietary" blocks.
- Drawing 10004E03 revised to:
  - Remove "proprietary" blocks

RAI Item 7-1

Section 7

- Revised to Rev. 4 to incorporate information regarding pre-shipment inspections that are used to ensure that the package is undamaged and properly prepared for transport.

RAI Items 8-1, 8-2

Section 8

- Revised to clarify that each packaging must be constructed in accordance with the drawings referenced in the Certificate of Compliance.
- Revised to describe the maintenance program for the ABB-2901.

**WESTINGHOUSE ELECTRIC COMPANY LLC  
NUCLEAR FUEL**

**APPLICATION FOR APPROVAL  
OF PACKAGING OF  
FISSILE RADIOACTIVE MATERIAL  
(ABB-2901 SHIPPING PACKAGE)**

**PACKAGE IDENTIFICATION NUMBER  
USA/9274/AF**

**Initial Submittal: April 8, 1997  
Revision 3: February 28, 2003  
Revision 4: November 21, 2003  
Expiration: September 30, 2007**

**U. S. NUCLEAR REGULATORY COMMISSION**

**DOCKET 71-9274**

# Westinghouse Electric Company

## ABB-2901 Shipping Package

Certificate of Compliance No. 9274

NRC Docket No. 71- 9274

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### List of Effective Revisions

CHAPTER	REVISION	EFFECTIVE DATE
TOC	4	21-Nov-03
1	3	28-Feb-03
Appendix 1A	4	21-Nov-03
2	3	28-Feb-03
Appendix 2A	3	28-Feb-03
Appendix 2B	3	28-Feb-03
Appendix 2C	3	28-Feb-03
Appendix 2D	3	28-Feb-03
3	3	28-Feb-03
4	3	28-Feb-03
5	3	28-Feb-03
6	3	28-Feb-03
7	4	21-Nov-03
8	4	21-Nov-03

### Revision Submittal Record

Submittal Date	Reason	NRC Certificate	DOT Certificate (Corresponding NRC CoC)
28 FEB 03	<p>License Renewal. All sections set to Revision 3</p> <p>Entire document changed to revision 3 because in Header changed to Westinghouse Electric Company.</p> <p>The following technical changes were made: Appendix 1A</p> <ul style="list-style-type: none"><li>▪ Drawing L-9274-01 renamed 10004E01 and revised to include retention clamps. Changed to Rev.1</li><li>▪ Drawing L-9274-02 renamed 10004E02 and revised to include retention clamps. Also revised to reflect only 2 sheets instead of 3.Changed to Rev.1</li><li>▪ Drawing L9274-03 renamed 10004E03.</li></ul> <p>Section 2.0 STRUCTURAL EVALUATION</p> <ul style="list-style-type: none"><li>▪ Paragraph added to introduce the recent</li></ul>		

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Submittal Date	Reason	NRC Certificate	DOT Certificate (Corresponding NRC CoC)
	<p>HAC testing performed in response to NRC Confirmatory Action Letter No. 02-8-002 dated June 20 2002.</p> <p>Section 2.4.2 POSITIVE CLOSURE</p> <ul style="list-style-type: none"><li>Retention clamps added.</li></ul> <p>Section 2.7.1 HAC FREE DROP</p> <ul style="list-style-type: none"><li>Reference made to recent tests in Appendix 2D.</li></ul> <p>Section 2.7.3 HAC PUNCTURE (PINNACLE TEST)</p> <ul style="list-style-type: none"><li>Reference made to recent tests in Appendix 2D.</li></ul> <p>Appendix 2A</p> <ul style="list-style-type: none"><li>No new information</li><li>Renumbered for consistency with document</li></ul> <p>Appendix 2B</p> <ul style="list-style-type: none"><li>No new information</li><li>Renumbered for consistency with document</li></ul> <p>Appendix 2C:</p> <ul style="list-style-type: none"><li>No new information</li><li>The section was renamed from "Appendix" to "Appendix 2C" for consistency with document.</li></ul> <p>Appendix 2D: Results of Modified ABB-2901 Package Verification Drop Test</p> <ul style="list-style-type: none"><li>New section describing recent testing done in response to NRC CAL.</li></ul> <p>Section 4.3: CONTAINMENT REQUIREMENTS FOR HYPOTHETICAL ACCIDENT CONDITIONS</p> <ul style="list-style-type: none"><li>Added reference to recent testing.</li></ul> <p>Section 7.1 PROCEDURES FOR LOADING THE SHIPPING PACKAGE</p> <ul style="list-style-type: none"><li>Added provision for installing retention clamps.</li></ul> <p>Section 7.2: PROCEDURES FOR UNLOADING THE SHIPPING PACKAGE</p>		

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Submittal Date	Reason	NRC Certificate	DOT Certificate (Corresponding NRC CoC)
	<ul style="list-style-type: none"><li>Added provision for removing retention clamps.</li></ul>		
21 NOV 03	<p>Revision 4. Response to NRC RAI TAC L23611 dated 03SEP03.</p> <p>Appendix 1A</p> <ul style="list-style-type: none"><li>Drawing 10004E01 revised to Rev. 2 to:<ul style="list-style-type: none"><li>Correct typographical errors incurred when converting L-9274-01 to 10004E01.</li><li>Remove "proprietary" blocks.</li></ul></li><li>Drawing 10004E02 sheet 1 of 2 revised to rev. 2 to:<ul style="list-style-type: none"><li>Include materials of construction and bolt torque information for the new retention clamps.</li><li>Remove "proprietary" blocks.</li></ul></li><li>Drawing 10004E02 sheet 2 of 2 revised to rev. 2 to:<ul style="list-style-type: none"><li>Include tolerance notes.</li><li>Remove "proprietary" blocks.</li></ul></li><li>Drawing 10004E03 revised to Rev. 2 to:<ul style="list-style-type: none"><li>Remove "proprietary" blocks.</li></ul></li></ul> <p>Section 7</p> <ul style="list-style-type: none"><li>Revised to Rev. 4 to incorporate response to RAI comments in 7-1.</li></ul> <p>Section 8</p> <ul style="list-style-type: none"><li>Revised to Rev. 4 to incorporate response to RAI comments in 8-1 and 8-2.</li></ul>		



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### Appendix 1A: Engineering Drawings

Details of construction and assembly for the ABB-2901 shipping package are shown on the following licensing drawings:

<u>Drawing No.</u>	<u>Revision</u>	<u>Title</u>	
10004E01	2	ABB 2901 Shipping Drum for Pellets Assembly & Details	
10004E02	2	ABB 2901 Shipping Arrangement Using Corrugated Trays (2 Sheets)	
10004E03	2	Corrugated Tray	

# **Westinghouse Electric Company**

## **ABB-2901 Shipping Package**

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10004E01

Rev. 2

ABB 2901 Shipping Drum for pellets, Assembly and Details

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10004E02, Rev. 2    ABB-2901 Shipping Arrangement Using Corrugated Trays    Sheet 1    |

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10004E03, Rev. 2    ABB-2901 Shipping Arrangement Using Corrugated Trays    Sheet 2    |

|

**FIGURE WITHHELD UNDER 10 CFR 2.390**

**FIGURE WITHHELD UNDER 10 CFR 2.390**

**FIGURE WITHHELD UNDER 10 CFR 2.390**

**FIGURE WITHHELD UNDER 10 CFR 2.390**



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## ABB-2901 Shipping Package

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### 7.0 OPERATING PROCEDURES

Uranium dioxide ( $\text{UO}_2$ ) fuel pellets are shipped in the ABB-2901 shipping package. Loading and unloading of the shipping package are relatively simple, straight forward operations. However, to ensure proper and safe packaging of the special nuclear material to be transported, detailed manufacturing facility procedures are employed when executing these operations. The following general description provides a brief overview of the detailed procedures.

#### 7.1 Procedures for Loading the Shipping Package

Pellet trays are filled and transferred to a scale area where the pellet material weight is determined by measurement and adjusted to be within the loading limit of 227 pounds of pellets (103 kgs) as listed in Section 1.2.3. From the scale area, the pellet trays are brought to the loading area or they are placed in storage to await shipment.

Prior to loading special nuclear material into the shipping package, its ring clamp, drum retention clamp, outer drum lid, circular wooden top spacer, inner compartment cover and cover gasket are removed. The outer shell of the steel drum is visually inspected to assure that there are no holes or tears. The shipping pallet, upon which the shipping packages rest, is also inspected to assure it is in reasonable condition prior to use (i.e., no bent legs, straps are in place, etc.). Once the shipping package and shipping pallet are determined to be acceptable for use, the corrugated pellet tray boxes of new fuel pellets can be loaded.

Initially, the first loading step is to place a wooden spacer block in the bottom of the inner container. This is followed by the insertion of the heavy steel shelved insert. Although it is removable, the shelved insert is not intended to be removed and inserted on a continuous basis due to its weight. Therefore, following initial assembly, this step only needs to be repeated if the insert has been removed.

The shelved insert contains four locations which accommodate the corrugated pellet tray boxes. Each of the four boxes is filled with up to eight corrugated pellet trays depending on the type (i.e., diameter) of fuel pellet being shipped. An empty corrugated tray is used over the top layer of fuel pellets as a cover for the stack of pellet trays. A piece of compressible rubber material approximately the size of a corrugated tray is placed on top of the uppermost tray and the box lid is attached to the pellet box. The thickness of the rubber material is listed on the engineering drawings in Appendix 1A.

Four corrugated tray pellet boxes are placed into a steel insert. If fewer than the total number of trays for each pellet diameter are to be shipped in a box, then the void left by any missing trays shall be filled with wood spacers. If there is insufficient material to fill all four locations per insert, for structural reasons, an empty box filled with a wood spacer must occupy the unused locations.

After loading of the four corrugated tray boxes into the steel insert is complete, an additional wood spacer block is inserted which occupies the remaining volume within the inner compartment. Before installing the inner compartment cover gasket, the gasket is inspected for acceptability and replaced if necessary. The inner compartment cover gasket and cover are

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## ABB-2901 Shipping Package

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installed, secured with nuts torqued to  $35\pm 5$  ft-lb. Following this the circular wooden top spacer, lid, and the ring clamp are installed by tightening the ring clamp to  $75\pm 5$  ft-lb. Three (3) drum retention clamps are then installed by visually positioning the clamps approximately  $120^\circ$  apart. Each clamp is tightened until both clamp surfaces are visually seated against the drum surfaces.

The outside surface of the shipping package is smeared and surveyed. Finally, the shipping package is appropriately labeled, a tamper-proof seal is applied, and the shipping package is removed to a storage area to await shipment or it is loaded directly on the transport vehicle, as appropriate.

The ABB-2901 shipping package is loaded, unloaded and transported in a horizontal orientation.

### 7.2 Procedures for Unloading the Shipping Package

Unloading the ABB-2901 shipping package is, for the most part, simply a reversal of the loading process described above. Upon arrival, the shipping packages are inspected for potential shipping or handling damage and to verify the integrity of the tamper-proof seal. If the container is found to be damaged and/or the seal has been tampered with, manufacturing facility management is informed. Following initial external receipt inspection, the ABB-2901 shipping packages, on their shipping pallet, are brought into the area of the manufacturing facility where they are to be unloaded.

Once located in the unloading area, the three drum retention clamps, the ring clamp, outer drum lid, circular wooden top spacer, the inner compartment cover, and gasket are removed from the shipping package. The individual corrugated pellet tray boxes are extracted by removing the two front screws and threading on the appropriate handling tool. The individual corrugated trays of pellets are accessed via complete removal of the screwed down cover. The corrugated trays are transferred to a receiving scale station and inspected. After completing receipt inspection, the fuel pellets are transferred to a storage area or they are introduced directly into the manufacturing process, as appropriate.

Once the ABB-2901 shipping package has been unloaded, the packaging material is replaced and the inner compartment cover is secured, the outer drum lid is secured with the ring clamp and three drum retention clamps, and an "EMPTY" notice is attached to the outside of the shipping package. The empty shipping packages are then decontaminated, if necessary, and moved to a transport vehicle or to a storage area to await return to the fuel vendor, as appropriate.

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## **ABB-2901 Shipping Package**

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### **8.0 ACCEPTANCE TESTS AND MAINTENANCE PROGRAM**

#### **8.1 Acceptance Tests**

The ABB-2901 shipping package will be fabricated in accordance with approved drawings referenced in the NRC Certificate of Compliance. Any changes in design which fall outside of the safety envelope specified in the Certificate of Compliance will be submitted to the Nuclear Regulatory Commission for approval prior to being implemented.

The outer shell of each shipping package shall be conspicuously and durably marked with the package model number, gross weight, and the package identification number assigned by the Nuclear Regulatory Commission.

#### **8.2 Maintenance Program**

Repair and maintenance are also performed in accordance with approved drawings and specifications. The ABB-2901 shipping package has no moving parts which require periodic maintenance. Any unacceptable condition discovered during these operations is noted and the shipping package appropriately tagged for maintenance.

Periodic maintenance shall also be performed on selected packages, typically based on age. The maintenance activity will cover both external and internal components. Prior to commencing the maintenance inspection, package items to be inspected and the acceptance criteria for them will be documented. The external inspection will include the general condition of the drum as well as the drum lid and retention clamp hardware inspections. The internal inspection will include items such as plywood, hardboard, insulating material, welds, critical dimensions, and inserts. Repair/refurbishment will be required on packages whose inspection results warrant such work. The need to inspect additional packages will be determined from inspection results. Packages that are found to be in non-conformance will be removed from service until they are reworked and verified to be suitable for use.