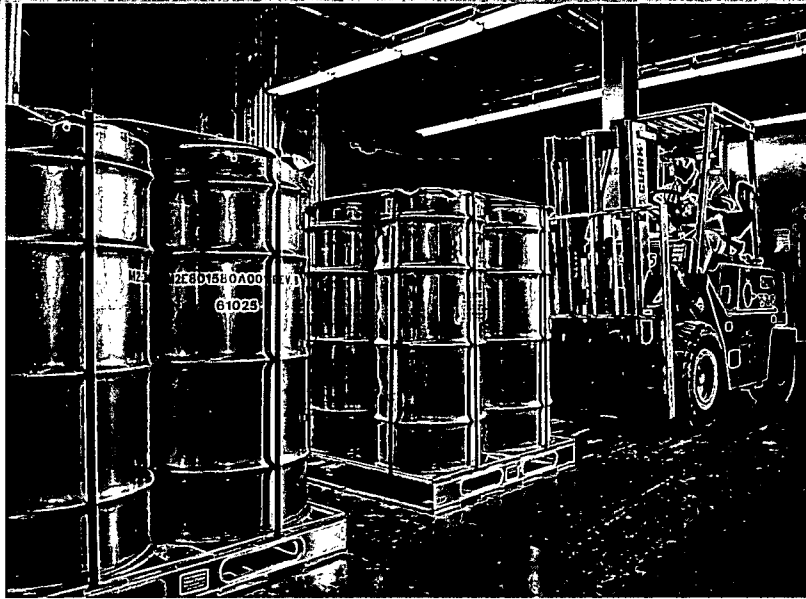


# ES-3100 Shipping Package

## Docket 71-9315



**Certificate: USA/9315/B(U)F-96**

**Holder: U.S. Department of Energy**

*Public meeting date: January 29, 2008*

*U.S. Nuclear Regulatory Commission*

*Rockville, Maryland*



## Meeting Topic

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- **Emergency amendment to the ES-3100 CoC for a necessary shipment under the Foreign Research Reactor (FRR) Program**

# Meeting objectives

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- **Validate need for emergency amendment**
- **Describe new contents**
- **Describe approach to safety analysis**
- **Show affected pages of SAR**
- **Discuss submittal of request and schedule**

# Emergency Amendment

- **FRR needs to make a shipment from UK to USA**
- **Shipment is within the scope of the Global Threat Reduction Initiative (GTRI), thus supports national security**
- **Window of opportunity is June 2008**
- **Shipment required by air in ES-3100**
- **Contents are unirradiated research reactor fuel-related items with low fissile content**
- **Approved CoC required by April 15, 2008 in order to allow UK DOT to approve shipment by June**

# GTRI Contents Description

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- **Contents include research reactor fuel elements or fuel components, broken metal, broken U-Al alloy, and oxides**
  
- **Contents are described in 2 groups**

# GTRI Group 1 Contents

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- **Research reactor fuel elements or fuel components composed of U-Al,  $U_3O_8$ -Al,  $UO_2$ , or  $UO_2$ -Mg**
  - **Fuel elements consist of multiple fuel components in the form of plates, rods, and tubes clad in aluminum, stainless steel, or zircalloy and held together as a single unit by inert structural components**
  - **Fuel components are individual plates, rods, or tubes removed from fuel elements**

# GTRI Group 2 Contents

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- Broken uranium metal, broken U-Al alloy, and oxides ( $U_3O_8$ -Al,  $U_3O_8$ ,  $UO_2$ , or  $UO_2$ -Mg)

# GTRI Content Configurations

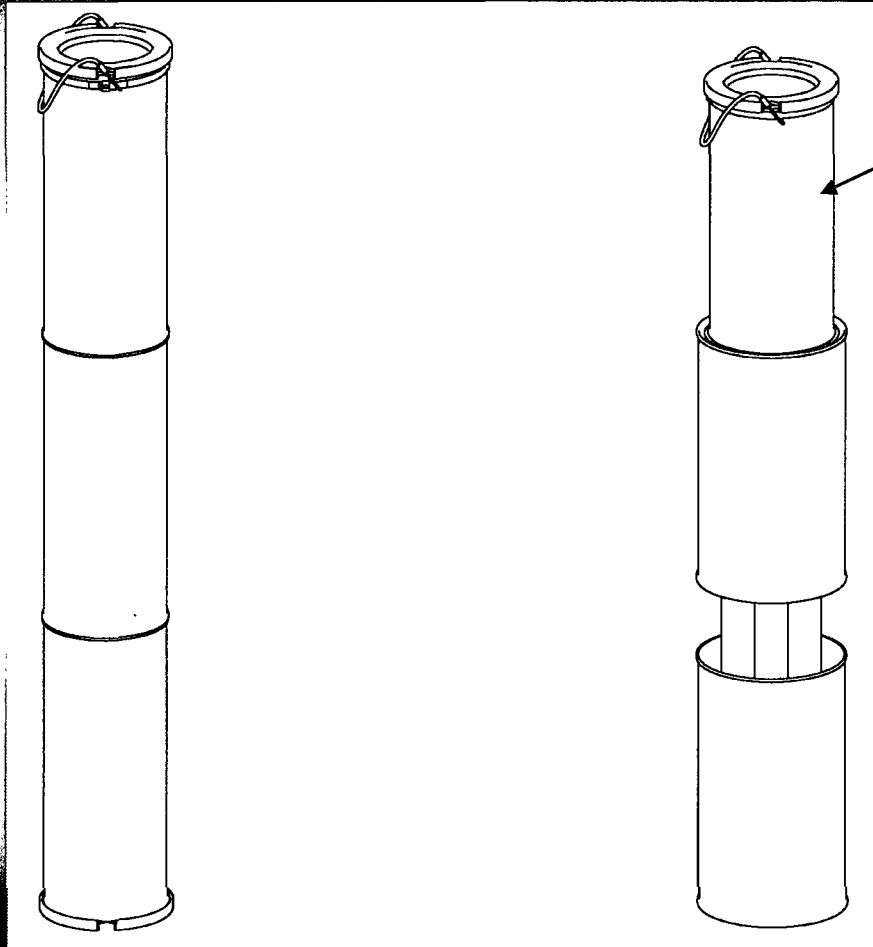
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- **Group 1 - bundled together and placed inside a modified convenience can [a 17.5-in.-tall can (two 8.75-in.-tall cans brazed together) or a 30-in.-tall can (three 10-in.-tall cans brazed together)] or protected on each end with an open-ended convenience can constructed of stainless steel, tinned-carbon steel, or nickel alloy**
- **Group 2 - (with the exception of  $\text{UO}_2\text{-Mg}$ ) will be shipped in tinned-carbon steel, stainless steel, or nickel-alloy convenience cans. Oxide in the form of  $\text{UO}_2\text{-Mg}$  will be shipped in glass bottles placed inside a metal convenience can**



# New Can Configurations

Long can  
3 – 10 inch cans  
brazed together



Empty can  
as spacer

Open can  
Open ended cans  
forming end caps for fuel  
elements or parts

# Safety Analysis Approach

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- Safety based on results of analyses for approved TRIGA fuel for air transport
- Criticality safety analyst summed up the impact as follows:
  - GTRI items of uranium broken metal or U-Al alloy may be packaged for air transport under limits specified in Table 6.2b [air transport table] for solid HEU metal of specified geometric shapes. These items will be packed to a maximum of 700 g  $^{235}\text{U}$  at any enrichment per ES-3100 package
  - GTRI items of  $\text{U}_3\text{O}_8$ ,  $\text{U}_3\text{O}_8\text{-Al}$ ,  $\text{UO}_2$ , and  $\text{UO}_2\text{-Mg}$  may be packaged for air transport under limits specified in Table 6.2b for unirradiated TRIGA fuel elements. Per package limits for these items are a maximum of 716 g  $^{235}\text{U}$  at enrichments not exceeding 20 wt% and a maximum of 408 g  $^{235}\text{U}$  for content enrichments greater than 20 wt%

# Requested Fissile Mass Per Package

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- **Group 1 - Fuel elements, fuel components, and broken metal or U-Al alloy**
  - maximum of 700 g  $^{235}\text{U}$  at any enrichment
- **Group 2 - Oxides ( $\text{U}_3\text{O}_8$ ,  $\text{U}_3\text{O}_8\text{-Al}$ ,  $\text{UO}_2$ , and  $\text{UO}_2\text{-Mg}$ )**
  - maximum of 700 g  $^{235}\text{U}$  at enrichments not exceeding 20 wt %
  - maximum of 408 g  $^{235}\text{U}$  for enrichments greater than 20 wt %

# Other Safety Aspects

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- **Structural – no impact**
- **Internal pressure – no impact**
- **Thermal – no impact**
- **Containment – no impact**
- **Shielding – no impact**

# SAR Page Changes

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- **Administrative changes in Rev 2 of SAR**
  - Needed to integrate all previous change page editions of Rev 1
  - Not relevant to GTRI contents
  
- **Addition of the GTRI contents – refer to hand-out of draft SAR pages**

# Amendment Format

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- **Cover letter emphasizing the importance of this amendment to the FRR program and national security**
- **Complete SAR, Revision 2 (10 copies)**
- **Mark-up of CoC, Revision 6**

# Amendment Schedule

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- **Submittal planned for February 11**
- **Hand delivered or FedEx**
- **Request approved CoC revision by April 15**