



## Department of Energy

Washington, DC 20585

AUG 14 2003

### **SAFETY EVALUATION REPORT** for Revision 15 of the Safety Analysis Report for Packaging for the 9975 Package

Docket 03-13-9975

#### **Chapter 1: General Information**

This Safety Evaluation Report (SER) covers the staff's findings regarding the review of the 9975 Safety Analysis Report for Packaging (SARP) Revision 15 (References 1 and 2). This section of the SER covers the review of the General Information provided in Chapter 1 of the SARP. Specifically, the review encompassed:

- Adding the Hanford 3013 Convenience Can configuration as authorized contents, per Figure 1.11(k) of the SARP; and
- Increasing the height of the Primary Containment Vessel (PCV) bottom honeycomb spacer, per Figure 1.11(j), and Revision 7 of Drawing R-R4-F-0054, of the SARP. However, per a proposal from the DOE Savannah River Operations Office (SR) to the Office of Safety and Engineering (EM-5) (E-mail, Jeffrey Allison, SR, to Sandra Johnson, EM-5, "Re: 9975 Package Fabrication Issues," dated August 5, 2003), this configuration has been withdrawn from consideration and will not be authorized in the revised Certificate of Compliance.

The review also encompassed the requested removal of the following loading configurations as authorized contents, both of which were previously allowed contents under earlier versions of the SARP:

- The Aries Convenience Can inside a 3013 can configuration, and
- The Savannah River Site (SRS) Convenience Can inside the SRS Bagless Transfer Can inside a 3013 can configuration.

Finally, the review also encompassed the requested removal of the Lawrence Livermore National Laboratory (LLNL) Hex Can configuration from consideration as an allowable content configuration. Earlier reviews of the LLNL Hex Can configuration had not been completed. As a result, the LLNL Hex Can configuration was not part of the previously authorized contents.

The results of the transport safety assessment of each proposed change are discussed below.



#### Addition of the Hanford 3013 Convenience Can Configuration

The Hanford 3013 Convenience Can configuration, per Figure 1.11(k) of the SARP, has been analyzed in a manner that was similar to that used for previously analyzed 3013 Can configurations. Due to the similarity with other previously authorized content configurations, no unusual effects on the PCV were expected or found.

#### Alternate Thick Honeycomb Spacer Configuration

As mentioned previously, this configuration has been withdrawn from consideration and will not be authorized in the revised Certificate of Compliance.

#### Elimination of Loading Configurations as Previously Authorized Contents

A variety of reviews and analyses had previously been conducted on the use of the following authorized content configurations:

- The Aries Convenience Can inside a 3013 can configuration, and
- The SRS Convenience Can inside the SRS Bagless Transfer Can inside a 3013 can configuration.

Since the elimination of previously authorized content configurations has no effect on the overall safety basis of the 9975 packaging, no unusual effects on the packaging were expected or found.

#### Elimination of a Proposed Content Configuration from Further Consideration

The LLNL Hex Can configuration had been under consideration as a proposed content configuration under an earlier version of the SARP. Since this particular content configuration has now been removed from further consideration as an allowable content configuration, this request has no effect on the overall safety basis of the 9975 packaging.

### **Findings**

Based on the review of the statements and representations in the SARP and the application, it has been concluded that the package design has been adequately described to meet the requirements of 10 CFR Part 71.

### **Conditions of Approval**

Conditions of approval for this request are discussed in Chapter 7, below.

### **Chapter 2: Structural Evaluation**

This SER covers the reviewers findings regarding the review of Revision 15 of the 9975 SARP (References 1 and 2). This section covers the assessment of the Structural Evaluation information provided in Chapter 2 of the SARP.

A summary of the items reviewed are listed above in the introduction to Chapter 1. The results of the review are discussed below.

#### Addition of the Hanford 3013 Convenience Can Configuration

The Hanford 3013 Convenience Can configuration, per Figure 1.11(k) of the SARP, has been analyzed in a manner that was similar to that used for previously analyzed 3013 Can configurations. Due to similarities in geometry and mass with other previously authorized content configurations, no unusual effects on the structural integrity of the PCV or other packaging components were expected or found.

#### Alternate Thick Honeycomb Spacer Configuration

As mentioned previously, this configuration has been withdrawn from consideration and will not be authorized in the revised Certificate of Compliance.

#### Elimination of Loading Configurations as Previously Authorized Contents

A variety of reviews and analyses had previously been conducted on the use of the following authorized content configurations:

- The Aries Convenience Can inside a 3013 can configuration, and
- The SRS Convenience Can inside the SRS Bagless Transfer Can inside a 3013 can configuration.

Since the elimination of previously authorized content configurations has no effect on the overall structural integrity of the 9975 packaging, the elimination is acceptable.

#### Elimination of a Proposed Content Configuration from Further Consideration

The LLNL Hex Can configuration had been under consideration as a proposed content configuration under an earlier version of the SARP. Since the inclusion of this particular content configuration has now been removed from further consideration as an allowable content configuration, this review report does not have an assessment of the possible effects of the LLNL Hex Can on the structural integrity of the 9975 packaging.

#### **Findings**

Based on the review of the statements and representations in the SARP and the application, the reviewers have concluded that the structural design of the additional content configurations has been adequately described. The reviewers have also concluded that the possible effects of the additional content configurations on the structural integrity of the 9975 packaging has been properly evaluated in accordance with the requirements of 10 CFR Part 71.

#### **Conditions of Approval**

Conditions of approval for this request are discussed in Chapter 7, below.

### **Chapter 3: Thermal Evaluation**

This SER covers the reviewers findings regarding the review of Revision 15 of the 9975 SARP (References 1 and 2). This section covers the review of the Thermal Evaluation information provided in Chapter 3 of the SARP.

Details of the items reviewed are listed above in the introduction to Chapter 1. The results of the review are discussed below.

#### Addition of the Hanford 3013 Convenience Can Configuration

The similarity of the Hanford 3013 Convenience Can configuration to previously authorized content configurations results in no unusual thermal behavior from the previously considered content configuration.

#### Alternate Thick Honeycomb Spacer Configuration

As mentioned previously, this configuration has been withdrawn from consideration and will not be authorized in the revised Certificate of Compliance.

#### Elimination of Loading Configurations as Previously Authorized Contents

A variety of reviews and analyses had previously been conducted on the use of the following authorized content configurations:

- The Aries Convenience Can inside a 3013 can configuration, and
- The SRS Convenience Can inside the SRS Bagless Transfer Can inside a 3013 can configuration.

Since the elimination of previously authorized content configurations has no effect on the overall safety basis of the 9975 packaging, no unusual effects on the packaging were expected or found.

#### Elimination of a Proposed Content Configuration from Further Consideration

The request for the removal of the LLNL Hex Can configuration request has no effect on the overall safety basis of the 9975 packaging.

### **Findings**

Based on the review of the statements and representations in the SARP and the application, the reviewers have concluded that the package design has been adequately described to meet the requirements of 10 CFR Part 71.

### **Conditions of Approval**

The maximum heat loading for the package shall not exceed 19 watts, which is already specified in the current Certificate of Compliance (Reference 3). Other conditions of approval for this request are discussed in Chapter 7, below.

### **Chapter 4: Containment**

This SER covers the reviewers findings regarding the review of Revision 15 of the 9975 SARP (References 1 and 2). This section covers the review of the Containment information provided in Chapter 4 of the SARP.

Details of the items reviewed are listed above in the introduction to Chapter 1. The results of the review are discussed below.

#### Addition of the Hanford 3013 Convenience Can Configuration

There are no containment-related issues associated with the addition of the Hanford 3013 Convenience Can configuration.

#### Alternate Thick Honeycomb Spacer Configuration

As mentioned previously, this configuration has been withdrawn from consideration and will not be authorized in the revised Certificate of Compliance.

#### Elimination of Loading Configurations as Previously Authorized Contents

There are no containment-related issues associated with the elimination of previously authorized contents.

#### Elimination of a Proposed Content Configuration from Further Consideration

There are no containment-related issues associated with the elimination of a previously proposed content configuration.

### **Findings**

Based on the review of the statements and representations in the SARP and the application, the reviewers have concluded that the package design has been adequately described to meet the requirements of 10 CFR Part 71.

### **Conditions of Approval**

Conditions of approval for this request are discussed in Chapter 7, below.

## **Chapter 5: Shielding Evaluation**

This SER covers the reviewers findings regarding the review of Revision 15 of the 9975 SARP (References 1 and 2). This section covers the review of the Shielding Evaluation information provided in Chapter 5 of the SARP.

Details of the items reviewed are listed above in the introduction to Chapter 1. The results of the review are discussed below.

### Addition of the Hanford 3013 Convenience Can Configuration

The Hanford 3013 Convenience Can configuration, per Figure 1.11(k) of the SARP, has been analyzed in a manner that was similar to that used for previously analyzed 3013 Can configurations. Due to the similarity with other previously authorized content configurations, no adverse effects on the shielding design of the packaging were expected or found.

### Alternate Thick Honeycomb Spacer Configuration

As mentioned previously, this configuration has been withdrawn from consideration and will not be authorized in the revised Certificate of Compliance.

### Elimination of Loading Configurations as Previously Allowed Contents

A variety of reviews and analyses had previously been conducted on the use of the following authorized content configurations:

- The Aries Convenience Can inside a 3013 can configuration, and
- The SRS Convenience Can inside the SRS Bagless Transfer Can inside a 3013 can configuration.

Since the elimination of previously authorized content configurations has no effect on the overall safety basis of the 9975 packaging, no adverse effects on the shielding design of the packaging were expected or found.

### Elimination of a Proposed Content Configuration from Further Consideration

The LLNL Hex Can configuration had been under consideration as a proposed content configuration under an earlier version of the SARP. Since this particular content configuration has now been removed from further consideration as an allowable content configuration, this request has no effect on the overall safety basis of the 9975 packaging.

## **Findings**

Based on the review of the statements and representations in the SARP and the application, the staff has concluded that the shielding design has been adequately described and evaluated and that the package meets the external radiation requirements of 10 CFR Part 71.

## **Conditions of Approval**

Conditions of approval for this request are discussed in Chapter 7, below.

## **Chapter 6: Criticality Evaluation**

This SER covers the reviewers findings regarding the review of Revision 15 of the 9975 SARP (References 1 and 2). This section covers the review of the Criticality Evaluation information provided in Chapter 6 of the SARP.

Details of the items reviewed are listed above in the introduction to Chapter 1. The results of the review are discussed below.

### Addition of the Hanford 3013 Convenience Can Configuration

The Hanford 3013 Convenience Can configuration, per Figure 1.11(k) of the SARP, has been analyzed in a manner that was similar to that used for previously analyzed 3013 Can configurations. Due to the similarity with other previously authorized content configurations, no adverse effects on the nuclear criticality safety design of the packaging were expected or found.

### Alternate Thick Honeycomb Spacer Configuration

As mentioned previously, this configuration has been withdrawn from consideration and will not be authorized in the revised Certificate of Compliance.

### Elimination of Loading Configurations as Previously Allowed Contents

A variety of reviews and analyses had previously been conducted on the use of the following authorized content configurations:

- The Aries Convenience Can inside a 3013 can configuration, and
- The SRS Convenience Can inside the SRS Bagless Transfer Can inside a 3013 can configuration.

Since the elimination of previously authorized content configurations has no effect on the overall safety basis of the 9975 packaging, no adverse effects on the nuclear criticality safety design of the packaging were expected or found.

### Elimination of a Proposed Content Configuration from Further Consideration

The LLNL Hex Can configuration had been under consideration as a proposed content configuration under an earlier version of the SARP. Since this particular content configuration has now been removed from further consideration as an allowable content configuration, this request has no effect on the overall safety basis of the 9975 packaging.

### **Findings**

Based on the review of the statements and representations in the SARP and the application, the reviewers have concluded that the nuclear criticality safety design has been adequately described and evaluated and that the package meets the nuclear criticality safety requirements of 10 CFR Part 71.

### **Conditions of Approval**

Conditions of approval for this request are discussed in Chapter 7, below.

### **Chapter 7: Operating Procedures**

This SER covers the reviewers findings regarding the review of Revision 15 of the 9975 SARP (References 1 and 2). This section covers the review of the Operating Procedures information provided in Chapter 7 of the SARP.

Details of the items reviewed are listed above in the introduction to Chapter 1. The results of the review are discussed below.

#### Addition of the Hanford 3013 Convenience Can Configuration

Because the Hanford 3013 Convenience Can configuration, per Figure 1.11(k) of the SARP, is very similar to other 3013 can configurations that are already allowed, there are no Operating Procedures-related issues associated with the addition of the Hanford 3013 Convenience Can configuration.

#### Alternate Thick Honeycomb Spacer Configuration

As mentioned previously, this configuration has been withdrawn from consideration and will not be authorized in the revised Certificate of Compliance.

#### Elimination of Loading Configurations as Previously Authorized Contents

The staff finds no safety- or regulatory-related concerns with the request to eliminate the Aries Convenience Can inside a 3013 can configuration or the SRS Convenience Can inside the SRS Bagless Transfer Can inside a 3013 can configuration as authorized contents for the 9975 packaging.

#### Elimination of a Proposed Content Configuration from Further Consideration

As noted in the previous section, the reviewer finds no safety- or regulatory-related concerns with the applicant's request. However, in order to minimize any potential for future confusion, a change will be made to the current Certificate of Compliance (see below).

## **Findings**

Based on the review of the statements and representations in the SARP and the application, the reviewer has concluded that the package design has been adequately described to meet the requirements of 10 CFR Part 71.

## **Conditions of Approval**

The requirements specified in Chapter 7 of the SARP have already been incorporated into the existing Certificate of Compliance for the 9975 Package (Reference 3) in their entirety. However, the following conditions of approval will be added to the certificate:

1. In order to eliminate any potential confusion between the notation "... the LLNL convenience can..." and "... the LLNL HEX can..." the parenthetical statement "... (including the LLNL convenience can)..." will be deleted from condition 5(d)(1) of the certificate; and
2. Per the proposal from SR to EM-5 discussed in Chapter 1, condition 5(d)(4) of the certificate will be revised to prohibit the use of the newer (increased height) PCV spacer described above for all 3013 loading configurations. Additionally, per the SR proposal, condition 5(d)(4) will specify that the two-piece alternate spacer configuration [SARP Figure 1.11(i)] is approved only for 9975 packages with serial numbers 1301 through 2750, and the original spacer configuration is approved for all other 9975 packages.

## **Chapter 8: Acceptance Tests and Maintenance**

This SER covers the reviewers findings regarding the review of Revision 15 of the 9975 SARP (References 1 and 2). This section covers the review of the Acceptance Tests and Maintenance information provided in Chapter 8 of the SARP.

Details of the items reviewed are listed above in the introduction to Chapter 1. The results of the review are discussed below.

### Addition of the Hanford 3013 Convenience Can Configuration

Because this request is associated with a change of contents only, there are no acceptance test- or maintenance-related issues associated with the addition of the Hanford 3013 Convenience Can configuration.

### Alternate Thick Honeycomb Spacer Configuration

As mentioned previously, this configuration has been withdrawn from consideration and will not be authorized in the revised Certificate of Compliance.

### Elimination of Loading Configurations as Previously Authorized Contents

There are no acceptance test- or maintenance-related issues associated with the elimination of previously authorized contents.

Elimination of a Proposed Content Configuration from Further Consideration

There are no acceptance test- or maintenance-related issues associated with the elimination of a previously proposed content configuration.

**Findings**

Based on the review of the statements and representations in the SARP and the application, the reviewer has concluded that the package design has been adequately described to meet the requirements of 10 CFR Part 71.

**Conditions of Approval**

The requirements specified in Chapter 8 of the SARP have already been incorporated into the existing Certificate of Compliance for the 9975 Package (Reference 3) in their entirety. Conditions of approval for this request are discussed in Chapter 7, above.

**Chapter 9: Quality Assurance**

This SER covers the reviewers findings regarding the review of Revision 15 of the 9975 SARP (References 1 and 2). This section covers the review of the Quality Assurance information provided in Chapter 9 of the SARP.

Details of the items reviewed are listed above in the introduction to Chapter 1. The results of the review are discussed below.

Addition of the Hanford 3013 Convenience Can Configuration

Because this request is associated with a change of contents only, there are no quality assurance-related issues associated with the addition of the Hanford 3013 Convenience Can configuration.

Alternate Thick Honeycomb Spacer Configuration

As mentioned previously, this configuration has been withdrawn from consideration and will not be authorized in the revised Certificate of Compliance.

Elimination of Loading Configurations as Previously Allowed Contents

There are no quality assurance-related issues associated with the elimination of previously authorized contents.

Elimination of a Proposed Content Configuration from Further Consideration

There are no quality assurance-related issues associated with the elimination of a previously proposed content configuration.

**Findings**

Based on review of the statements and representations in the SARP and the application, the staff concludes the quality assurance plan has been adequately described and meets the quality assurance requirements of 10 CFR Part 71, Subpart H. Package-specific requirements are adequate to assure the package is designed, fabricated, assembled, tested, used, maintained, modified, and repaired in a manner consistent with its evaluation.

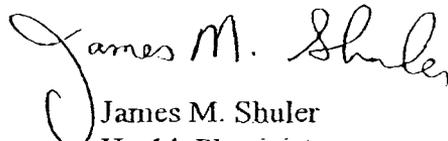
**Conditions of Approval**

The requirements specified in Chapter 9 of the SARP have already been incorporated into the existing Certificate of Compliance for the 9975 Package (Reference 3) in their entirety. Conditions of approval for this request are discussed in Chapter 7, above.

**References**

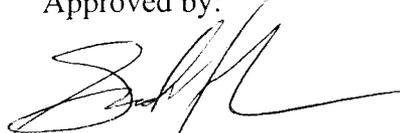
1. WSRC Letter, H. T. Conner Jr. to R. Kevin Hall, OBU-2003-00025, Subject: *Re-Transmittal of 9972 - 9975 Safety Analysis Report for Packaging (SARP)*, Revision 15, May 23, 2003 (w/attachments).
2. WSRC fax, Paul Blanton to Jim Shuler, EM-5, Ron Hafner, LLNL, and Steve Primeau, Eagle Research, Subject: *9975 Conference Call Held Tuesday August 5<sup>th</sup> - SR/DOE/EM-5/WSRC*, August 8, 2003.
3. U.S. Department of Energy Certificate of Compliance USA/9975/B(U)F-85 (DOE), Revision 9, March 13, 2003.

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