SAFETY EVALUATION REPORT

Docket No. 71-9282
Model No. SPEC-300 Package
Certificate of Compliance No. 9282
Revision No. 3

SUMMARY

By application dated February 9, 2015, Source Production & Equipment Company, Inc. (SPEC, or the applicant), requested renewal of Certificate of Compliance (CoC) No. 9282 for the Model No. SPEC-300 package.

The applicant did not request any modification to the package design, acceptance tests, and maintenance program of the package. However, staff did request one additional step in the operating procedures during the preparations for package loading. The consolidated application includes: (i) all changes that were previously approved in each of the supplements of the original application, (ii) clarifications and edits requested, and approved by staff, during the 2011 amendment request of the Model No. SPEC-150 package, as applicable to the Model No. SPEC-300, and (iii) responses to the March 3, 2010, request for additional information (RAI) letter necessary for staff to complete its review of the October 28, 2009, amendment request for the Model No. SPEC-300 package.

The staff reviewed the consolidated application dated February 9, 2015, in support of the renewal request and determined that the documentation was available and complete. Staff agrees that the changes do not affect the ability of the package to meet the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 71. Accordingly, the certificate has been renewed for an additional five year period.

EVALUATION

By application dated February 9, 2015, the applicant requested renewal of Certificate of Compliance (CoC) No. 9282 for the Model No. SPEC-300 package. The applicant submitted a consolidated application that supersedes all previous revisions and supplements of the application. The staff determined that the documentation was available and complete.

By letter dated March 29, 2011, staff had advised the applicant that responses to the staff's RAI letter, dated March 3, 2010, will have to be included in any renewal, or future amendment, request for the Model No. SPEC-300 package (see ADAMS Accession No. ML110890012). The consolidated application includes those RAI responses. The applicant had withdrawn some of its proposed request for modifications (RAI Nos. 4, 9, 10, and 16) while RAI Nos. 7 and 8 were withdrawn by staff since they referred to packages made of titanium (the Model No. SPEC-150 package) whereas the Model No. SPEC-300 package is made of stainless steel.

The licensing drawings, and drawing fabrication notes 17 and 18, were revised to specify the use of the AWS or ASME codes for all welding processes and inspection activities (as approved for the Model No. SPEC -150 package) to resolve RAI Nos. 1, 2, 3, and 6. Drawing B190701 was created to specify the standard industrial codes for all materials used to construct safety-

related components, in accordance with the documentation provided for the Model No. SPEC-150 package's "safety essential components," this in order to respond to RAI No. 5.

Drawing B190700 was revised to document the minimum weight for the depleted uranium (DU) shield to respond to RAI No. 14. The revised drawing also specifies the maximum mass and thickness for the supplemental shielding pads, a minimum density of 18.3 g/cm^3, and includes changes, already approved by staff on the Model No. SPEC-150 package, such as the quality classification of the DU shields to category B, in accordance with NUREG/CR-6407 and NUREG/CR-5502, in order to respond to RAI Nos. 11 and 12. An inspection step was added to the operating procedures to respond to a staff's concern. Other typos, corrections, and editorial changes were made as needed, e.g., tBq was changed to TBq, etc.

Based on the statements and representations in the application, and the conditions listed in the CoC, the staff has reasonable assurance that the design has been adequately described and evaluated and meets the requirements of 10 CFR Part 71.

1.0 GENERAL INFORMATION

1.1 Package Description

The description of the Model No. SPEC-300 package, a ^{60}Co industrial radiography device, is unchanged from previous revisions of the certificate.

This Type B package has a maximum gross weight of 780 lb. The enclosure and lock box are made of 316/316L stainless steel. The cavity, with a 0.5 inch internal diameter, is an S-shaped tube going through the DU shield between the lock end and outlet end bulkheads. A polyurethane foam fills the void between the DU shield and the device enclosure.

1.2 Package drawings

The applicant removed a duplicate reference of the shield drawing in Appendix 5.7 of the application, and corrected the reference in Appendix 5.5 of Section 5.1 of the application. A summary of the changes made to the licensing drawings is presented below:

Drawing	Rev.	Summary of Changes
B190701	1	Specification of standard industrial codes for all safety-related components.
B190700	5	Documentation of minimum weight for the depleted uranium shield. Specification of the maximum mass and thickness of the supplemental shielding pads.
19B000	5	Addition of minimum foam density. Indication that the weld between the enclosure cover and the base is a full penetration weld. Correction of the height of the package. Removal of parts numbers from parts list. Clarification that ITS welds and fabricated and liquid penetrant inspected in accordance with the 2007 edition of ASME Section VIII, Division 1/ASME Section V, Article 9, or fabricated and inspected in accordance with AWS D1.9 2007 edition. There is no mixing of welding codes.

1.3 Contents

The contents have not changed: the special form capsule contains a maximum output activity of 11.1 TBq of ^{60}Co.

1.4 Evaluation Findings

Based on the statements and representations in the application, the staff finds that the proposed changes are acceptable. The proposed changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

2.0 STRUCTURAL AND MATERIALS REVIEW

2.1 Structural Evaluation

The structural design of the package has not been modified.

The applicant eliminated duplicate justifications for the orientation of the testing of the Model No. SPEC-300 package in Appendices 2.10 and 5.7 of the application (referred to as Appendix 5.5 in Section 5.2 of the application). The duplicate justification from Appendix 5.7 was deleted to point only to Appendix 2.10 in the references to Section 5.2 of the application.

2.2 Materials Evaluation

The application and the licensing drawings were updated to provide more specific information about the welds and the materials used to fabricate the package. The materials of fabrication of the enclosure, lock box, module, and cap, safety plug, shield supports and bulkheads, etc., are now better identified and their mechanical properties specified.

Welds that are important to safety (ITS) are now identified as such to eliminate any confusion about which welds are structural in nature (thereby being ITS) and those welds which are merely fabrication aids and thus not ITS. The applicant has “classified” the welds in four categories, A, B, C, and D, i.e., welds with a governing construction code for welding along with the associated code inspection requirements, welds with calculations to demonstrate that the SPEC-300 package meets the criteria set forth in 10 CFR 71.45(a) and (b), and welds that have sizes larger than required by Category A.

Regardless of which construction code is employed, any one package would be entirely fabricated under a single Code, either ASME or AWS. In accordance with a long-standing staff position, no mixing of construction codes would occur during the fabrication of any package.

The staff finds that the identification of ITS welds on the licensing drawings, along with more specific information regarding the code of construction, the provision for a future alternative construction code, and the identification of more specific inspection requirements are appropriate and acceptable.

2.3 Conclusion

Based on the statements and representations in the application, staff agrees that the applicant has shown that the Model No. SPEC-300 package meets the structural and material requirements of 10 CFR Part 71.

3.0 THERMAL REVIEW

The renewal request does not affect the thermal performance of the Model No. SPEC-300 package. Staff had previously assessed whether the package temperatures remain within their allowable values or criteria for normal and accidental conditions of transport, as required in 10 CFR Part 71.

The Model No. SPEC-300 package design has been adequately evaluated and meets the thermal requirements set forth in 10 CFR Part 71.

4.0 CONTAINMENT REVIEW

The primary containment is the sealed source capsule meeting the requirements of 10 CFR 71.75 and 49 CFR 173.469 for special form radioactive material.

The Model No. SPEC-300 package meets the containment requirements set forth in 10 CFR Part 71.

5.0 SHIELDING REVIEW

The shielding evaluation was not modified by this renewal request. Adequate shielding of the package is confirmed by actual measurements of radiation profiles from the prototype shield and by actual measurements of resulting radiation levels under after the tests for normal conditions of transport and hypothetical accident conditions , as required in 10 CFR Part 71.

Based on its review, staff concludes that the Model No. SPEC-300 package design has been adequately evaluated for radiation shielding for the sources to be loaded and meets the requirements set forth in 10 CFR Part 71.

6.0 CRITICALITY REVIEW

This section is not applicable. The package does not contain and is not designed for transport of fissile material.

7.0 PACKAGE OPERATIONS

The staff reviewed Chapter 7 of the application to verify that the operating procedures meet the requirements of 10 CFR Part 71. At staff's request, Section 7.1.1 was revised to require a visual inspection of exposed fasteners and welds during preparations for loading in order to respond to RAI No. 13, dated March 3, 2010. The section now reads as follows: "Visually inspect the SPEC-300 to determine if it is in

unimpaired condition for shipment. The SPEC-300 should be inspected to determine that it is not damaged, that the locks operate properly, that the source assembly is securely locked in the package, and that the safety plug and lock cap are securely positioned. Visually inspect the exposed fasteners and welds during preparations for loading. Verify that the package identification plate is present and legible, which identifies the package as a SPEC-300 and displays the Certificate of Compliance identification number."

The package is thus now visually inspected to determine that it is not damaged, that the locks operate properly, that the source assembly is securely locked in the package and that the safety plug and lock cap are securely positioned. There were no design changes made to the package, and all manufactured SPEC-300 packages comply with the above requirements. Staff noted that the supplemental shielding pads, made from DU or tungsten as specified in Drawing B190700, are not used for compliance with 10 CFR Part 71 requirements. These pads may be added only to lower radiation levels to 50 mR/hr on the surface, and 1 mR/hr at 1 meter, to allow the Model No. SPEC-300 package to be transported as a Yellow II shipment without using an overpack.

Based on the statements and representations in the application, the staff concludes that the package meets the requirements of 10 CFR Part 71.

8.0 ACCEPTANCE TESTS AND MAINTENANCE PROGRAM

The staff reviewed Chapter 8 of the application, including the description of the weld joints that are visually inspected, the survey of every shield prior to first use, and the visual check of the fasteners to verify that the acceptance tests for the packaging meet the requirements of 10 CFR Part 71.

The Model No. SPEC 300 package will be fabricated and inspected in accordance with the 2007 or later edition of the ASME Code, Section VIII, Division 1. Alternatively, the 2007 or later edition of the AWS D1.9 Welding Code may be used for fabrication and inspection. Regardless of which construction code is used, any single package must be entirely fabricated and inspected in accordance with only a single edition of the referenced construction code. No mixing of codes or editions is permitted for a single package.

Based on the statements and representations in the application, the staff concludes that the revised acceptance tests for the packaging meet the requirements of 10 CFR Part 71.

CONDITIONS

The following changes have been made to the Certificate:

Item No. 3(b) was amended to include the consolidated application dated February 9, 2015.

Condition No. 5(a)(2) was amended to include the total height of the package with the lifting eye blocks.

Condition No. 5(a)(3) was amended to include the latest revisions of the licensing drawings, i.e., Drawing Nos. 19B000 sheets 1-8, Rev. 5, B190700, sheet 1, Rev. 5, and B190701, sheet 1, Rev. 1.

Previous Condition No. 10 of the certificate, which had the certificate expiration date of April 30, 2015, was modified to allow the use of Revision No. 2 of the certificate for approximately one year.

Condition No. 11 was added to reflect the new expiration date of the certificate.

The consolidated application, dated February 9, 2015, was included in the References Section.

CONCLUSION

Based on the statements and representations in the application, and the conditions listed above, the staff concludes that the Model No. SPEC-300 package design has been adequately described and evaluated. The certificate has been renewed for a five year term that expires on April 30, 2020. This change does not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9282, Revision No. 3,
on April 7, 2015.