



EM Environmental Management

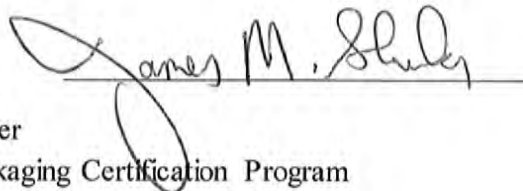
safety ❖ performance ❖ cleanup ❖ closure

DOE Packaging Certification Program

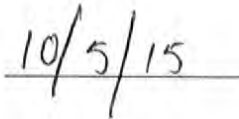
**Safety Evaluation Report for
Request to Renew ES-3100 Certificate**

Docket No. 14-18-9315

Prepared by:



Date:

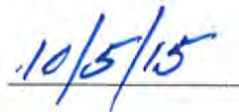


James M. Shuler
Manager, Packaging Certification Program
Office of Packaging and Transportation

Approved by:



Date:



Frank Marcinowski
Headquarters Certifying Official
Deputy Assistant Secretary for Waste Management

This Safety Evaluation Report (SER) documents the U.S. Department of Energy (DOE) Packaging Certification Program (PCP) technical review of the application submitted by the National Nuclear Security Administration (NNSA) Office of Material Management and Minimization (NA-23) requesting renewal of DOE Certificate of Compliance (CoC) Number 9315.

Summary

By a letter ^[1] dated June 25, application ^[2] dated June 30, as supplemented ^[3] August 12, NA-23 requested DOE to renew CoC Number 9315. The current CoC, 9315, Revision 9, expires September 30. In applying for renewal the applicant subsequently submitted a consolidated application ^[4] on September 3 with all page changes that are incorporated by reference in the existing certificate. The consolidated application also included minor administrative changes due to a change of the Management & Operating (M&O) Contractors at the Y-12 Plant, regulatory updates, removal of text regarding extended maintenance of the packaging, and additional content Table notes for clarification and consistency with the CoC.

PCP staff confirmed by document review that the applicant incorporated all the previously approved changes in the consolidated application, including the aforementioned changes subsequent to those approved in CoC Revision 9. Therefore, based on the statements and representation in the consolidated application and the conditions listed below, staff concludes that the package continues to meet the requirements of 10 CFR Part 71.

Evaluation

DOE CoC Revision history:

- Revision 0, issued 10/5/2009 – based on endorsement of NRC CoC 9315, Revision 9 and *Safety Analysis Report, Y-12 National Security Complex, Model ES-3100 Package with Bulk HEU Contents*, Y/LF-717, Revision 3, May 2009
- Revision 1, issued 9/17/2010 – added new bulk highly enriched uranium (HEU) contents, neutron absorber can material change, allowed flow-forming fabrication of the containment vessel, clarification of the role of efflorescence on uranyl nitrate crystals with respect to the maximum normal operating pressure and internal pressure. Rev. 1 is based on new *Safety Analysis Report for Packaging, Y-12 National Security Complex, Model ES-3100 Package with Bulk HEU Contents*, SP-PKG-801940-A001, Revision 0, September 2010
- Revision 2, issued 11/23/2010 – adds additional information to support operations and to re-confirm and explicitly state that the shipment of fissile material by air approved under Revision 1 of the CoC met the requirements of 10 CFR 71.55(f). Rev. 2 is based on SP-PKG-801940-A001, Revision 0, with Page Change 1, November 2010
- Revision 3, issued 6/7/2011 – incorporates administrative and editorial changes and a sunset condition on previously approved CoCs. Rev. 3 is based on SP-PKG-801940-A001, Revision 0, with Page Change 2, February 2011
- Revision 4, issued 8/2/2012 – changes the U-233 concentration limit. Rev. 4 is based on SP-PKG-801940-A001, Revision 0, with Page Change 3, June 21, 2012
- Revision 5, issued 1/24/2013 – adds bulk HEU oxide as contents for air transport and uranium silicide as contents for ground transport, and the option to use the ARG-US Radiofrequency Identification System (RFID). Rev. 5 is based on SP-PKG-801940-A001, Revision 0, with Page Change 4, January 10, 2013 and RFID supplements (CoC Refs. 6 and 7).
- Revision 6, issued 11/19/2013 – one-time international shipment of enriched uranium powder. Rev. 6 is based on *Authorization of Air Transport of EU Powdered Metal Form in the ES-3100 Packaging*, Docket 13-37-9315, Memorandum, O'Connor to Kilmartin, dated September 26, 2013
- Revision 7, issued 2/7/2014 – adds HEU metal or alloy turnings, fines, or powders as contents for ground and air transport, and to extend CoC expiration for 1-year. Rev. 7 is based on SP-PKG-801940-A001, Revision 0, with Page Change 5, September 30, 2013.
- Revision 8, issued 5/9/2014 – allows use of Viton GLT-S as optional o-ring material in the containment vessel and changes to convenience can size and configuration (and associated drawing changes). Rev. 8 is based on SP-PKG-801940-A001, Revision 0, with Page Change 6, February 27, 2014
- Revision 9, issued 3/4/2015 – removes the carbon restriction for HEU oxide (U_3O_8) for ground transport. Rev. 9 is based on *Analysis of HEU oxide (U_3O_8) with carbon concentrations, for shipment in the ES-3100*, September 15, 2014

PCP staff verified these previously approved changes were implemented in the consolidated application.

The applicant submitted SP-PKG-801940-A001, Revision 0, with Page Change 7, dated June 25, 2015 with the following administrative changes and clarifications:

- References to the Y-12 M&O Contractor were changed from B&W Y-12 to Consolidated Nuclear Security, LLC (CNS)
- Reference to the Quality Assurance Program Plan document was updated to the latest revision (QAP-Y-91-273860-1, Rev. 14) and changes for the CNS organization/position titles and procedural requirements
- Regulatory references updated to the latest editions
- References and discussion of extended maintenance of the packaging were removed, since DOE did not approve extended maintenance

PCP staff verified Page Change 7 was implemented in the consolidated application and does not effect the ability of the package to meet the requirements of 10 CFR Part 71.

The applicant submitted subsequent page changes on August 12, 2015, during the PCP staff review, to clarify content information in Tables 1.3, 1.3b, and 6.2a, of the application for small samples. The statement "If the mass of the metal or alloy turnings, fines, or powders is less than or equal to 50 g, then it may be shipped as the parent form (e.g., broken metal, reactor fuel, etc.)" was added to these Table. When shipping small samples of metal fines along with broken metal with enrichment greater than 80%, those samples were always considered to be broken metal. The category of "HEU metal or alloy turnings, fines or powders" is for the situation where the entire ES-3100 package is carrying only cans full of turnings, fines, and powders of up to 19.284 kg with an enrichment of less than or equal 80%.

PCP staff verified that these final page changes were implemented in the consolidated application and do not effect the ability of the package to meet the requirements of 10 CFR Part 71.

Conditions

Revisions to CoC 9315, Revision 9 for renewal of the CoC (Revision 10)

1. Drawings (updated for removal of extended maintenance and new M&O contractor):
 - M2E801580A011, Revision F, Containment Vessel Assembly
 - M2E801580A031, Revision G, Main Assembly
 - M2E801580A037, Revision F, Consolidated Assembly Drawing (3 sheets)
2. Add Table Note "p" to Table 1.3 and Table Note "k" to Table 1.3a as follows, "If the mass of metal or alloy turning, fines, or powders is less than or equal to 50 grams, then it may be shipped as the parent form (e.g., broken metal, reactor fuel, etc.)."

3. Revise Condition 5 to “Intact TRIGA fuel elements and fuel section elements (pellets) are allowed. Fuel from ...”
4. Revise Condition 7 to “... to allow for gas expansion and offgassing of packaging materials...”
5. Revise Condition 13 to allow the use of Revision 8 and 9 of the DOE Certificate of Compliance until September 30, 2016.

Conclusion

Based on the statements and representations in the consolidated application, as supplemented, and the conditions listed above, PCP staff concludes that the changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

References

- [1] *Request for Renewal of ES-3100 Package with HEU Contents, Docket 14-18-9315, Certification of Compliance (CoC) USA/9315/B(U)F-96 (DOE)*, submitted to US Department of Energy Packaging Certification Program, by the National Nuclear Security Administration (NNSA), Office of Materials Management and Minimization (NA-23), June 25, 2015.
- [2] *Safety Analysis Report for Packaging, Y-12 National Security Complex, Model ES-3100 Package with Bulk HEU Contents, SP-PKG-801940-A001, Rev. 0, Page Change 7*, Consolidated Nuclear Security, LLC, June 30, 2015.
- [3] *Y-12 Draft of ES-3100 CoC Revision 10*. Email, Jeffrey Arbital to Larry Gelder, August 12, 2015.
- [4] *Safety Analysis Report for Packaging for Model ES-3100 Package with Bulk HEU Contents, SP-PKG-801940-A001, Rev. 1*, Consolidated Nuclear Security, LLC, September 3, 2015.