

**Safety Evaluation Report for
Shipping an Alternate Radioisotopic Thermoelectric
Generator (RTG) Assembly Configuration in the 9977
Packaging**

**Paul Mann (NNSA) Memorandum to James Shuler DOE PCP
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Background

The Department of Energy (DOE) Packaging Certification Program (PCP) received a amendment request (Ref. 1) and supporting information describing a proposed modification to the Radioisotope Thermoelectric Generator (RTG) Assembly Contents for the Model 9977-96 Radioactive Material Transportation Package. The DOE PCP staff performed a technical review of the proposed changes to the RTG Assembly Contents, as described in *Safety Analysis Report for Packaging Model 9977*, S-SARP-G-00001, (Ref. 2) to determine if the proposed changes are within the established safety basis for the packaging.

The current authorized RTGs Content in the Model 9977-96 is defined as “C.1 Heat Sources” in the Safety Analysis Report for Packaging (SARP) Table 1.2, *Contents*, (Ref. 2) and remains unchanged in this request. The Sandia National Laboratories RTG Assembly packing configuration currently authorized within the 6CV is shown in Figure 1.5 of the SARP. The baseline RTG Assembly components are defined in the drawings listed in SARP Section 1.2.2.1.1. As stated in SARP Section 1.2.2.2.1: “The configuration is required only for protection of the RTGs and has no influence on the package safety evaluation.”

The proposed changes to the currently approved RTG Assembly contents essentially involve making the RTG Assembly more robust by adding bosses to the fin cups and flanges to the ends of the union that provide a larger diameter for the assembly bolt circle.

Review Results

Even through the proposed changes to the RTG Assembly Contents increase the content mass slightly, the resulting total content mass is still well below the maximum authorized content mass of 100 pounds. Therefore, there are no structural concerns associated with the changes.

Since the isotopic content is not changed, the existing safety basis for heat transfer, shielding, and criticality remain valid.

Since there are no changes to the operating procedures or acceptance tests and maintenance associated with the modified contents, these elements are also with the existing safety basis.

The drawings submitted that depict the proposed changes were reviewed and no quality assurance concerns were identified.

References

1. Memorandum from P. Mann to J. Shuler, *ACTION: Application for Contents Amendment for Shipping Alternate Radioisotopic Thermoelectric Generator (RTG) Assembly Configurations in 9977 Packaging*, November 22, 2010.
2. Abramczyk, G. and Blanton, P. S., *Safety Analysis Report for Packaging Model 9977*, S-SARP-G-00001, Revision 2, (August 2007).