ENCLOSURE 1

M190005

Corrected Pages for NEDE-33869P Revision 10

~~GNF-A Proprietary Information – Class II (Internal)~~

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Revision Summary

Revision	Description
0	Initial Issue
7.1	Revised to incorporate administrative updates to align the SAR to the current Certificate of Compliance, provide clarifications, and correct minor errors.
8	Withdrawn
9	Modified to reflect changes to the GNF 10x10 fuel.
10	Revised to incorporate changes in response to Revision 9 requests for additional information 1.0 and 7.0. Revised to update the revision of the NRC-approved quality assurance program (Reference 1-1) from Revision 13 to Revision 14.

Revision 10 Detailed Revision Summary

Location	Description of Change
Chapter 1	
Section 1.1	Revised the first paragraph to update the revision of the quality assurance program.
Section 1.3.1.1	Revised Outer Container Drawing 105E3738 Revision # to reflect that Sheet 1 is now Revision 11 while Sheets 2 and 3 remain at Revision 10.
Section 1.3.2	Revised Reference 1-1 to update the revision and date of the quality assurance program.
Drawing 105E3738	Revised Sheet 1 to Revision 11 to include an optional Item 47 on the parts list. This item is the container guide and provides operational convenience when loading the inner packaging into the outer packaging.
Chapter 7	
Section 7.1.1	To provide consistency with the retitled Table 7-1, deleted the word "recommended" in front of "torques provided in Table 7-1."
Table 7-1	Retitled the table, redefined the torque for all table components to be "wrench tight or as defined in user procedures," and deleted the note below the table.
Section 7.1.2.1	To provide consistency with the retitled Table 7-1, rephrased "per the torque recommendations in" to "per the torque in."

1.0 GENERAL INFORMATION

This chapter of the Safety Analysis Report (SAR) presents an introduction and general description of the RAJ-II package. The major components comprising the RAJ-II package are presented in Figure 1-1 through Figure 1-4. Terminology and acronyms used throughout this document are presented in the Acronyms table. This package is intended to be used to transport unirradiated Boiling Water Reactor (BWR) fuel assemblies, BWR fuel rods, CANDU fuel rods, and Pressurized Water Reactor (PWR) fuel rods, containing Type B fissile material. The fissile material can be in the form of uranium dioxide or uranium carbide enriched up to 5.0 weight percent (wt%) U-235.

1.1 INTRODUCTION

The model RAJ-II package number USA/9309/B(U)F-96, under docket 71-9309, has been developed to transport Type B fissile material. The analyses are performed under an NRC-approved quality assurance program documented in NEDO-11209-A, Revision 14 (Reference 1-1), which specifically complies with Title 10 of the Code of Federal Regulations, Part 50 (10 CFR 50) Appendix B requirements and is adopted to meet the requirements of 10 CFR 71, Subpart H for transportation of radioactive material.

The integrity of the fuel is maintained by the protective outer package, the insulated inner package and the fuel rod cladding through both Normal Conditions of Transport (NCT) and Hypothetical Accident Condition (HAC) deformations. A variety of full-scale engineering development tests were included as part of the certification process. Ultimately, two full-scale Certification Test Units (CTUs) were subjected to a series of free drops and puncture drops. The inner and outer containers provide both thermal protection as well as mechanical protection from drops or accident conditions.

Fuel rod cladding and welded end plugs form the containment vessel of the radioactive material contents transported in the RAJ-II package. The RAJ-II package is designed for shipment by truck, ship, or rail as a Type B fissile material package per the definition in 10 CFR 71.4 and 49 CFR 173.403. The requirements of Type B packages are demonstrated in Chapter 4 where the effective A_2 and allowable leakage rates are provided in Section 4.5.

The payload within each RAJ-II package consists of a maximum of two unirradiated BWR fuel assemblies or individual rods (BWR, uranium carbide, or generic PWR) contained in a 5-inch stainless steel pipe, protective case or strapped together and positioned in one or both sides of the inner container. See Table 6-1 and Table 6-2 for the fuel loading criteria. The shielding and criticality assessments are provided in Chapter 5.0 and Chapter 6.0. The Transport Index (TI) for this package is based on the shielding assessments described in Chapter 5.0. The Criticality Safety Index (CSI) for the RAJ-II package is defined in Chapter 6.0. Section 6.1.3 provides the calculation of the CSI, where the CSI for fuel assemblies is 1.0 and the CSI for fuel rods is 1.6.

RAJ-II package dimensions identified in the text, tables, and figures of this SAR are intended to be nominal. The drawings provided in Section 1.3.1 contain the dimensions and the tolerances.

1.3 APPENDIX

1.3.1 RAJ-II General Arrangement Drawings

This section presents the RAJ-II package general arrangement drawing consisting of 15 drawings entitled *RAJ-II SAR Drawing* listed in Section 1.3.1.1. Within the packaging general arrangement drawing, dimensions important to the packaging safety are dimensioned and toleranced. Other dimensions are provided as reference dimensions and are toleranced in accordance with the Japan Industrial Standard (JIS) B 0405. See Sections 2.1.4.1 and 2.1.4.2.

1.3.1.1 Drawing List

Outer Container Drawings

Drawing Number	Sheet Number	Revision #	Name
105E3737	1	8	Outer/Inner Container Assembly Licensing Drawing
105E3738	1, 2, 3	11, 10, 10	Outer Container Main Body Assembly Licensing Drawing
105E3739	1	6	Outer Container Fixture Assembly Licensing Drawing
105E3740	1	6	Outer Container Fixture Assy Installation Licensing Drawing
105E3741	1	3	Outer Container Shock Absorber Assy Licensing Drawing
105E3742	1	5	Outer Container Bolster Assembly Licensing Drawing
105E3743	1	7	Outer Container Lid Assembly Licensing Drawing
105E3744	1	8	Outer Container Marking Licensing Drawing

Inner Container Drawings

Drawing Number	Sheet Number	Revision #	Name
105E3745	1, 2, 3, 4	10	Inner Container Main Body Assembly Licensing Drawing
105E3746	1	3	Inner Container Parts Assembly Licensing Drawing
105E3747	1	6	Inner Container Lid Assembly Licensing Drawing
105E3748	1	4	Inner Container End Lid Assembly Licensing Drawing
105E3749	1	8	Inner Container Marking Licensing Drawing

Contents Drawings

Drawing Number	Sheet Number	Revision #	Name
105E3773	1	2	RAJ-II Protective Case Licensing Drawing
0028B98	1	2	Shipping Container Loose Fuel Rods

1.3.2 References

1-1 GE Hitachi Nuclear Energy, “Quality Assurance Program Description,” NEDO-11209-A, Revision 14, January 19, 2018.