Crosswalk: 10CFR71 Requirements to Applicable Section of Topical Report

Topical Report: The Role of the DOE Standardized SNF Canister in Transportation Safety

The USDOE is not seeking a license for a transportation package. Rather, DOE will submit a topical report seeking NRC concurrence that the standardized DOE SNF canister may be credited for remaining leaktight and thus precluding moderator intrusion under conditions that may result in reconfiguration of the canister contents (e.g. hypothetical accident conditions). The topical report has two key objectives:

1) To confirm that DOE SNFs to be repackaged into DOE standardized SNF canisters will be acceptable for transportation.

2) To provide a starting point for an applicant to prepare an application for (or an amendment to) a certificate of compliance for a package to transport DOE SNFs.

Hence, the table below shows, for each of the requirements from 10CFR71, the portions of the topical report containing information that a future applicant may consider if crediting canister performance as part of the basis for compliance.

10 CFR71	Summary of the Requirement(s)	Addressed in Topical Report Section #	Explanation
	Subpart A: General Provisions		
71.0	**Purpose and Scope**: Establishes applicability of the regulation	---	---
71.1	**Communications & Records:** Identifies means for communications via hard copy and electronic submission and establishes record-keeping requirements (e.g. legibility, safeguards, retention, etc.).	1.1.2, 2.3, 7.1	Although this requirement applies to the application for a C of C, it will be applied to the communications and technical documentation supporting submittal of the topical report. See entry for 71.91 for a discussion of QA records
71.2	**Interpretations**: Specifies that unless issued by the NRC in writing, no specific interpretation of this regulation shall be binding on the NRC.	---	---
71.3	**Requirements for License**: A licensee shall not transport (or deliver to a carrier) radioactive material except as authorized or exempted	---	---
71.4	**Definitions:**	---	---
71.5	**Transportation of Licensed Material**: Specifies applicability of DOT and other regulations to transportation of radioactive material in the public domain.	---	---
71.6	**Information Collection Requirements**: Invokes paperwork reduction act and notes that info requests must be supported by a valid OMB control #.	---	---
71.7	**Completeness and Accuracy of Information:** Requires that complete and accurate information be maintained.	---	Although not specifically addressed in the topical report, It is expected that these provisions will apply to the preparation and submittal of the topical report because it is intended that future applicants will rely on the information provided in the topical report.
71.8	**Deliberate Misconduct:** Declares policy and enforcement actions with respect to deliberate misconduct.	---	
71.9	**Employee Protection:** Declares policy with respect to employee rights and protections.	---	
71.10	**Public Inspection of Application:** Declares that all applications	---	

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	submitted to the NRC under 10CFR71 may be made available for public inspection.		
71.11	----Reserved-----	---	---
	Subpart B: Exemptions		
71.12	**Specific Exemptions:** NRC may grant exemptions to anyone if law allows and public health and safety or defense and security not compromised.	---	---
71.13	**Exemption of Physicians**	---	---
71.14	**Exemption for Low-Level Materials**	---	---
71.15	**Exemption from Classification of Fissile Material**	---	---
71.16	-----Reserved-----	---	---
	Subpart C: General Licenses		
71.17	**General License**: NRC-Approved Package:	---	---
71.18	-----Reserved-----	---	---
71.19	**Previously Approved Package**	---	---
71.20	**General License**: DOT-Specification Container	---	---
71.21	**General License**: Use of Foreign Approved Package	---	---
71.22	**General License:** Fissile Material	---	---
71.23	**General License**: Pu/Be Special Form Material	---	---
71.24	-----Reserved-----	---	---
71.25	-----Reserved-----	---	---
	Subpart D: Application for Approval		
71.31	**Contents of Application**	---	Section header
71.31(a)	This section simply invokes 71.33, 71.35, and 71.37.	---	See table entries corresponding to 10CFR71.33, 71.35, and 71.37
71.31(b)	Except as provided in §71.13, an application for modification of a package design, whether for modification of the packaging or authorized contents, must include sufficient information to demonstrate that the proposed design satisfies the package standards in effect at the time the application is filed.	---	The topical report is not an application for modification of a package design.
71.31(c)	The applicant shall identify any established codes and standards proposed for use in package design, fabrication, assembly, testing, maintenance, and use. In the absence of any codes and standards, the applicant shall describe and justify the basis and rationale used to formulate the package quality assurance program.	2.1.4, 6.1.1	Applicable codes and standards are identified with respect to canister structural integrity and criticality considerations. Codes and standards relevant to containment and shielding functions of the canister are not applicable as credit for canister performance is not sought in these areas. No codes or standards with respect to maintenance and use of the canister have been identified.
71.33	**Package Description:** This section itemizes the information that must be included with respect to the package and the contents of the package. The description of the package must include sufficient detail identify the package accurately and provide sufficient basis for evaluation of the package. The description must include…	See entries for 71.33(a) and (b) below	---
71.33(a)	Requirements related to packaging	---	Section header
	(1) classification of package type	1.1.2	---

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	(2) gross weight	2.1.3 1.3.2	--- ---
	(3) model number	2.1.2	Applies to the transportation cask. Canister design criteria require that each canisters be labeled to ensure each is uniquely identifiable.
	(4) identification of containment system	1.1.2	The transportation cask will provide all required containment functions.
	(5) specific materials of construction, weights, dimensions, and fabrication methods	2.2.1, 2.1.3, 1.2.1, 2.3, 3, 6.3.2	---
	(6) identification of any receptacles containing coolant	---	Canisters will be dried and sealed prior to shipment
71.33(b)	Requirements related to the contents of the package	---	Section header
	(1) identification and maximum radioactivity of radioactive constituents	5.2.1 (gamma) 5.2.2 (neutron)	Dose and shielding calculations are not included in the topical report as they must be calculated in the context of the complete transportation package. An average canister source term is provided for illustrative purposes and a reference to the document containing fuel-specific source term estimates is provided.
	(2) identification and maximum quantities of fissile constituents	6.2, 6.3.4	---
	(3) chemical and physical form	1.2.2	---
	(4) extent of reflection, the amount and identity of nonfissile materials used as neutron absorbers or moderators, and the atomic ratio of moderator to fissile constituents	6.3.1, 6.3.2	---
	(5) maximum normal operating pressure	3	---
	(6) maximum weight	2.1.3	---
	(7) maximum decay heat	3	---
	(8) identification and volumes of any coolants	---	Canister will be dried and sealed prior to shipment.
71.35	**Package Evaluation**	---	Section header
71.35(a)	Application must include a demonstration that the package satisfies the standards specified in subparts E and F of this part;	---	See table entries associated with 10CFR71.41 thru 71.65 (Subpart E) and 10CFR71.71 thru 71.77 (Subpart F)
71.35(b)	Application must include, for a fissile material package, the allowable number of packages that may be transported in the same vehicle in accordance with §71.59;	---	Because the final transport configuration will not be available until one or more casks are selected and a loading configuration is identified, the topical report will provide the basis for criticality safety for a single canister. To illustrate that criticality safety for an array of these canisters in a cask is achievable, the topical report will also include criticality analyses for an array of up to nine canisters in a typical transportation cask. Criticality analyses associated with the complete transportation package will be submitted by the applicant for a Certificate of Compliance for the future transportation package.

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10 CFR71	Summary of the Requirement(s)	Addressed in Topical Report Section #	Explanation
71.35(c)	Application must include, for a fissile material shipment, any proposed special controls and precautions for transport, loading, unloading, and handling and any proposed special controls in case of an accident or delay.	7.1 8.2	Discusses controls associated with the canister drying and sealing process to establish leaktight conditions to ensure that canister integrity will not be jeopardized by materials interactions during the interim storage period. Discusses a sampling and inspection program to confirm that the canister internal environment remains consistent with expectations and thus ensures the canister is not compromised during the interim storage period. The topical report addresses controls and precautions implemented to assure the canister is not compromised prior to placement into the transport cask. The topical report will demonstrate that sealed DOE standardized SNF canisters can be safely transported using traditional techniques. Hence, no "special" controls are anticipated during transportation.
71.37	**Quality Assurance**	---	Section header
71.37(a)	The applicant shall describe the quality assurance program (see Subpart H of this part) for the design, fabrication, assembly, testing, maintenance, repair, modification, and use of the proposed package.	1.1.2	The DOE standardized SNF canister design will be made available to DOE SNF sites for their use when repackaging SNFs for interim storage and/or preparing them for repository disposition. The topical report specifies conditions that must be met during procurement and/or fabrication of canisters, canister loading, storage, handling, and preparation for shipping in order for the canisters to be within the scope of the topical report.
71.37(b)	The applicant shall identify any specific provisions of the quality assurance program that are applicable to the particular package design under consideration, including a description of the leak testing procedures.	2.3	---
71.38	**Renewal of C of C and QA Program Approval**	---	---
71.39	**Requests for Additional Information**	---	---
	Subpart E: Package Approval Standards		
71.41	**Demonstration of Compliance:**	---	Section header
71.41(a)	The effects on a package of the tests specified in §71.71 ("Normal conditions of transport"), and the tests specified in §71.73 ("Hypothetical accident conditions"), and §71.61 ("Special requirements for Type B packages containing more than 10^5 A_2"), must be evaluated by subjecting a specimen or scale model to a specific test, or by another method of demonstration acceptable to the Commission, as appropriate for the particular feature being considered.	---	Although this requirement applies to the transportation cask (i.e. not necessarily to the canisters within the cask), the topical report will demonstrate that the DOE Standardized SNF Canister boundary remains leaktight during the specified normal and hypothetical accident conditions (see table entries associated with 10CFR71.71, 71.73, and 71.61). Section 1.1.2 specifies the performance requirements for the cask that will ensure that allowable canister loads are not exceeded.
71.41(b)	Taking into account the type of vehicle, the method of securing or	----	---

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10 CFR71	Summary of the Requirement(s)	Addressed in Topical Report Section #	Explanation
	attaching the package, and the controls to be exercised by the shipper, the Commission may permit the shipment to be evaluated together with the transporting vehicle.		
71.41(c)	Environmental and test conditions different from those specified in 71.71 and 71.73 may be approved by the Commission if the controls proposed to be exercised by the shipper are demonstrated to be adequate to provide equivalent safety of the shipment.	---	---
71.41(d)	Allows exceptions for one-time shipments of packages for which compliance with the other provisions of these regulations is impracticable provided the applicant demonstrates that compliance with the other provisions of the regulations is impracticable and that the requisite standards of safety are met.	----	---
71.43	**General Standards for All Packages:**	---	Section header
71.43(a)	The smallest overall dimension of a package may not be less than 10 cm (4 in).	1.2.1	---
71.43(b)	The outside of a package must incorporate a feature, such as a seal, that is not readily breakable and that, while intact, would be evidence that the package has not been opened by unauthorized persons.	---	Applies to transportation cask. Note: DOE standardized SNF canisters are permanently sealed (i.e. full-penetration structural welds)
71.43(c)	Each package must include a containment system securely closed by a positive fastening device that cannot be opened unintentionally or by a pressure that may arise within the package.	3	Although this requirement applies to the containment system (i.e. the transportation cask), the topical report does demonstrate that pressure within the canister remains within the design basis.
71.43(d)	A package must be made of materials and construction that assure that there will be no significant chemical, galvanic, or other reaction among the packaging components, among package contents, or between the packaging components and the package contents, including possible reaction resulting from in-leakage of water, to the maximum credible extent. Account must be taken of the behavior of materials under irradiation.	2.2.2 and 2.2.3	Potential material interactions that could affect canister integrity are addressed. Inadvertent intrusion of additional water due to canister breach is not credible (see section 2.7.8).
71.43(e)	A package valve or other device, the failure of which would allow radioactive contents to escape, must be protected against unauthorized operation and, except for a pressure relief device, must be provided with an enclosure to retain any leakage.	---	Applies to transportation cask[1].
71.43(f)	A package must be designed, constructed, and prepared for shipment so that under the tests specified in §71.71 ("Normal conditions of transport") there would be no loss or dispersal of radioactive contents, no significant increase in external surface radiation levels, and no substantial reduction in the effectiveness of the packaging.	---	Applies to transportation cask[1].
71.43(g)	A package must be designed, constructed, and prepared for transport so	---	Applies to transportation cask. Surfaces of the DOE Standardized

[1]Prior to transport, DOE standardized SNF canisters are permanently sealed with full penetration structural welds (i.e. no bolts, gaskets, seals, valves, or pressure relief devices). The topical report (sections 2.6 and 2.7.8) demonstrates that the canister will not be breached under either normal conditions of transport or hypothetical accident conditions.

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10 CFR71	Summary of the Requirement(s)	Addressed in Topical Report Section #	Explanation
	that in still air at 38°C (100°F) and in the shade, no accessible surface of a package would have a temperature exceeding 50°C (122°F) in a nonexclusive use shipment, or 85°C (185°F) in an exclusive use shipment.		SNF Canister will not be accessible during transportation.
71.43(h)	A package may not incorporate a feature intended to allow continuous venting during transport	---	Applies to transportation cask[1].
71.45	**Lifting and Tie-Down Standards for all Packages**	---	Applies to the transportation cask.
71.47(a-d)	**External Radiation Standards for all Packages**	---	Applies to the transportation cask.
71.51(a-d)	**Additional Requirements for Type B Packages**: Specifies radiological release and dose limits during normal and hypothetical accident conditions specified in 10CFR71.71 and 10CFR71.73	---	Applies to the transportation cask[1].
71.53	---Reserved ---	---	---
71.55	**General Requirements for Fissile Material Packages**	---	Section Header Only
71.55(a)	This section invokes, for fissile material shipments, 71.41 thru 71.47 and, if a Type B package, 71.51	---	See table entries for 10CFR71.41 thru 71.47, and 71.51
71.55(b)	Except as provided in paragraph (c) or (g) of this section, a package used for the shipment of fissile material must be so designed and constructed and its contents so limited that it would be subcritical if water were to leak into the containment system, or liquid contents were to leak out of the containment system so that, under the following conditions, maximum reactivity of the fissile material would be attained:	2.7.8, 6.1.2, 6.4.1	The applicant for a C of C will address this requirement as it applies to arrays of canisters within a cask. The criticality analyses in the topical report will demonstrate criticality safety for a single canister with a bounding fuel in an as-loaded flooded condition and also in a fully degraded and optimally reconfigured condition in a leaktight canister.
	(1) The most reactive credible configuration consistent with the chemical and physical form of the material;		The topical report will provide analyses that conservatively assume the canister contents are completely degraded and in their most reactive configuration.
	(2) Moderation by water to the most reactive credible extent; and		The applicant for C of C will ensure that the cask performance requirements imposed by 1.1.2 are satisfied, thus ensuring that the moderator intrusion into the canister is not credible under both normal and hypothetical accident conditions.
	(3) Close full reflection of the containment system by water on all sides, or such greater reflection of the containment system as may additionally be provided by the surrounding material of the packaging		The analyses in the topical report conservatively assume that the cask cavity is flooded (i.e. full water reflection on all sides).
71.55(c)	The Commission may approve exceptions to the requirements of paragraph (b) of this section if the package incorporates special design features that ensure that no single packaging error would permit leakage, and if appropriate measures are taken before each shipment to ensure that the containment system does not leak.	---	The DOE is not seeking an exception to the requirements of 71.55(b).
71.55(d)	A package used for the shipment of fissile material must be so designed and constructed and its contents so limited that under the tests specified in §71.71 ("Normal conditions of transport")	---	Section header
	(1) The contents would be subcritical;	6.1.2	Canister contents remain subcritical even if fully degraded and

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10 CFR71	Summary of the Requirement(s)	Addressed in Topical Report Section #	Explanation
		2.6 2.7.8	optimally reconfigured (i.e. maximum reactivity) in a leaktight canister. Challenges to the canister under the tests prescribed by 10CFR71.71 are bounded by the 10CFR71.73 tests. The topical report demonstrates that the canister remains leaktight following the prescribed 71.73 tests.
	(2) The geometric form of the package contents[2] would not be substantially altered;	2.6	---
	(3) There would be no leakage of water into the containment system unless, in the evaluation of undamaged packages under §71.59(a)(1), it has been assumed that moderation is present to such an extent as to cause maximum reactivity consistent with the chemical and physical form of the material; and	---	Applies to transportation cask.
	(4) There will be no substantial reduction in the effectiveness of the packaging, including… (itemized i thru iii)	---	Applies to transportation cask. Section 1.1.2 specifies the cask performance requirements that will ensure that the canister integrity is maintained.
71.55(e)	A package used for the shipment of fissile material must be so designed and constructed and its contents so limited that under the tests specified in §71.73 ("Hypothetical accident conditions"), the package would be subcritical. For this determination, it must be assumed that:	6.1.2, 2.7.8, 6.4.1	See explanation with 71.55(b)
	(1) The fissile material is in the most reactive credible configuration consistent with the damaged condition of the package and the chemical and physical form of the contents;		
	(2) Water moderation occurs to the most reactive credible extent consistent with the damaged condition of the package and the chemical and physical form of the contents; and		
	(3) There is full reflection by water on all sides, as close as is consistent with the damaged condition of the package.		
71.55(f)	For fissile material package designs to be transported by air:	---	Approval is not being sought to transport a loaded DOE Standardized SNF Canister by air.
71.55(g)	Packages containing uranium hexafluoride are excepted provided that ….. (itemized 1 thru 4)	----	---
71.57	----Reserved---	---	---
71.59 (a-c)	**Standards for Arrays of Fissile Materials Packages:** This section provides instructions for calculating a CSI and imposes restrictions on the shipper and/or carrier based on the CSI	---	Applies to transportation cask.

[2] Data to determine the mechanical response of the canister contents is not available in many cases. However, the canister itself is not substantially altered. And because the canister remains leaktight, criticality safety is independent of the geometric form of the canister contents, as shown in section 6.1.2.

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10 CFR71	Summary of the Requirement(s)	Addressed in Topical Report Section #	Explanation
71.61	**Special Requirements for Type B Packages Containing more than 10^5 A_2:** .	2.7.7	Analyses show that canister will withstand the deep water immersion test
71.63	**Special Requirements for Plutonium Shipments:** Shipments containing plutonium must be made with the contents in solid form, if the contents contain greater than 0.74 TBq (20 Ci) of plutonium.	1.2.3	All SNF within the scope of this report will be sealed in a DOE standardized that has been demonstrated to remain leaktight during normal transport and hypothetical accident conditions.
71.64	**Special Requirements for Plutonium Air Shipments:**	---	Approval is not being sought to transport a loaded DOE Standardized SNF Canister by air.
71.65	Additional Requirements: The Commission may, by rule, regulation, or order, impose requirements on any licensee, in addition to those established in this part, as it deems necessary or appropriate to protect public health or to minimize danger to life or property.	---	---
	Subpart F: Package, Special Form, and LSA-III Tests		
71.71	**Normal Conditions of Transport:**	---	Section header
71.71(a)	*Evaluation.* Provides general instructions for completing the tests specified by 71.71	---	See table entries for specific 10CFR71.71 requirements.
71.71(b)	*Initial conditions.* Provides instructions for establishing the initial test conditions with respect to temperature and pressure.	3	---
71.71(c)	*Conditions and tests—*	---	Section header
	(1) *Heat.* An ambient temperature of 38°C (100°F) in still air, and insolation according to the following table:	---	These temperature conditions apply to the outside of the transportation cask. Section 3 of the topical report includes an explanation of how this is addressed with respect to the canister.
	(2) *Cold.* An ambient temperature of −40°C (−40°F) in still air and shade.	---	
	(3) *Reduced external pressure.* An external pressure of 25 kPa (3.5 lbf/in ^{2}) absolute.	---	
	(4) *Increased external pressure.* An external pressure of 140 kPa (20 lbf/in ^{2}) absolute.	---	
	(5) *Vibration.* Vibration normally incident to transport.	2.6	---
	(6) *Water spray.* A water spray that simulates exposure to rainfall of approximately 5 cm/h (2 in/h) for at least 1 hour.	---	Applies to transportation cask.
	(7) *Free drop.*	2.6	This drop is bounded by the free drop analyzed for accident conditions.
	(8) *Corner drop.*	---	Applies only to fiber board, wood, or fissile rectangular packages (<110 lbs) or cylindrical packages less than 220 lbs.
	(9) *Compression.*	---	Applies to transportation cask. Cask protects the canisters from potential compressive loads.
	(10) *Penetration.* Impact of the hemispherical end of a vertical steel cylinder of 3.2 cm (1.25 in) diameter and 6 kg (13 lbs) mass, dropped from a height of 1 m (40 in) onto the exposed surface of the package that is expected to be most vulnerable to puncture. The long axis of the cylinder must be perpendicular to the package surface.	---	The transportation cask protects the canister from puncture loads (section 1.1.2). Puncture tests have nonetheless been performed (section 2.7) and demonstrate additional safety margin.
71.73	**Hypothetical Accident Conditions:**	---	Section header
71.73(a)	*Test procedures.* Evaluation for hypothetical accident conditions is to be	---	Section 2.7 of the topical report describes how the specified test

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	based on sequential application of the tests specified in this section, in the order indicated, to determine their cumulative effect on a package or array of packages. An undamaged specimen may be used for the water immersion tests specified in paragraph (c)(6) of this section.		sequence is applied to the canister
71.73(b)	*Test conditions.* Provides instructions for establishing the initial test conditions with respect to temperature and pressure.	3	---
71.73(c)	*Tests.* Tests for hypothetical accident conditions must be conducted as follows:	---	Section header
	(1) *Free Drop….*	2.7.1	---
	(2) *Crush* …	---	Applies to transportation cask and only to specimens with a mass of 500kg or less. Cask protects the canisters from potential crush loads.
	(3) *Puncture…*	---	The transportation cask protects the canister from puncture loads (section 1.1.2). Puncture tests have nonetheless been performed (section 2.7.3) and demonstrate additional safety margin.
	(4) *Thermal.*……	---	The transportation cask provides a thermal buffer that limits the temperature of the canister wall to 600F (see cask performance requirements specified in section 1.1.2)
	(5) *Immersion—fissile material.* …. of at least 0.9 m (3 ft) in the attitude for which maximum leakage is expected.	2.7.5	Canister meets the deep water immersion test prescribed by 71.61
	(6) *Immersion—all* packages. A separate, undamaged specimen … of at least 15 m (50 ft).	2.7.6	
71.74	**Accident Conditions for Air Transport of Pu:**	---	Approval is not being sought to transport a loaded DOE Standardized SNF Canister by air.
71.75	**Qualifications for Special form Radioactive Material:**	---	A classification of "Special Form Radioactive Material" is not being sought for DOE Standardized SNF Canisters.
71.77	**Qualification of LSA-III Material"**	---	A classification of "LSA-III Material" l is not being sought for DOE Standardized SNF Canisters.
	Subpart G: Operating Controls and Procedures		
71.81	**Applicability of Operating Controls and Procedures**: A licensee subject to this part, who, under a general or specific license, transports licensed material or delivers licensed material to a carrier for transport, shall comply with the requirements of this subpart G, with the quality assurance requirements of subpart H of this part, and with the general provisions of subpart A of this part.	---	See table entries associated with the requirements of subparts G, H, and A.
71.83	Assumptions as to Unknown Properties: When the isotopic abundance, mass, concentration, degree of irradiation, degree of moderation, or other pertinent property of fissile material in any package is not known, the licensee shall package the fissile material as if the unknown properties have credible values that will cause the maximum neutron multiplication.	6.2	The TR will demonstrate that conservative assumptions were used within the criticality analyses
71.85	**Preliminary Determinations**: Before the first use of any packaging for the shipment of licensed material—	---	Section header

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	(a) The licensee shall ascertain that there are no cracks, pinholes, uncontrolled voids, or other defects that could significantly reduce the effectiveness of the packaging;	8.1	With respect to the canister, this is satisfied by the weld tests and subsequent leak checks associated with the sealing process for each canister and the canister labeling requirements
	(b) Where the maximum normal operating pressure will exceed 35 kPa (5 lbf/in ^{2}) gauge, the licensee shall test the containment system at an internal pressure at least 50 percent higher than the maximum normal operating pressure, to verify the capability of that system to maintain its structural integrity at that pressure; and	8.1	
	(c) The licensee shall conspicuously and durably mark the packaging with its model number, serial number, gross weight, and a package identification number assigned by NRC. Before applying the model number, the licensee shall determine that the packaging has been fabricated in accordance with the design approved by the Commission.	2.1.2	
71.87	**Routine Determinations:** Before each shipment of licensed material, the licensee shall ensure that the package with its contents satisfies the applicable requirements of this part and of the license. The licensee shall determine that—	---	The process for loading of canisters into the transportation cask and any associated routine determinations will be addressed in an application for a C of C for the future transportation package.
71.87(a)	The package is proper for the contents to be shipped;	2.1.2, 2.2, and 1.2.2	With respect to the canister, this is satisfied by criteria for the canister and its contents that ensure it will not be compromised during interim storage and/or breached during transportation.
71.87(b)	The package is in unimpaired physical condition except for superficial defects such as marks or dents;	7.1, 8.2, and 1.1.2	With respect to the canister, this is satisfied by implementing operating controls and procedures for loading, sealing, inspecting, and handling DOE Standardized SNF canisters and by a monitoring and sampling program to confirm that canister integrity is not jeopardized during the interim storage period. As identified in section 1.1.2, confirmation of the physical condition of the canister is identified as a prerequisite for crediting the conclusions of the topical report.
71.87(c)	Each closure device of the packaging, including any required gasket, is properly installed and secured and free of defects;	---	Applies to cask. Note: Canister is permanently seal welded (i.e. no bolts, gaskets, or other closure devices)
71.87(d)	Any system for containing liquid is adequately sealed and has adequate space or other specified provision for expansion of the liquid;	---	Canisters contents will be dried before canisters are sealed.
71.87(e)	Any pressure relief device is operable and set in accordance with written procedures;	---	Applies to cask. Note: DOE Standardized SNF Canisters will be permanently sealed prior to shipment.
71.87(f)	The package has been loaded and closed in accordance with written procedures;	---	Applies to cask. Note: The canister closure process and associated acceptance criteria are discussed in the topical report in sections 7.1 and 8.1,

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			respectively.
71.87(g)	For fissile material, any moderator or neutron absorber, if required, is present and in proper condition;	6.1	Neutron absorber material is not required to ensure criticality for the flooded as-loaded case or for any of the potential reconfigurations in a leaktight canister.
71.87(h)	Any structural part of the package that could be used to lift or tie down the package during transport is rendered inoperable for that purpose, unless it satisfies the design requirements of §71.45;	---	Applies to transportation cask
71.87(i)	The level of non-fixed (removable) radioactive contamination on the external surfaces of each package offered for shipment is as low as reasonably achievable, and within the limits specified in DOT regulations in 49 CFR 173.443;	---	Applies to transportation cask
71.87(j)	External radiation levels around the package and around the vehicle, if applicable, will not exceed the limits specified in §71.47 at any time during transportation; and	---	Applies to transportation cask
71.87(k)	Accessible package surface temperatures will not exceed the limits specified in §71.43(g) at any time during transportation.	---	Applies to transportation cask Note: Canister surfaces will not be accessible
71.88	**Air Transport of Plutonium:**	---	Approval is not being sought to transport a loaded DOE Standardized SNF Canister by air.
71.89	**Operating Instructions:** Before delivery of a package to a carrier for transport, the licensee shall ensure that any special instructions needed to safely open the package have been sent to, or otherwise made available to, the consignee for the consignee's use in accordance with 10 CFR 20.1906(e).	---	Applies to opening of the transportation cask. DOE Standardized SNF Canisters are seal-welded with no intention of being opened.
71.91	**Records**:	---	Section header
71.91(a)	Each licensee shall maintain, for a period of 3 years after shipment, a record of each shipment of licensed material not exempt under §71.10, showing where applicable …. [itemized (1) thru (10)]	---	Will be addressed in the license application for the future transportation package
71.91(b)	Each certificate holder shall maintain, for a period of 3 years after the life of the packaging to which they apply, records identifying the packaging by model number, serial number, and date of manufacture.	1.1.2, 2.3, 7, 8	The standardized canister will be loaded and stored in DOE facilities prior to transportation and disposal under NRC regulatory authority. Handling and storage of canisters within DOE facilities will be conducted in accordance with the governing procedures and DOE Orders. Because the NRC has a regulatory interest in canister fabrication and operations that may affect its ability to perform its credited safety function, the topical report will propose the following: 1. Records possessed by NSNFP that are required to support
71.91(c)	The licensee, certificate holder, and an applicant for a C of C, shall make available to the Commission for inspection, upon reasonable notice, all records required by this part. Records are only valid if stamped, initialed, or signed and dated by authorized personnel, or otherwise authenticated.		
71.91(d)	The licensee, certificate holder, and an applicant for a C of C shall maintain sufficient written records to furnish evidence of the quality of packaging. The records to be maintained include results of the determinations required by §71.85; design, fabrication, and assembly records; results of reviews, inspections, tests, and audits; results of monitoring work performance and materials analyses; and results of maintenance, modification, and repair		

Crosswalk: 10CFR71 Requirements to Applicable Section of Topical Report

10 CFR71	Summary of the Requirement(s)	Addressed in Topical Report Section #	Explanation
	activities. Inspection, test, and audit records must identify the inspector or data recorder, the type of observation, the results, the acceptability, and the action taken in connection with any deficiencies noted. These records must be retained for 3 years after the life of the packaging to which they apply.		the topical report are maintained in accordance with DOE/RW-0333P QA requirements . Ultimately, these records will be turned over to OCRWM for retention.
71.93	**Inspections and Tests:**		
71.93(a)	The licensee, certificate holder, and applicant for a C of C shall permit the Commission, at all reasonable times, to inspect the licensed material, packaging, premises, and facilities in which the licensed material or packaging is used, provided, constructed, fabricated, tested, stored, or shipped.		2. NRC will be notified and invited to observe canister fabrication and loading activities.
71.93(b)	The licensee, certificate holder, and applicant for a C of C shall perform, and permit the Commission to perform, any tests the Commission deems necessary or appropriate for the administration of the regulations in this chapter.		3. Any instances of safety significant defects or other occurrences (during canister fabrication, loading, or subsequent storage) that may jeopardize the ability of the canister to meet its performance requirements will be documented in accordance with the governing QA program program (e.g. 10CFR72 Subpart G, 10CFR71 Supbart H, and/or DOE/RW-0333P).
71.93(c)	The certificate holder and applicant for a C of C shall notify the NRC, in accordance with §71.1, 45 days in advance of starting fabrication of the first packaging under a C of C. This paragraph applies to any packaging used for the shipment of licensed material which has either— (1) A decay heat load in excess of 5 kW; or (2) A maximum normal operating pressure in excess of 103 kPa (15 lbf/in ^{2}) gauge.		4. Records that demonstrate that canister fabrication, handling, loading, and storage meet the conditions prescribed by the topical report will be maintained by the SNF storage site in accordance with the governing QA and made available to the licensee (OCRWM) to furnish evidence of the quality of the packaging and to demonstrate compliance with applicable acceptance requirements.
71.95	**Reports**:	---	Section header
71.95(a)	The licensee, after requesting the certificate holder's input, shall submit a written report to the Commission of— (1) Instances in which there is a significant reduction in the effectiveness of any NRC-approved Type B or Type AF packaging during use; or (2) Details of any defects with safety significance in any NRC-approved Type B or fissile material packaging, after first use. (3) Instances in which the conditions of approval in the Certificate of Compliance were not observed in making a shipment.	---	Applies to incidents that occur at or after time of shipment.
71.95(b)	The licensee shall submit a written report to the Commission of instances in which the conditions in the certificate of compliance were not followed		

Crosswalk: 10CFR71 Requirements to Applicable Section of Topical Report

10 CFR71	Summary of the Requirement(s)	Addressed in Topical Report Section #	Explanation
	during a shipment.		
71.95(c)	Outlines the requirements for the reports required by 71.95 (a and b)		
71.97	**Advance Notification of Shipment of Irradiated Fuel and Nuclear Waste:**	---	---
71.99	**Violations:**	---	Section header
71.100	**Criminal Penalties**	---	---
	Subpart H: Quality Assurance		
71.101	**Quality Assurance Requirements:**	1.1.2	While NSNFP is not the designer of record for packaging or the DOE standardized canister, NSNFP implements OCRWM DOE/RW-0333P QA requirements for design control as it applies to analysis supporting the topical report. DOE/RW-0333P is under the purview of the NRC as part of the Yucca Mountain Project license application activities. The DOE standardized SNF canister design will be made available to DOE SNF sites for their use when repackaging SNFs for interim storage and/or preparing them for repository disposition. The topical report specifies that procurement and/or fabrication of canisters, canister loading, storage, handling, and preparation for shipping must comply with the conditions prescribed by the topical report (i.e. the approved design, a QA program that satisfies subpart H, etc.) in order for the canisters to be within the scope of the topical report.
71.103	**Quality Assurance Organization:**	1.1.2	
71.105	**Quality Assurance Program:**	1.1.2	
71.107	**Package Design Control**	1.1.2	
71.109	**Procurement Document Control**	1.1.2	
71.111	**Instructions, Procedures, and Drawings**	1.1.2	
71.113	**Document Control**	1.1.2	
71.115	**Control of Purchased Material, Equipment, and Services**	1.1.2	
71.117	**Identification and Control of Materials, Parts, and Components**	1.1.2	
71.119	**Control of Special Processes**	1.1.2	
71.121	**Internal Inspection**	1.1.2	
71.123	**Test Control**	1.1.2	
71.125	**Control of Measuring and Test Equipment:**	1.1.2	
71.127	**Handling, Storage, and Shipping Control:**	1.1.2	
71.129	**Inspection, Test, and Operating Status:**	1.1.2	
71.131	**Nonconforming Materials, Parts, or Components:**	1.1.2	
71.133	**Corrective Action:**	1.1.2	
71.135	**Quality Assurance Records:**	1.1.2, 2.3, 7.1	
71.137	**Audits:**	1.1.2	