

Cross Reference Table Between the Regulation  
Paragraphs and The Safety Analysis Report  
Paragraphs



**Nuclear Fuel Industries, Ltd.**

Type	Items of IAEA regulation	Applicable paragraphs of the safety analysis report	Justifications
General Requirements	607	Chapter I - C (12)	The package is designed as object which can be transported by generally used vehicles or transporting devices such as forklift and pallet trucks. The package is equipped with lifting attachments on the four corners of the lid of the outer receptacle which can be manipulated with hooks of a crane or a chain block to lift the package. Thus, the package can be handled with ease and in safety.
	608	Chapter II - A.4.4	No failure of lifting attachments in routine conditions of transport and no impact on safety if failure occurs.
	609		
	610	Chapter I - C (11)	The only protruding portions of the package are its legs provided on the external bottom surface of the outer receptacle. These legs are useful elements of the package; they serve as positioning blocks when two packages of this model are stacked one on top of another. The package can easily be decontaminated since the external surfaces of the package are configured with stainless steel plates.
	611	Chapter I - C (6)	The global rectangular shape of the packaging prevents any retention of water.
	612	Not applicable	There are no features added to the package during transport.
	613	Chapter II - A.4.7	The package strength under routine conditions of transport is ensured.
	614	Chapter I - D (3) and Chapter II - A.4.1	Materials are compatible with each other and with the radioactive contents.
	615	<i>Not applicable</i>	<i>Package has no valve.</i>
	616	Chapter II - A.4.6 and Chapter II - B.4	The design takes into account ambient temperatures and pressures for routine conditions of transport.

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General Requirements	617	Chapter II - D	The dose equivalent rate on the external surfaces of the package is 0.028 mSv/h or less and will never exceed 2 mSv/h. The dose equivalent rate at any location one meter from any of the external surfaces of the package is 2.56 $\mu$ Sv/h or less and will never exceed 100 $\mu$ Sv/h.
	618	<i>Not applicable</i>	<i>The radioactive materials do not have any other dangerous properties.</i>
Transport by air	619 to 621	<i>Not applicable</i>	<i>The package is not transported by air.</i>
Requirements for Type A packages	636	Chapter I - C	The package has the external dimensions: 1144 mm in length, 830 mm in width, and 1060 mm in height.
	637	Chapter II - A.4.3 and Chapter IV - A	The inner receptacle and the outer receptacle of the package are firmly connected with their respective lid by means of rod bolts. Tools such as wrench should be used to loosen or tighten these rod bolts, and a crane or other hoisting devices is required to remove the lid of the outer receptacle. Thus, there is no room for erroneous opening of the lid. Once the outer receptacle has been joined with the lid, a seal is applied to a zone covering both the lid and the body of the outer receptacle. In case that the outer receptacle is opened, the operation of opening becomes objectively visible.
	638	Chapter I - C	The package can be attach with tie down devices.

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Requirements for Type A packages	639	Chapter II - A.4.2 and B.3	The brittle temperature for the silicone rubber provided at the containment boundary of the package is lower than $-50^{\circ}\text{C}$ . Thus, the material will not suffer cracking or fracture in an environment of $-40^{\circ}\text{C}$ . The same silicone rubber can resist a temperature of $180^{\circ}\text{C}$ . Therefore, it will not suffer cracking or fracture in an environment of $+70^{\circ}\text{C}$ .
	640	Chapter I - Table I-1	The GP-01 package is in accordance with the following standards: IAEA, JIS for the design and manufacturing.
	641	Chapter II - A.4.3	The inner receptacle of the package is firmly connected with their respective lid by means of rod bolts.
	642	<i>Not applicable</i>	<i>The package does not contain any special form radioactive material.</i>
	643	<i>Not applicable</i>	<i>The containment system is a part of the package.</i>
	644	<i>Not applicable</i>	<i>There is no internal power in the cavity.</i>
	645	Chapter II - A.4.6	The calculated stresses do not exceed stress limits.
	646	<i>Not applicable</i>	<i>Package has no valve.</i>
	647	<i>Not applicable</i>	<i>Package has no separated radiation shield.</i>
	648(a)	Chapter II - A.5	<i>There is no loss or dispersal of the radioactive contents observed after normal conditions tests.</i>
	648(b)	Chapter II - D	<i>Normal conditions of transport do not increase the maximum radiation level at the external surface of the package by more than 20 %.</i>
	649	<i>Not applicable</i>	<i>The package does not contain liquids.</i>
	650	<i>Not applicable</i>	<i>The package does not contain liquids.</i>
651	<i>Not applicable</i>	<i>The package does not contain gases.</i>	

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Requirements for package containing fissile materials	673(a)	Chapter II - E	All the hypotheses taken into account are described and justified.
	673(b)(i)	Chapter I - C	The package has the external dimensions: 1144 mm in length, 830 mm in width, and 1060 mm in height.
	673(b)(iii)	Chapter II - A.4.3 and Chapter IV - A	The inner receptacle and the outer receptacle of the package are firmly connected with their respective lid by means of rod bolts. Tools such as wrench should be used to loosen or tighten these rod bolts, and a crane or other hoisting devices is required to remove the lid of the outer receptacle. Thus, there is no room for erroneous opening of the lid. Once the outer receptacle has been joined with the lid, a seal is applied to a zone covering both the lid and the body of the outer receptacle. In case that the outer receptacle is opened, the operation of opening becomes objectively visible.
	570 674 675	<i>Not applicable</i>	<i>The package is not excepted from the requirements for package containing fissile material.</i>
	676	Chapter II - E	The fissile contents are known and described.
	677	<i>Not applicable</i>	<i>The package contents are not irradiated fuel.</i>
	678(a) 678(b)	Chapter II - A.9.1.4	The package keeps its integrity after normal conditions tests.

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Requirements for package containing fissile materials	679	Chapter II - A.4.2, B.4.3 and B.4.2	<p>The package is constructed with metallic materials, mainly stainless steels as structural elements. The brittle temperature for the silicone rubber provided at the containment boundary of the package is lower than <math>-50^{\circ}\text{C}</math>. These materials will not suffer cleft or fracture in an environment of <math>-40^{\circ}\text{C}</math>.</p> <p>These metallic materials and the silicone rubber which resists a temperature of <math>180^{\circ}\text{C}</math> will not suffer cleft or fracture in an environment of <math>+38^{\circ}\text{C}</math>. Thus, the package will not suffer cleft or fracture at temperatures ranging from <math>-40^{\circ}\text{C}</math> to <math>+38^{\circ}\text{C}</math>.</p>
	680(a)	Chapter II - E	The leakage of water into the containment vessel has been taken into account in the criticality analysis.
	680(b)	<i>Not applicable</i>	<i>The package does not contain uranium hexafluoride.</i>
	681	Chapter II - E.3.1	Specular reflection is considered in the study.
	682	Chapter II - E3.1	Calculations are made with the damaged package.
	683	<i>Not applicable</i>	<i>The package is not transported by air.</i>
	684(a)	Chapter II - E3.1	Number N obtained considering normal and accidental conditions of transport, isolated and array of packages is infinite.
	684(b)		
	685(a)		
	685(b)		
685(c)	Chapter II - A.9.2	The rod bolts do not break, the lid of the inner receptacle remains in the initial position, and the contents are not released outside from the inner receptacle.	
686	Chapter I - A and Chapter II - E3.1	CSI is 0.	

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Normal conditions of transport	721	Chapter II - A.5.2	The global cubical shape of the packaging prevents any collection or retention of water. The water spray test is not realised.
	722	Chapter II - A.5.3	Drop test height is fixed at 1.2 m because the package mass is less than 5,000 kg.
	723	Chapter II - A.5.4	The package complies with the stacking test.
	724	Chapter II - A.5.5 and Appendix 1 - 4.3.2	Package is not affected by this test (test performed).
Accident conditions of transport	727	Chapter II - A.9.2	The most penalizing cases are taken into account during the drop tests and the mechanical analysis.
	728	Chapter II - B.5	The package is subjected to the regulatory fire conditions (test performed).
	729	Chapter II - A.9.2	Package is not leak tight and water immersion is taken into account in the criticality study.
Requirements and controls for transport	501(a)	<i>Not applicable</i>	<i>The package is not designed to withstand pressure over 35 kPa.</i>
	501(b)	Chapter III - E	The acceptance and test program ensures compliance of shielding, containment and neutron poison system.
	501(c)		
	502 and 503(a)	Chapter IV - A.2	The tests and certificates before transport are described in Chapter IV - A.2
	503(b) (c)(d)	<i>Not applicable</i>	<i>The package is not:</i> - <i>loaded with special form or low dispersible radioactive material,</i> - <i>loaded with uranium hexafluoride,</i> - <i>loaded with irradiated material,</i> - <i>a type B or a type C package.</i>
	504 to 506	<i>Not applicable</i>	<i>The package does not transport any other goods.</i>
	507	<i>Not applicable</i>	<i>The content does not have any other dangerous properties.</i>
Requirements	508 to 509	Chapter IV - A.2	A non-contamination check of the external

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and controls for transport			surfaces of the cask is realised before the package transport.
	515 to 516	<i>Not applicable</i>	<i>The package is not excepted.</i>
	517 to 528	<i>Not applicable</i>	<i>The package transports neither LSA or SCO material.</i>
Approval and Administrative requirements	803 to 813	<i>Not applicable</i>	The package is not : <ul style="list-style-type: none"> <li>- loaded with special form or low dispersible radioactive material,</li> <li>- loaded with uranium hexafluoride,</li> <li>- a type B or a type C package.</li> <li>- excepted from "fissile" classification</li> </ul>
	814 to 816	Out of scope of the Safety Analysis Report	The package transportation is only carried out with a valid approval certificate from the competent authority as well as an authorisation given by each country that is crossed during transport.
Management system	306 (a) (b)	Chapter III	The management system for the GP-01 package is presented in this chapter.