<table>
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<th>Comment No.</th>
<th>Para No.</th>
<th>Proposed Change/new regulatory text</th>
<th>Discussion/Reason</th>
<th>Recommendation/Reason for modification/rejection</th>
<th>WG resolution</th>
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<td>34</td>
<td>680</td>
<td>Requiring the absence of interaction between the plug and other components of the package.</td>
<td>It is allowed by paragraph 680 b) i) not to consider water penetration within packages where, following the tests defined in para. 685(b), there is no physical contact between the valve and any other component of the packaging other than at its original point of attachment and where, in addition, following the test prescribed in para. 728, the valves remain leaktight.</td>
<td>This is a major change in design requirement and should be considered by the revision cycle through discussion at a TM.</td>
<td>WG 1 Discussion: General agreement that the issue should be examined in light of consequences that may follow from any change in this area.</td>
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Text revisions (SSR-6): 680. For a package in isolation, it shall be assumed that water can leak into or out of all void spaces of the package, including those within the containment system. However, if the design incorporates special features to prevent such leakage of water into or out of certain void spaces, even as a result of error, absence of leakage may be assumed in respect of those void spaces. Special features shall include either of the following: 
(a) Multiple high standard water barriers, not less than two of which would remain watertight if the package were subject to the tests prescribed in para. 685(b), a high degree of quality control in the manufacture, maintenance and repair of packagings, and tests to demonstrate the closure of each package before each shipment; or 
(b) For packages containing uranium hexafluoride only, with a maximum uranium enrichment of 5 mass per cent uranium-235: 
   (i) Packages where, following the tests prescribed in para. 685(b), there is no physical contact between the valve and the plug and any other component of the packaging other than at its original point of attachment and where, in addition, following the test prescribed in para. 728, the valves and the plug remain leaktight;

Assessment of package designs for transport of UF₆ in 30B cylinders has shown in some cases that there could be contact between overpack and plug surface when subjected to 1 m or 9 m drop tests. In such cases it is not obvious that the plug would remain perfectly leaktight which implies some uncertainty about criticality-safety. We propose that the plug of 30 cylinders which has the same safety function as the valve, and might be subjected to some mechanical interaction with other components of the package should also be included in the requirements of 680 b) i).

NOTE: Some proposals from this group will feed into other WGs in TRANSSC-28 after having the opinion of criticality experts.
(ii) A high degree of quality control in the manufacture, maintenance and repair of packagings, coupled with tests to demonstrate closure of each package before each shipment.

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<th>No.</th>
<th>Country</th>
<th>Reference Numbers</th>
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<td>35</td>
<td>France</td>
<td>729, 659, 667, 685, 730, 660, 667, 670, 733</td>
<td>Increase the duration of the 15m and 0.9m water leakage tests for packages. It is proposed that the issues be discussed in detail by the Technical Committee that should meet from 15 to 19 July 2013 in Vienna.</td>
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3.1 TEST DURATION OF THE 15 M WATER IMMERSION TEST

The regulations requires to take into account the consequences of a water immersion test under 15 m for at least 8 hours (§ 729) on the release of radioactive contents for Type B(U) (§ 659 b)) and B(M) (§ 667) packages and for evaluation of the maximum neutron multiplication for packages containing fissile material (§ 685). This test simulates an accident resulting in submersion of a package in a canal or river under a depth of water bounding the vicinity of most bridges, roadways or harbours.

This scenario also aims at ensuring the absence of mechanical failure for type B packages (para.683).

Duration of water immersion test appears too optimistic compared to the duration probably needed to retrieve submerged packages that include delays for arrival of

This proposal is a major change and should be considered by the revision cycle taking into account the recommendations of the TM-44891 on Transport Environment held in July 2013.

WG 1 Discussion: General agreement that the issue should be carried forward to a TM or Working group for discussion.
A French study whose results were presented at the PATRAM 98 conference: “Assessment of the consequences of accidental burial into soft ground of a spent fuel transport container” showed that for spent fuel packages that could sink below the surface of a marsh it would take at least several days to lift them back to surface.

Furthermore, the recovery of UF6 cylinders housed in the cargo hold of the Mont-Louis which sank off Ostend in 1984 and based on a sandbank by 15 meter depth at low tide took 40 days (see http://www.iaea.org/Publications/Magazines/Bulletin/Bull271/French/27104592832_fr.pdf).

Another accident involving a spent fuel cask tipped over in the soft ditch resulted in 1987 at Lailly-en-Val (France) in partial burying of the package at a depth of 1m and 2 days were needed to lift the package back to dry location.

It could therefore be envisaged to increase the duration of the 15 m
In practice, prolonged water immersion may affect the amount of water entering the package, which can lead to an increase in reactivity when a package containing fissile material is immersed at 15 m.

3.2 TEST DURATION OF THE 200 M ENHANCED WATER IMMERSION TEST
The regulations require to take into account the consequences of an enhanced water immersion test under 200 m of water for at least 1 hour (§ 730) for Type B(U) (§ 660) or B(M) (§ 667) whose content is characterized by an activity greater than 105 A2 and Type C packages (§ 670), to evaluate the mechanical strength of the containment system.

This test simulates the sinking of a ship carrying a package on the continental shelf (200 m). In addition to preventing important releases of radioactivity in shallow waters close to human activities it also aims at ensuring protection of divers responsible for conducting recovery operations from any mechanical failure of the package that would lead to sudden release of radioactive material close to the
Durations of water immersion test appear too optimistic compared to the time probably needed to retrieve packages submerged at this depth.

The recovery of UF6 cylinders housed in the cargo hold of the Mont-Louis which sank off Ostend in 1984 and based on a sandbank by 15 meter depth at low tide took 40 days (see http://www.iaea.org/Publications/Magazines/Bulletin/Bull271/French/27104592832_fr.pdf).

It could therefore be envisaged to increase the duration of the 200 m enhanced water immersion test. Since the new time period may imply corrosion phenomena, it is also proposed to define a degree of salinity and an oxygen concentration of water for this test.

3.3 TEST DURATION OF THE 0.9 M WATER LEAKAGE TEST
The regulations require taking into account the consequences of the water leakage test under 0.9 m for at least 8 hours (§ 733) following the accident sequence of drop tests and thermal test for packages containing fissile material, for evaluation of the
maximum neutron multiplication. This test simulates shallow water caused by flooding or by water used to extinguish fire.

Duration of water immersion test appears too optimistic compared to the duration probably needed to retrieve partly submerged packages taking into account delays for arrival of rescue teams and preparation of equipment needed for package lifting.

As already presented above the accident of Lailly-en-Val (France) involving a spent fuel cask tipped over in the soft ditch in resulted in partial burying of the package at a depth of 1m and 2 days were needed to lift the package back to dry location.

In practice, prolonged water immersion may affect the amount of water entering the package, which can lead to an increase in reactivity of packages containing fissile material.

It could therefore be envisaged to increase the duration of the 0.9 m water leakage test.

As a whole it appears that some of the parameters of the IAEA regulatory water immersion tests...
| 39 | F/1.00/16 | 530, 541 | It is proposed to allow a CSI value on the label 7E greater than or equal to the CSI stated in the certificates of approval applicable in the various countries concerned by the consignment. Text revisions (SSR-6): MARKING, LABELLING AND PLACARDING 530. For each package or overpack, the UN number and proper shipping name shall be determined (see Table 1). In all cases of international transport of packages requiring competent authority approval of design or shipment, for which different approval features have been stated in the different countries concerned by the shipment, the UN number, proper shipping name, categorization, labelling and marking shall be in accordance with the certificate of the country of origin of design, while paragraph 541 specifies that the CSI has to be as stated in the certificate of approval applicable in the countries through or into which the consignment is transported and issued by the competent authority. Application of para. 541 leads to additional doses to workers that would have to change the labelling at the border between countries. Application of para. 530 would raise issue in countries where the CSI is greater than the CSI stated by... Labelling for criticality safety 541. Each label conforming to the model in— may be questionable with regard to what can be imagined as reasonably credible accidents in transport. Consistently with the complementary safety approach adopted after the Fukushima accident (stress test approach), the above issues could be examined during an appropriate technical meeting organized by the IAEA Agency. There are, for international transports, as regards the CSI, inconsistency between paras. 530 and 541. Para. 530 specifies that the labelling (which includes the CSI value) shall be in accordance with the certificate of the country of origin of design, while paragraph 541 specifies that the CSI has to be as stated in the certificate of approval applicable in the countries through or into which the consignment is transported and issued by the competent authority. Application of para. 541 leads to additional doses to workers that would have to change the labelling at the border between countries. Application of para. 530 would raise issue in countries where the CSI is greater than the CSI stated by... This is a major change and should be considered by revision cycle. WG 1 Discussion: An inconsistency was acknowledged by the chair but there was not agreement on the solution. WG proposed to explore issue.

**NOTE:** Some proposals from this group will feed into other WGs in TRANSSC-28 after having the opinion of criticality experts.
Fig. 5 shall be completed with the a CSI greater than or equal to the one as stated in the certificate of approval applicable in the country through or into which the consignment is transported and issued by the competent authority or as specified in para. 674 or para. 675.

| 57 | 423, 424, 427, 622 | Indicate limitation to fissile-excepted material for UN2908, UN2910 and UN2911 in paras 423, 424 and 427. Indicate in para. 622 that, when fissile-excepted material is contained, para. 636 has to be met. Text revisions (SSR-6): 423. Radioactive material that is enclosed in or is included as a component part of an instrument or other manufactured article, may be classified under UN 2911 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – INSTRUMENTS or ARTICLES, provided that: (a) the radiation level at 10 cm from any point on the external surface of any unpackaged instrument or article is not greater than 0.1 mSv/h; (b) each instrument or article bears the marking “RADIOACTIVE” on its external surface except for the following: (i) Radioluminescent timepieces or devices do not require markings. (ii) Consumer products that have either received regulatory approval in accordance with para. 107(e) or do not individually exceed the activity limit for an exempt consignment in Table 2 (column 5) do not. Except in the case of UN3507, no information is given in paras 423 (UN2911), 424 (UN2910) and 427 (UN2908) about the limitation to fissile-excepted material (para. 417) in these excepted packages, while this is required in para. 515. In the same manner, there is no information given in part VI on the fact that when fissile-excepted material is contained, para. 636 is applicable as specified in para. 515. Except for UN3507, the proper shipping names of those UN numbers (UN2910, UN2911 and UN2908) do not mention the description “non fissile or fissile excepted” as it is done for the other proper shipping names in table 1. This leads to confusion among CAs, consignors and operators about the possibility to accept fissile-excepted material within excepted packages. About the possibility that an.

This is a detail change requiring clarification and should be considered by revision cycle. WG 1 Discussion: proposal should move forward may require expert discussion (TM/CS).
require markings, provided that such products are transported in a package that bears the marking “RADIOACTIVE” on its internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.

(iii) Other instruments or articles too small to bear the marking “RADIOACTIVE” do not require markings, provided that they are transported in a package that bears the marking “RADIOACTIVE” on its internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.

(c) The active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material shall not be considered to be an instrument or manufactured article);

(d) The limits specified in columns 2 and 3 of Table 4 are met for each individual item and each package, respectively;

(e) For transport by post, the total activity in each excepted package shall not exceed one tenth of the relevant limits specified in column 3 of Table 4;

(f) If the package contains fissile material, one of the fissile exceptions provided by para. 417 shall apply. 424. Radioactive material in forms other than as specified in para. 423 and with an activity not exceeding the limits specified in column 4 of Table 4 may be classified under UN 2910, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – LIMITED QUANTITY OF MATERIAL, provided that:

(a) The package retains its radioactive empty packaging having previously contained fissile material exceeds the limit of 3.5 g of U-235 due to its internal contamination, the following case is developed:

- Following specific activity given in TS-G-1.1 in table II.3, U enriched to 5% has an activity of 1 105 Bq/g (activity of U-234 + U-234 + U-238). The quantity of 3.5 g of U-235 corresponds to 3.5/0.05 = 70 g of U enriched to 5%. The corresponding activity is 7 MBq.

- In the case where the material is considered as being low alpha emitters and beta emitters, then the limit of surface contamination for the internal surface is of 400 Bq/cm².

- With this contamination level the area needed to reach 7 MBq is of about 1.75 10⁴ cm², that is to say 1.75 m². Internal surface of a 30B cylinder commonly used to carry enriched hexafluoride uranium up to 5% in U-235, exceeds this area.
contents under routine conditions of transport;
(b) The package bears the marking "RADIOACTIVE" on either:
   (i) An internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package; or
   (ii) The outside of the package, where it is impractical to mark an internal surface.
(c) For transport by post, the total activity in each excepted package shall not exceed one tenth of the relevant limits specified in column 4 of Table 4.
(d) If the package contains fissile material, one of the fissile exceptions provided by para. 417 shall apply.

427. An empty packaging that had previously contained radioactive material may be classified under UN 2908, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – EMPTY PACKAGING, provided that:
(a) It is in a well-maintained condition and securely closed.
(b) The outer surface of any uranium or thorium in its structure is covered with an inactive sheath made of metal or some other substantial material.
(c) The level of internal non-fixed contamination does not exceed 100 times the levels specified in para. 508.
(d) Any labels that may have been displayed on it in conformity with para. 538 are no longer visible.
(e) If the packaging has contained fissile material, one of the fissile exceptions

FISSILE OR FISSILE EXCEPTED MATERIAL (WG meeting May 12-16, 2014 – To be led by Cecil Parks (US))
NOTE: Some proposals from this group will feed into other WGs in TRANSSC-28 after having the opinion of criticality experts.
| TME/1.00/1 | 685, 733 | 685. A number N shall be derived, such that two times N packages shall be subcritical for the arrangement and package conditions that provide the maximum neutron multiplication consistent with the following:
(a) Hydrogenous moderation between the packages and the package arrangement reflected on all sides by at least 20 cm of water.
(b) The tests specified in paras 719–724 followed by whichever of the following is the more limiting:
(i) The tests specified in para. 727(b) and either para. 727(c) for packages having a mass not greater than 500 kg and an overall density not greater than 1000 kg/m³ based on the external dimensions or para. 727(a) for all other packages, followed by the test specified in para. 728 and completed by the tests specified in paras 731–733; or
(ii) The test specified in para. 729 with an enhanced testing time of 1 week instead of the value of 8 hours given in para. 729. | Modifying the immersion test see paras 729/733, see proposal 35. Also see proposal 36 related to crush test.
729: Proposal to change the duration of the immersion test from 8 hours to about one week. Modification proposed by the Working Group to change para 685 instead to limit the change to fissile material. To be considered further during the review process by TRANSSC.
733: Proposal to change the duration of the immersion test from 8 hours to about one week. Modification proposed by the WG to change para 685 instead to limit the change to fissile material. To be considered further during the review process by TRANSSC. | DUPLICATE
Major change – discussed during TM on Environment.
The Secretariat propose to form a Working Group/Consultancy to evaluate the proposal
WG 1 Discussion: Already discussed |
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<th>(c) Where any part of the fissile material escapes from the containment system following the tests specified in para. 685(b), it shall be assumed that fissile material escapes from each package in the array and that all of the fissile material shall be arranged in the configuration and moderation that results in the maximum neutron multiplication with close reflection by at least 20 cm of water.</th>
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<td>733. The specimen shall be immersed under a head of water of at least 0.9 m for a period of not less than 1 week and in the attitude for which maximum leakage is expected.</td>
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