

Sub-Committee of Experts on the
Transport of Dangerous Goods
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Harmonization with the International Atomic Energy Agency (IAEA)
Regulations for the Safe Transport of Radioactive Material

Revision of the IAEA Regulations for the Safe Transport of Radioactive Material

Status Report
15 May 2001
**marked up for corresponding
changes to the UN Model Regulations**

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FOREWORD FOR PRESENTATION TO THE 19th SESSION OF THE UN SUB-COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS

In accordance with its statutory function the International Atomic Energy Agency (IAEA) has established and maintained the “Regulations for the Safe Transport of Radioactive Material” (the IAEA Transport Regulations). The last edition of these regulations, was approved by the IAEA Board of Governors in 1996. The 1996 edition of the IAEA Transport Regulations is also known as “ST-1”. The United Nations (UN) Recommendations on the Transport of Dangerous Goods used to refer to the IAEA Transport Regulations for the provisions concerning Class 7 - Radioactive Materials. Following the publication of ST-1 joint efforts were undertaken to include all the requirements of the IAEA Transport Regulations into the UN Recommendations on the Transport of Dangerous Goods which at that time were being reformatted into Model Regulations. These efforts included reformatting the requirements of the IAEA Transport Regulations into the format of the UN Model Regulations, without changing the requirements of the IAEA Transport Regulations.

The 11th revised edition of the UN Model regulations was the first edition which included all the provisions for the transport of radioactive material as required in accordance with the 1996 edition of the IAEA Transport Regulations.

The IAEA developed the process for revision of its Transport Regulations to be harmonized with the 2-year revision process of the UN Model Regulations in order to facilitate integrated world-wide implementation by the international organizations regulating the international transport of dangerous goods by the various modes of transport. The IAEA started this new revision process at the beginning of the year 2000 which should result in the next revised edition to be published in 2003. The current status of that revision process is provided in this report.

It is intended that the 2003 edition of the UN Model Regulations incorporate the approved revisions to the current edition of the IAEA Transport Regulations. This status report includes the revisions which are approved at the present time. These revisions are identified in this report as approved minor changes and approved changes of detail. These approved changes are presented for incorporation into the UN Model Regulations. In accordance with the respective responsibilities of the UN and the IAEA the incorporation should be in the format of the UN Model Regulations without changing the requirements of the IAEA Transport Regulations. Comments are therefore requested to ensure proper format and location of these approved changes for incorporation into the UN Model Regulations. In order to facilitate this request for comments, the location in the UN Model Regulations is identified for each change while the corresponding paragraph or table in the IAEA Transport Regulations is provided in brackets.

This status report also includes changes of detail and major changes which have not yet been approved and which may be amended or deleted prior to the final approval in 2002 of all the revisions in this cycle. These changes are included for information only at this point in time.

REVISION OF THE IAEA REGULATIONS FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIAL - STATUS REPORT (15 May 2001)

1. Background

In accordance with its statutory function the International Atomic Energy Agency (IAEA) has established and maintained the “Regulations for the Safe Transport of Radioactive Material” (the Transport Regulations). The last edition of these regulations, was approved by the IAEA Board of Governors in 1996. The 1996 edition of the IAEA Transport Regulations is also known as “ST-1”.

The process for maintaining these regulations has also been reviewed and revised. Recommendations from Member States and International Organizations for an improved and much shorter revision process (two-year cycle instead of the previous 10-year cycle) were taken into account and further developed with the assistance of experts from these Member States and International Organizations. The Transport Safety Standards Advisory Committee (TRANSSAC), which is a standing body of senior regulatory officials which provides advice to the Secretariat on the overall transport safety programme, approved the resulting two-year cycle revision process and procedures at its April 1999 meeting and recommended that it be initiated at the beginning of the year 2000.

With the two-year schedule, the IAEA will be in step with the two-year regulation revision schedules of the United Nations Committee of Experts on the Transport of Dangerous Goods, the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO) and the Inland Transport Committee of the United Nations Economic Commission for Europe (UN/ECE). The requirements of the IAEA Transport Regulations have been incorporated in the regulations from these organizations. The schedule for the new revision process facilitates the harmonized worldwide implementation of the requirements of the IAEA Transport Regulations and its revisions for all modes of transport.

The new revision cycle involves four major meetings, two Revision Panel meetings and two TRANSSAC (formerly TRANSSAC) meetings. The dates for these meetings and the actions from these meetings in the first revision cycle are discussed in this report. In addition, this status report provides a summary, as of 15 May 2001, of all the changes which have been approved and all the changes which are still in the process for possible approval in this revision cycle.

2. Approval Procedures in the Two Year Revision Cycle Process

The first Revision Panel meeting in the revision cycle has to classify the proposed changes it accepts as minor change, change of detail, or major change. The classification of the changes is very important because of the different approval procedures. The changes are defined as follows:

- Minor changes are essentially limited to editorial corrections of typing errors, spelling mistakes, and translation corrections. Minor changes must not require a change in the numbering of the regulations. Minor changes result in corrected regulations.
- Changes of detail are limited to changes in the text but only in so far as to make a previously agreed meaning or intention of a provision more clear or more readily interpretable, or to correct minor technical errors. Changes of detail must not require a change in the numbering of the regulations. Changes of detail result in amended regulations.
- Major changes include all changes that do not qualify as either minor change or change of detail. Major changes result in revised regulations.

The approval procedures for these types of changes are as follows:

Minor changes which are accepted by the Revision Panel are approved. No further approvals are required and errata sheets may be issued. Approved minor changes will be incorporated in the next edition of the regulations.

Changes of detail accepted by the Revision Panel are subject to a 90 day review by the Member States. All changes of detail for which no significant objections are raised, are considered approved following the 90 day review and will be included in the next edition of the regulations. Changes of detail for which comments are received during the 90 day period will be reviewed, together with the comments, by the next Revision Panel meeting which will then prepare its recommendations concerning these changes.

Major changes accepted by the Revision Panel are first subject to review and endorsement by TRANSSC. Major changes as endorsed by TRANSSC are then subject to a 120 day review by Member States and International Organizations. The endorsed major changes together with the comments received during the 120 day review period are then submitted to the second Revision Panel meeting in the revision cycle for their final review. As a result of their review, the second Revision Panel will prepare the final draft of their recommendations for major changes. A list of all approved minor changes, approved changes of detail and recommended major changes, together with a draft revised edition of the regulations incorporating all these changes, will be prepared for submission to the second TRANSSC meeting in the cycle. The second TRANSSC meeting may approve the major changes, as presented or as amended. Following the second TRANSSC meeting the final draft of the next edition of the Transport Regulations needs to be endorsed by the Committee on Safety Standards (CSS) and to be approved by the Board of Governors before it can be published.

3. Revision Cycle Actions up to 15 May 2001

3.1 Initiation of the Two Year Revision Cycle

In accordance with the revision cycle procedures approved by TRANSSC the current revision cycle was initiated by a note verbale dated 21 March 2000 (J1.30 Circ.) which was sent to the ministries of foreign affairs of all Member States and to the relevant International Organizations. In this note verbale the Secretariat requested proposals for changes to the 1996 edition of the Transport Regulations.

212 proposals were received by the deadline of 22 May 2000. At the beginning of July 2000 all these proposals were placed on the IAEA website for Transport Safety together with standard electronic forms to provide comments on these proposals.

All Member States and International Organizations which had submitted proposals or comments on the proposals were invited to participate in the 4-8 September 2000 Revision Panel meeting. The Revision Panel meeting was attended by 79 individuals representing 21 Member States and 9 International Organizations. This meeting reviewed all proposals and all comments received by 28 August 2000.

3.2 Actions from the First Revision Panel Meeting (4-8 September 2000)

The Revision Panel approved two minor changes to the English edition of ST-1, which were identified as **00/min/01** and **00/min/02**, as well as eleven translation errors in the French and Spanish edition of ST-1, which were identified as **00/minTr/01** through **00/minTr/11**.

The Revision Panel accepted twenty-three changes of detail which were identified as **00/CoD/01** through **00/CoD/23**.

The Revision Panel accepted six major changes identified as **00/MAJ/01 through 00/MAJ/06**. In addition, one major change was accepted in principle subject to further action by the Secretariat. In addition to accepting proposed changes the Revision Panel resolved 52 guidance issues, for the advisory material to the regulations, and prioritized and classified 33 identified problems including 2 highest priority problems which required immediate attention for possible resolution in the current revision cycle. Identified problems are those proposals for which the change was not sufficiently justified and/or no revised regulatory text was provided with the proposal.

3.3 Actions following the 4-8 September 2000 Revision Panel Meeting

All accepted changes of detail were posted on the Transport Safety website at the beginning of December 2000. All Revision Panel participants and TRANSSC members were informed about this and in addition a note verbale was sent to all Member States informing them of the opportunity to provide comments until 15 March 2001.

A summary of all the changes accepted by the Revision Panel was submitted to the first TRANSSC meeting in this revision cycle. This meeting (TRANSSC VI) was held 5-9 February 2001. The Secretariat followed up on the major change which had been approved in principle by the Revision Panel and submitted this change as **00/MAJ/07** to TRANSSC VI. The Secretariat had also arranged a Consultant Services Meeting and a Technical Committee Meeting which addressed one of the two highest priority identified problems. These meetings resulted in sufficient additional information and recommended text for a major change submitted to TRANSSC VI as **00/MAJ/08**.

3.4 Actions from the 5-9 February 2001 TRANSSC Meeting

TRANSSC VI reviewed the summary of all the changes accepted by the Revision Panel and in accordance with the procedures took the following actions:

TRANSSC VI acknowledged the 2 minor changes, **00/min/01 and 00/min/02** approved by the Revision Panel.

TRANSSC VI acknowledged the 11 translation errors which had been accepted by the Revision Panel and agreed that the translation errors are not part of the process for revision (of the English edition) of the Transport Regulations. The translation errors will therefore not be further considered in this revision cycle but will be followed up by the Secretariat in accordance with the procedures for translation of the English edition of the Transport Regulations.

TRANSSC VI reviewed the 23 changes of detail accepted by the Revision Panel and reclassified 3 of these as major changes as follows:

- **00/CoD/09** reclassified as **00/MAJ/09**
- **00/CoD/12** reclassified as **00/MAJ/10**
- **00/CoD/23** reclassified as **00/MAJ/11**

TRANSSC VI endorsed the 6 major changes **00/MAJ/01 through 00/MAJ/06** which had been accepted and submitted by the revision Panel. TRANSSC VI also endorsed **00/MAJ/07** which had been accepted in principle by the Revision Panel subject to further work by the Secretariat which had been completed. In addition, TRANSSC VI endorsed, on an ad hoc basis, **00/MAJ/08**, which resulted from one of the two highest priority identified problems accepted by the Revision Panel and had been further developed through work facilitated by the Secretariat. As already mentioned TRANSSC VI reclassified 3 changes of detail as major changes **00/MAJ/09 through 00/MAJ/11**. Also, on an ad hoc basis, TRANSSC VI endorsed as

00/MAJ/12 the proposal which had been accepted by the Revision Panel as the other of the two highest priority identified problems. However, this endorsement was subject to the condition that the necessary supportive information would be made available to the Secretariat by 30 April 2001, in time for inclusion in the list of major changes subject to the 120 day review by Member States and International Organizations. The necessary additional information was made available by 30 April 2001.

3.5 Actions following the TRANSSC VI meeting

The 90 day review period for the 23 changes of detail accepted by the Revision Panel expired on 15 March 2001. The status with regard to the changes of detail is now as follows:

- 8 changes did not receive any further comment from TRANSSC or the Member States during the 90 day review. These 8 changes, **00/CoD/03, 00/CoD/07, 00/CoD/08, 00/CoD/15, 00/CoD/18, 00/CoD/19, 00/CoD/21 and 00/CoD/22** are therefore now approved for publication and inclusion in the next edition of the IAEA Transport Regulations.
- 3 changes were reclassified by TRANSSC as major changes as follows:
00/CoD/09 reclassified as **00/MAJ/09**
00/CoD/12 reclassified as **00/MAJ/10**
00/CoD/23 reclassified as **00/MAJ/11**
These changes will now be processed as major changes.
- 12 changes received comments during the 90 day review. The next Revision Panel meeting (12-16 November 2001) will consider the comments and prepare a recommendation to TRANSSC concerning each of these changes of detail. This involves the following changes of detail: **00/CoD/01, 00/CoD/02, 00/CoD/04, 00/CoD/05, 00/CoD/06, 00/CoD/10, 00/CoD/11, 00/CoD/13, 00/CoD/14, 00/CoD/16, 00/CoD/17 and 00/CoD/20.**

4. Major Follow up Meetings

The final Revision Panel meeting of this revision cycle will be held 12-16 November 2001. This Revision Panel meeting will prepare the final draft of the revisions, including all accepted minor changes, changes of detail and major changes, for submission to the 18-22 March 2002 TRANSSC meeting. At that meeting TRANSSC may approve the remaining proposed changes and the final draft of the next edition of the Transport Regulations. Following TRANSSC approval there is still the need for CSS endorsement and approval by the IAEA Board of Governors before a revised edition can be published (in 2003).

5. Summary of all Changes Approved or still under Consideration as of 15 May 2001

The following summaries include all the changes (minor changes, changes of detail and major changes) which have been approved or are still under consideration in the current revision cycle. The change from ST-1 is marked in bolded text, the paragraph number or location in ST-1 is identified with each change.

5.1 Summary of Approved Minor Changes

00/min/01:

NOTE. This change to the IAEA Transport Regulations requires **no change to** the UN Model Regulations where **3.1.2.2 note (a)** already provides this instruction on proper shipping name for all dangerous goods in the Dangerous Goods List.

Change IAEA TABLE VIII, note “a” to the following:

The “PROPER SHIPPING NAME” is found in the column “PROPER SHIPPING NAME and description” and is restricted to that part shown in CAPITAL LETTERS. In the case of UN 2909, UN 2911, **UN 2913, and UN3326** where alternative PROPER SHIPPING NAMES are separated by the word “or”, only the relevant “PROPER SHIPPING NAME” shall be used.

00/min/02:

Change the header prior to **2.7.3.4** (IAEA para 703) to the following:

LEACHING TEST FOR LSA-III MATERIAL AND LOW DISPERSIBLE RADIOACTIVE MATERIAL

5.2 Summary of Approved Changes of Detail

00/CoD/03:

2.7.8.3 (IAEA para. 532). The maximum *radiation level* at any point on any external surface of a *package or overpack* under *exclusive use* shall not exceed 10 mSv/h.

NOTE. The **following changes under 00/CoD/03 do not apply to the UN Model Regulations** because they do not include the Schedules from the IAEA Transport Regulations.

Schedules: COMMON PROVISIONS FOR SCHEDULES 5-14

B.3.(a)(iii) 10 mSv on any external surface of a *package or overpack* transported under *exclusive use*.

00/CoD/07:

NOTE. The following change to the IAEA Transport Regulations does not require any change to the UN Model Regulations because the reference to the Dangerous Goods List (which incorporates IAEA Table VIII) is **already included in 5.2.1.1**.

IAEA para. 535. For each package, otherletters “UN”, and the proper shipping name (**see Table VIII**) shall be legibly shall apply.

00/CoD/08:

Title of **Table 2.7.6.1.1** (IAEA TABLE VI): **MULTIPLICATION FACTORS FOR TANKS, FREIGHT CONTAINERS, AND UNPACKAGED LSA-I AND SCO-I**

00/CoD/15:

Instead of always referring to, for example, **Industrial Packages Type 2 and 3 (Type IP 2 and Type IP 3)**, **just refer to Type IP 2 and Type IP 3**. The **complete wording** could be used **only in the definition** of these package types. This would make the regulations more consistent as they would refer to Type A, Type B, Type C, and Type IP packages.

The **affected paragraphs/locations in the UN Model Regulations** are the following:

2.7.2, 4.1.9.2.1, 5.2.1.5.4, 6.4.5.1/6.4.5.3, 6.4.5.4.1/6.4.5.4.5, 6.4.24.1, 6.4.23.9 and 6.4.23.10
(Respectively IAEA Paragraphs: 230, 521, 537, 621/628 ,815, 828 and 829)

Locations: **Title prior to 2.7.7.1.3, 6.4.5 and 6.4.5.4** (IAEA paragraphs 411 and 621/624), **NOTE no change required in title prior to 4.1.9.2.1** (IAEA para. 521) **because wording in the UN Model Regulations already appropriate**.

00/CoD/18:

6.4.11.1(b)(i) (IAEA para. 671(b)(i)): of 6.4.7.2 (IAEA para 634) for *packages containing fissile material*;

00/CoD/19:

NOTE: This Change of Detail is not a change to the English edition of ST-1. It concerns a translation error in the title before para. 624 of the French version of ST-1. The correction to the translation of this title should take into account the approval of **00/CoD/15**.

NOTE. Accordingly, **translation of 6.4.5.4** (IAEA title before para 624) should be consistent with the French translation of ST-1 and take into account the approval of 00/CoD/15.

00/CoD/21:

6.4.17.2(b) (IAEA para. 727(b)) The word “edges” shall be replaced with “**edge**”

6.4.20.2(a) (IAEA para. 735(a)) The specimen, representingdiameter at the **top with its edge rounded off to a radius of not more than 6 mm**. The target...para.717.

00/CoD/22:

6.4.11.10 (IAEA para. 680). For packages to be transported by air:

- a) the package shall be subcritical under conditions consistent with the **Type C package tests specified** in 6.4.20.1 (IAEA para. 734) assuming reflection by at least 20 cm of water but no water inleakage, and
- b) **in the assessment of 6.4.11.9** (IAEA para. 679) allowance shall not be made for the special features of 6.4.11.7 (IAEA para. 677) unless, following the **Type C package tests** specified in 6.4.20.1 (IAEA para. 734) and, subsequently, **the water inleakage test of 6.4.19.3** (IAEA para. 733), leakage of water into or out of void spaces is prevented.

5.3 Summary of Changes of Detail Reclassified as Major Change

The following changes of detail were reclassified by TRANSSC VI as a major change.

- **00/CoD/09** reclassified as **00/MAJ/09**
- **00/CoD/12** reclassified as **00/MAJ/10**
- **00/CoD/23** reclassified as **00/MAJ/11**

These changes will now be processed as major changes. Therefore they are included, under the above indicated numbers, in the list of major changes to be placed on the web site for the 120 day comment by Member States and International Organizations. Comments already received concerning these changes, while posted on the web site as change of detail, will be taken into account. For further details on these changes see the corresponding major change in the summary of endorsed major changes in this report.

5.4 Summary of Changes of Detail which Received Comments (to be considered by the 12-16 November 2001 Revision Panel together with comments received).

00/CoD/01:

NOTE. This change to the Schedules in the IAEA Transport Regulations **does not require any change to the UN Model Regulations** because they do not include the Schedules.

This change of detail, regarding the correction of the placarding provisions outlined in Part 9 of Schedules 5, 6, 7, and 9 in the case of uranium hexafluoride involves the following changes to Part 9 of Schedules 5, 6, 7 and 9 in ST-1:

Schedule 5, Part 9(b) bis For unpackaged LSA-1.....shown in the Fig. 7. **However, if the packages contain non-fissile or fissile-excepted uranium hexafluoride, "2978" shall be displayed. For the placards shown in Fig. 6, the numbers shall be preceded by the letters "UN".**

Schedule 6, Part 9(b) bis. Where an exclusive use "3324" shall be displayed on the placards. **However, if the packages contain non-fissile or fissile-excepted uranium hexafluoride, "2978" shall be displayed. If the packages contain uranium hexafluoride that is fissile material, "2977" shall be displayed.** For the placards shown in Fig. 6, the numbers shall be preceded by the letters "UN".

Schedule 7, Part 9(b) bis. Where an exclusive use "3325" shall be displayed on the placards. **However, if the packages contain non-fissile or fissile-excepted uranium hexafluoride, "2978" shall be displayed. If the packages contain uranium hexafluoride that is fissile material, "2977" shall be displayed.** For the placards shown in Fig. 6, the numbers shall be preceded by the letters "UN".

Schedule 9, Part 9(c) bis. Where an exclusive use "3327" shall be displayed on the placards. **However, if the Type A packages contain non-fissile or fissile-excepted uranium hexafluoride, "2978" shall be displayed. If the Type A packages contain uranium hexafluoride that is fissile material, "2977" shall be displayed.** For the placards shown in Fig. 6, the numbers shall be preceded by the letters "UN".

00/CoD/02:

This change of detail, concerning deletion of the words "special form" in the second line of 5.1.5.1.2 (IAEA para. 502 (f)) would result in the following:

5.1.5.1.2 (IAEA para. 502 (f)) For each special form radioactive material, it shall be ensured that all the requirements specified in the approval certificate and the relevant provisions of these Regulations have been satisfied.

00/CoD/04:

This change of detail, excluding objects with a very low level of contamination from application of the regulations, would result in the following text for 2.7.1.1 (IAEA para. 236):

2.7.1.1 (IAEA para. 236). Radioactive material shall mean any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in 2.7.7.2.1 - 2.7.7.2.6 (IAEA paras 401-406). **Non-radioactive solid objects with levels of surface contamination lower than those mentioned in 2.7.2 (IAEA para. 214) are excluded from this definition.**

00/CoD/05:

NOTE. This change to the French edition, **if approved for the IAEA Transport Regulations**, is a translation issue for the UN Model Regulations.

This change of detail, regarding the use of the English terms and acronyms throughout the French version of ST-1 for the following:

Use the English terms and acronyms “**radioactive**”, “**IP**”, “**LSA**”, and “**SCO**” throughout the French version of ST-1.

00/CoD/06:

This change of detail, concerning radiation levels for conveyances under exclusive use would result in the following text for 7.1.6.3.3(c) (IAEA para. 566 (c)):

7.1.6.3.3(c) (IAEA para. 566 (c)) The radiation level under routine conditions of transport shall not exceed 2 mSv/h at any point on, and 0.1 mSv/h at 2 m from, the external surface of the conveyance. **For a consignment transported under exclusive use, the radiation level limits around the vehicle are set forth in 7.2.3.1.2(b) and (c) (IAEA para. 572(b) and (c)).**

00/CoD/10:

This change of detail, concerning the inclusion of tanks and some editorial simplification, would result in the following text for 2.7.6.1.1 (IAEA para. 526):

2.7.6.1.1 (IAEA para. 526). The *transport index (TI)* for a *package, overpack, tank, freight container*, or for unpackaged *LSA-I* or *SCO-I* shall be the number derived in accordance with the following procedure:

- (a) **Determine the maximum radiation level in units of millisieverts per hour (mSv/h) at a distance of 1 m from the external surface. The value determined shall be multiplied by 100 and the resulting number is the transport index. For uranium.... (no change to remaining text)**
- (b) **The value determine in step (a) above shall be multiplied by the appropriate factor from Table 2.7.6.1.1 (IAEA Table VI).**
- (c) No change to previous text

00/CoD/11:

This change of detail, concerning the calculation of criticality safety index for overpacks, freight containers or conveyances, would result in the following change to 2.7.6.2.2 (IAEA para. 529) (TRANSSC selected the following preferred text of the alternative texts accepted by the Revision Panel):

2.7.6.2.2 (IAEA para. 529). The criticality safety index for each **overpack, freight container, consignment, or conveyance** shall be determined as the sum of the CSIs **of all the packages contained**

00/CoD/13:

This change of detail, concerning the proper segregation distance for packages containing fissile material would result in the following modified text for 7.1.6.4.1 (IAEA para. 568):

7.1.6.4.1 (IAEA para. 568). The number of *packages, overpacks, and freight containers* containing *fissile material* stored in transit in any one storage area shall be so limited that the total sum of the *criticality safety indexes* in any **such group** does not exceed 50. **The groups** shall be stored so as to maintain a spacing of at least 6 m from other **such groups** .

00/CoD/14:

This change of detail, concerning the proper contamination level for conveyances and agreed to the following change to ST-1:

4.1.9.1.4 (IAEA para. 509). Except as provided in 7.1.6.5.5 (IAEA para. 514), **the non-fixed** contamination on the external and internal surfaces of overpacks, freight containers, tanks, and intermediate bulk containers, **and conveyances** shall not exceed the **levels** specified in 4.1.9.1.2 (IAEA para. 508).

00/CoD/16:

This change of detail, concerning wording in 6.4.11.5 (IAEA para. 675), would result in the following changed text:

6.4.11.5 (IAEA para. 675). The **package**, after being subjected to the tests specified in paras 719-724, must prevent the entry of a 10cm cube.

00/CoD/17:

This change of detail, concerning uranium hexafluoride issues, would involve the following changes to ST-1:

6.4.6.1 (IAEA para. 629) **Packages designed to contain uranium hexafluoride shall meet the requirements prescribed elsewhere in these Regulations which pertain to the radioactive and fissile properties of the material.** Except as allowed in 6.4.6.4 (IAEA para. 632), uranium hexafluoride **in quantities of 0.1 kg or more** shall **also** be packaged and transported in accordance with the provisions of the International Organization for Standardization document ISO 7195: Packaging of Uranium Hexafluoride (UF₆) for Transport [10], and the requirements of 6.4.6.2 and 6.4.6.3 (IAEA paras 630-631).

6.4.6.2 (IAEA para.630). Each package designed to contain 0.1 kg or more of uranium hexafluoride shall be designed so that it would meet the following requirements:

- (a) withstand without leakage and without unacceptable stress, as specified in the International Organization for Standardization document ISO 7195 [10], the structural test as specified in 6.4.21 (IAEA para. 718);
- (b) withstand without loss or dispersal of the uranium hexafluoride the **free drop** test specified in 6.4.15.4 (IAEA para. 722); and
- (c) withstand without rupture of the containment system the **thermal** test specified in 6.4.17.3 (IAEA para. 728).

6.4.6.3 (IAEA para. 631) (**No Change**) Packages designed to contain 0.1 kg or more of uranium hexafluoride shall not be provided with pressure relief devices.

6.4.6.4 (IAEA para. 632). Subject to the approval of the competent authority, packages designed to contain 0.1 kg or more of uranium hexafluoride may be transported if :

- (a) the packages are designed to international or national standards other than ISO 7195 provided an equivalent level of safety is maintained;
- (b) the packages are designed to withstand without leakage and without unacceptable stress a test

pressure of less than ~~2.8~~ **2.76** MPa as specified in 6.4.21 (IAEA para. 718); or

- (c) for packages designed to contain 9000 kg or more of uranium hexafluoride, the packages do not meet the requirement of 6.4.6.2(c) (IAEA para 630(c)).

In all other respects the requirements specified in 6.4.6.1-6.4.6.2 (IAEA paras 629-631) shall be satisfied.

00/CoD/20:

This change of detail, concerning impact test for Type C packages, would result in the following changes to ST-1:

6.4.14 (IAEA para. 717). Delete reference to 6.4.20.4 (IAEA para. 737)

6.4.20.4 (IAEA para. 737). Impact test: The specimen shall be subject to an impact on a target at a velocity of not less than 90 m/s, at such an orientation as to suffer maximum damage. The target shall be as defined in 6.4.14 (IAEA para. 717), **except that the target surface may be at any orientation as long as the surface is normal to the specimen path.**

5.5 Summary of Major Changes Endorsed by TRANSSC VI

00/MAJ/01:

Add the following to **1.1.2** (IAEA Section III of ST-1):

1.1.2.6 (IAEA heading prior to **new** para. 312 bis) **NON-COMPLIANCE**

1.1.2.6.1 (IAEA **new** para. 312 bis). **In the event of a non-compliance of any limit applicable to radiation level or contamination, as specified in 4.1.9.1.2, 2.7.8.1.- 2.7.8.3 and 7.1.6.3.3 (respectively IAEA paras 508, 530-532 and 566), the consignor shall be informed by**

- (a) **the carrier if the non-compliance is identified during transport; or**
- (b) **the consignee if the non-compliance is identified at receipt.**

1.1.2.6.2 (IAEA **new** para. 312 bis+1). **The carrier, consignor or consignee, as appropriate, shall:**

- (a) **take immediate steps to mitigate the consequences of the non-compliance;**
- (b) **investigate the non-compliance and its causes, circumstances and consequences;**
- (c) **take appropriate action to remedy the causes and circumstances that led to the non-compliance and to prevent a recurrence of similar circumstances that led to the non-compliance; and**
- (d) **communicate to the relevant competent authority(ies) on the causes of the non-compliance and on the corrective or preventive actions taken or to be taken.**

1.1.2.6.3 (IAEA **new** para. 312 bis+2). **The communication of a non-compliance to the consignor and relevant competent authority(ies), respectively, shall be made as soon as practicable and it shall be immediate whenever an emergency exposure situation has developed or is developing.**

00/MAJ/02:

NOTE. This change to the IAEA Transport Regulations is identical to **existing 1.3.1, 1.3.2 and 1.3.3** in the UN Model Regulations.

Add the following to Section III of ST-1:

TRAINING

3xx. **Persons engaged in the transport of radioactive material shall receive training in the contents of these safety requirements commensurate with their responsibilities.**

3xx+1. **Individuals such as those who classify radioactive material; pack radioactive material; mark and label radioactive material; prepare transport documents for radioactive material; offer or accept radioactive material for transport; carry or handle radioactive material in transport; mark or placard or load or unload packages of radioactive material into or from transport vehicles, bulk packagings or freight containers; or are otherwise directly involved in the transport of radioactive material as determined by the competent authority; shall receive the following training:**

- (a) **General awareness/familiarization training:**
 - i. Each person shall receive training designed to provide familiarity with the general provisions of these safety requirements;
 - ii. Such training shall include a description of the categories of radioactive material; labeling, marking, placarding and packaging and separation requirements; a description of the purpose and content of the radioactive material transport document; and a description of available emergency response documents;
- (b) **Function-specific training:** Each person shall receive detailed training concerning specific radioactive material transport requirements which are applicable to the function that person performs;
- (c) **Safety training:** Commensurate with the risk of exposure in the event of a release and the functions performed, each person shall receive training on:
 - i. Methods and procedures for accident avoidance, such as proper use of package-handling equipment and appropriate methods of stowage of radioactive material;
 - ii. Available emergency response information and how to use it;
 - iii. General dangers presented by the various categories of radioactive material and how to prevent exposure to those hazards, including if appropriate the use of personal protective clothing and equipment; and
 - iv. Immediate procedures to be followed in the event of an unintentional release of radioactive material, including any emergency response procedures for which the person is responsible and personal protection procedures to be followed.

3xx+2. The training required by 3xx+1 shall be provided or verified upon employment in a position involving radioactive material transport and shall be periodically supplemented with retraining as deemed appropriate by the competent authority.

00/MAJ/03:

Change 2.7.9.3(b) (IAEA para. 517(b)) to the following:

2.7.9.3(b) (IAEA para. 517(b)) Each instrument or article (except a consumer product which has received regulatory approval according to 2.7.1.2(d) (IAEA para 107(d)) and with an activity that does not exceed the activity limit for an exempt consignment in Table 2.7.7.2.1 (IAEA Table I) (column 5) bears the marking “RADIOACTIVE”; and

00/MAJ/04:

Change the A_1 value for Cf-252 in Table 2.7.7.2.1 (IAEA Table I) to the following:

1×10^{-1} TBq

00/MAJ/05:

Change Table 6.4.8.5 (IAEA TABLE XI) to the following:

TABLE 6.4.8.5 (IAEA TABLE XI) INSOLATION DATA

Form and location of surface	Insolation for 12 hours per day (W/m ²)
Flat surfaces transported horizontally :	
- downward facing surfaces	none
- upward facing surfaces	800
Surfaces transported vertically and other downward facing surfaces	200 ^a
Other surfaces	400 ^a

^a Alternatively, a sine function may be used, with an absorption coefficient adopted and the effects of possible reflection from neighbouring objects neglected.

00/MAJ/06:

Change 6.4.7.16(a) (IAEA para. 648(a)) to the following:

6.4.7.16(a) (IAEA para 648(a)) Be adequate to meet the conditions specified in 6.4.7.14(a) (IAEA para. 646(a)) above if the package is subjected to the tests specified in 6.4.16 (IAEA para. 725); and

00/MAJ/07:

6.4.3.3 (IAEA para. 619). *Packages containing radioactive material, to be transported by air, shall be capable of withstanding without leakage an internal pressure which produces a pressure differential of not less than maximum normal operating pressure + 95 kPa.*

00/MAJ/08:

This Major Change consists of the following 11 related changes to ST-1:

1. Change 1.1.2.1.1 (IAEA para. 101) as follows:

1.1.2.1.1 (IAEA para. 101) [add to end of paragraph] These regulations are effective for transport operations commencing after 31st December 2008.

2. Change **header above 6.4.24.1** (IAEA para. 815) to:

Packages not requiring competent authority approval of design

3. Change **6.4.24.1** (IAEA para. 815) as follows:

6.4.24.1.1 (IAEA para. 815). Excepted packages, Industrial packages Types IP-1, IP-2 and IP-3 and Type A packages which do not require approval of design by the competent authority and which meet the requirements of the **regulations specified in column 1 of table 6.4.24.1** (new IAEA table XIV) **may continue to be used or manufactured until the corresponding date specified in column 3 of table 6.4.24.1** (new IAEA table XIV). **Use or manufacture shall be** subject to the mandatory programme of quality assurance in accordance with the requirements of 1.1.2.3.1 (IAEA para. 310) and the activity limits and material restrictions of section IV. **Packages prepared for transport not later than the date specified in column 3 of table 6.4.24.1** (new IAEA table XIV) **for the corresponding Edition of the regulations specified in column 1, may continue in transport.**

6.4.24.1.2.(new IAEA para. 815bis) **Excepted packagings, Industrial packagings Types IP-1, IP-2 and IP-3 and Type A packagings which do not require approval of design by the competent authority may be designed or modified until the date specified in column 2 of table 6.4.24.1** (new IAEA table XIV) **in accordance with the requirements of the corresponding edition of the regulations specified in column 1 of table 6.4.24.1** (new IAEA table XIV).

Table 6.4.24.1 (new IAEA table XIV): **NON-COMPETENT APPROVED**

	Safety Significant Design Changes	Manufacture & Use
1985	Dec. 31, 2000	Dec. 31, 2003
1996	Dec. 31, 2011	Dec. 31, 2014
2003	Dec. 31, 2018	Dec. 31, 2021

4. Change **header above 6.4.24.2** (IAEA para 816) to:

Packages approved under a previous Edition of these Regulations

5. Change 6.4.24.2 (IAEA para. 816) as follows:

6.4.24.2.1 (IAEA para. 816). Packagings manufactured to a package design approved by the competent authority **as meeting the requirements of the regulations specified in column 1 of table 6.4.24.2** (new IAEA table XV) may continue to be used **until the date specified in column 5 of table 6.4.24.2** (new IAEA table XV) **corresponding with the edition of the regulations specified in column 1 of table 6.4.24.2** (new IAEA table XV) **and package category specified in column 2 of table 6.4.24.2** (new IAEA table XV). **Use shall be subject to** the mandatory programme of quality assurance in accordance with the requirements of 1.1.2.3.1 (IAEA para. 310), the activity limits and material restrictions of 2.7.7 (IAEA section IV) and for packages containing fissile material and transported by air, the requirement of 6.4.11.10 (IAEA para 680). **After this date use may continue until the corresponding date specified in column 6 of table 6.4.24.2** (new IAEA table XV) **subject, additionally, to multilateral approval of package design. Packages prepared for transport after the date in column 5 of table 6.4.24.2** (new IAEA table XV) **for the selected Edition of the regulation specified in column 1, shall meet a subsequent Edition of the Regulation in full.**

6.4.24.2.2 (new IAEA para 816bis). **All packagings which require competent authority approval may be manufactured until the date specified in column 4 of table 6.4.24.2** (new IAEA table XV) **corresponding to the edition of the regulations in column 1 of table 6.4.24.2** (new IAEA table XV) **to which they are approved. After this date no new manufacture shall commence. These packagings may be manufactured subject to the mandatory programme of quality assurance in accordance with the requirements of 1.1.2.3.1** (IAEA para. 310), **the activity limits and material restrictions of 2.7.7** (IAEA section IV) **and for packages containing fissile material and transported by air, the requirement of 6.4.11.10** (IAEA para 680).

6.4.24.2.3 (new IAEA para 816bis+1). **All packagings which require competent authority approval may be designed or changes in the design or in the nature or quantity of the authorized radioactive contents which, as determined by the competent authority, would significantly affect safety, may be made until the date specified in column 3 of table 6.4.24.2** (new IAEA table XV), **in accordance with the requirements of the corresponding edition of the regulations specified in column 1 of table 6.4.24.2** (new IAEA table XV). **Design or modification shall be subject to the mandatory programme of quality assurance in accordance with the requirements of 1.1.2.3.1** (IAEA para. 310), **the activity limits and material restrictions of 2.7.7** (IAEA section IV).

Table 6.4.24.2 (new IAEA table XV)

Year	Type	Design	Build	Unilateral approval	End of use
1973	All Packages	Dec. 31, 1995	Dec. 31, 1995	Dec. 31, 1993	Dec. 31, 2006
1985	All Packages	Dec. 31, 2001	Dec. 31, 2006	Dec. 31, 2003	Dec. 31, 2018
	Special Form	Dec. 31, 2001	Dec. 31, 2003	-	Dec. 31, 2018
1996	All Packages	Dec. 31, 2012	Dec. 31, 2017	Dec. 31, 2014	Dec. 31, 2029
	Special Form	Dec. 31, 2012	Dec. 31, 2017	-	Dec. 31, 2029
	Low Dispersible	Dec. 31, 2012	Dec. 31, 2017	-	Dec. 31, 2029
2003	All Packages	Dec. 31, 2019	Dec. 31, 2024	Dec. 31, 2021	Dec. 31, 2036
	Special Form	Dec. 31, 2019	Dec. 31, 2024	-	Dec. 31, 2036
	Low Dispersible	Dec. 31, 2019	Dec. 31, 2024	-	Dec. 31, 2036

6. Delete 6.4.24.3 (IAEA para. 817)

7. Change header above 6.4.24.4 (IAEA para. 818) to:

Special form radioactive material approved under a previous Edition of these Regulations

8. Change 6.4.24.4 (IAEA para. 818) as follows:

6.4.24.4.1 (IAEA para. 818). Special form radioactive material manufactured to a design which had received unilateral approval by the competent authority under **the Edition of the Regulations specified in column 1 of table 6.4.24.2** (new IAEA table XV) may continue to be used when in compliance with the mandatory programme of quality assurance in accordance with the applicable requirements of 1.1.2.3.1 (IAEA para. 310) **until the corresponding date specified in column 6 of Table 6.4.24.2** (new IAEA table XV).

6.4.24.4.2 (new IAEA para. 818bis). **Special form radioactive material may be designed or modified until the date specified in column 3 of table 6.4.24.2** (new IAEA table XV) **in accordance with the requirements of the corresponding edition of the regulations specified in column 1 of table 6.4.24.2** (new IAEA table XV).

6.4.24.4.3 (new IAEA para 818bis+1). **All special form radioactive material may be manufactured until the date specified in column 4 of table 6.4.24.2** (new IAEA table XV) **corresponding to the edition of the edition of the regulations in column 1 of table 6.4.24.2** (new IAEA table XV) **to which it is approved. After this date no new manufacture shall commence. These special form radioactive material may be manufactured subject to the mandatory programme of quality assurance in accordance with the requirements of 1.1.2.3.1** (IAEA para. 310).

Low dispersible radioactive material approved under a previous Edition of these Regulations

6.4.24.4.4 (new IAEA para. 818bis+2). **Low dispersible radioactive material manufactured to a design which had received multilateral approval by the competent authority under the Edition of the Regulations specified in column 1 of table 6.4.24.2 (new IAEA table XV) may continue to be used when in compliance with the mandatory programme of quality assurance in accordance with the applicable requirements of 1.1.2.3.1 (IAEA para. 310).**

6.4.24.4.5 (new IAEA para. 818bis+3). **Low dispersible radioactive material may be designed or modified until the date specified in column 3 of table 6.4.24.2 (new IAEA table XV) in accordance with the requirements of the corresponding edition of the regulations specified in column 1 of table 6.4.24.2 (new IAEA table XV).**

6.4.24.4.6 (new IAEA para. 818bis+4). **All low dispersible radioactive material may be manufactured until the date specified in column 4 of table 6.4.24.2 (new IAEA table XV) corresponding to the edition of the edition of the regulations in column 1 of table 6.4.24.2 (new IAEA table XV) to which it is approved. After this date no new manufacture shall commence. This low dispersible radioactive material may be manufactured subject to the mandatory programme of quality assurance in accordance with the requirements of 1.1.2.3.1 (IAEA para. 310).**

9. **Amend IAEA para. 819 as follows: (NOTE. No change required in corresponding UN 6.4.23.15)**

reference to 816-817 becomes reference to 816bis+1

10. Change 6.4.23.9(d) (IAEA para 828(d)) as follows:

6.4.23.9(d) (IAEA para. 828(d)) For package design and special form radioactive material approval certificates, other than those issued under the provisions of 6.4.24.2 -6.4.24.4 (IAEA paras 816-818, and for low dispersible radioactive material approval certificates, the symbols “-03” shall be added to the type code.

11. **Amend 6.4.23.10** (IAEA para. 829) as follows:

REPLACE ALL OCCURRENCES OF “96” BY “03”.

00/MAJ/09:

Change 7.1.6.5.5 (IAEA para. 514) to the following:

7.1.6.5.5 (IAEA para. 514). A freight container, tank, intermediate bulk container or conveyance dedicated to the transport of **unpacked low specific activity material (LSA-I) or surface contaminated objects (SCO-1)** under exclusive use shall be excepted from the requirements of 4.1.9.1.4 (IAEA para. 509) and 7.1.6.5.4 (IAEA para.513) solely with regard to its internal surfaces and only for as long as it remains under that specific exclusive use.

00/MAJ/10:

Change 5.4.1.1.7.1(k) (IAEA para. 549(k)) to the following:

5.4.1.1.7.1(k) (IAEA para.549(k)) For consignments of **more than one package or conveyance, the information contained in 5.4.1.1.7.1(a) to (j)** (IAEA para 549(a) to (j)) **shall be given for each package. For packages in an overpack, freight container, or conveyance,** a detailed statement of the contents of each package within the overpack, freight container, **or conveyance** and, where appropriate, of each overpack, freight container, **or conveyance shall be included.** If packages are to be removed from the overpack, freight container, **or conveyance** at a point of intermediate unloading, appropriate transport documents shall be made available.

00/MAJ/11:

Change the last sentence of 6.4.11.2(a) (IAEA para. 672(a)) to the following:

6.4.11.2(a) (IAEA para.672(a)) (last sentence) Neither beryllium nor deuterium shall be present in quantities exceeding **1% of the consignment mass limits provided in Table 6.4.11.2 (IAEA Table XII).**

00/MAJ/12:

Change 2.7.1.2(e) (IAEA para. 107(e)) to the following:

2.7.1.2(e) (IAEA para. 107(e)) natural material and ores containing naturally-occurring radionuclides which **are in their natural state, or which are processed, and** are not intended to be **further** processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in 2.7.7.2 (IAEA paras 401-406).
