Chair:
Mr Fernando Zamora - Spain
Mr Jarlath Duffy – Ireland

Secretary:
Mr Daniel Cortez – Universal Postal Union

Group members:
Mr Christian Elechosa - Argentina
Mr Friedrich Kirchnawy - Austria
Mr Guy Lourtie - Belgium
Ms Adelia Sahyun - Brazil
Mr Marc Andre’ Charette - Canada
Mr Greg Fulford - Canada
Mr David Lamarche - Canada
Mr Jiri Dozbaba - Czech Republic
Mr Santtu Hellsten - Finland
Mr Cedric Dejean - France
Mr Peter Girkens - Germany
Mr Frank Nitsche - Germany
Mr Ahmad Eshraghi - Islamic Republic of Iran
Mr Sandro Trivelloni - Italy
Ms Akiko Konnai - Japan
Mr Mathieu Ter Morshuizen - Netherlands
Mr Sverre Hornkjoel - Norway
Ms Katarzyna Doner - Poland
Mr Vladimir N. Ershov - Russian Federation
Mr Michael Lars Wallin - Sweden
Mr Jan van Aarle - Switzerland
Mr Michael Conroy - United States of America
Mr Gerhard Wortmann - International Source Suppliers and Producers Association (ISSPA)
Mr Olivier Kervella - United Nations/Economic Commission for Europe
Mr Ben Dekker - World Nuclear Transport Institute
1. **Background**

TRANSSC 27 - Working Group 1 identified a number of issues that warranted further review, noting that some of the issues if further developed could in a future review cycle warrant consideration as revisions to SSR-6. The Secretariat agreed to study some of the issues at working group meetings during TRANSSC 28.

2. **Introduction**

The Chairs provided an overview of the Terms of Reference (Annex I) and of the proposed working methods for the meeting (Annex II). Reference was made to the document prepared by F. Zamora on suggestions on how to deal with the issues raised.

A summary by each MS or Observers was then made on each of the specific issues raised. This was then followed by discussions.

3. **Conclusions**

Following the discussions on each of the comments the WG resolutions are presented in Annex III.
Annex I
Terms of Reference for Working Group #2/#3/#4

A. Background:

TRANSSC 27 - Working Group 1 identified a number of issues that warranted further review, noting that some of the issues if further developed could in a future review cycle warrant consideration as revisions to SSR-6. The Secretariat committed to help coordinate Member State evaluation and study of some of the issues at future consultancies and working group meetings, and offered to assist in coordinating the participation of Member States interested in contributing to the in correspondence/working groups led by TRANSSC members.

The proposals selected by TRANSSC 27 for further analysis were grouped according to the main topics to which they were related. Each working group will assess the issues identified along with its topical area to propose how to address, combine or redefine them.

The topical areas are:

WG 2: Radiation Protection
WG 3: Classification, Marking/Labelling, Placarding and Documentation
WG 4: Test and Design Requirements

B. Work to be done

Consider the proposals for change identified in the list of working groups.

WG 2 (Ctrl+Click to follow link)
WG 3 (Ctrl+Click to follow link)
WG 4 (Ctrl+Click to follow link)

Propose acceptance/rejection or propose alternate paths forward to modify/reformulate/combine/evaluate the comments in view of the next Review Cycle for Transport Regulations, to begin in 2015.

C. Expected Output

A working group report will be drafted and will include a record of the basis for the final recommendations proposed.

The recommendations on the path forward of the Working Group shall be presented to TRANSSC 28 Plenary for information.
**Annex II**

**Suggestions for the WG-3 on classification, marking/labelling, placarding and documentation**

The WG-3 will assess the issues identified in the topical area on ‘classification, signalization and documentation’. The issues were presented during the last review cycle by the next comments of Member States and International Organizations:

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<tbody>
<tr>
<td>6</td>
<td>E/1.00/1</td>
</tr>
<tr>
<td>18</td>
<td>D/1.00/8</td>
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<tr>
<td>42</td>
<td>F/1.00/19</td>
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<tr>
<td>46</td>
<td>ICAO/1.00/1</td>
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<td>52</td>
<td>WNTI/1.00/5</td>
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<tr>
<td>53</td>
<td>WNTI/1.00/6</td>
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<tr>
<td>54</td>
<td>WNTI/1.00/7</td>
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Some of these comments identify the same specific issues; for example:

- How to classify transports of contents less restrictive than those approved for a specific package (i.e. use a lower category of package type): F/1.00/19, ICAO/1.00/1 and WNTI/1.00/7.
- How to classify transports of packages with mixed packing (i.e. when two or more UN numbers may apply): F/1.00/19, WNTI/1.00/5 and WNTI/1.00/5.

Additionally, while some comments propose specific changes for the SSR-6 and/or TSG.1.1 another one only identify the problem without a specific proposal of change.

Then, in order to work more efficiently in the WG-3, it is suggested to carry out the assessment ‘issue by issue’ instead of ‘comment by comment’. In this way, when a solution is found for a particular issue, that solution will give answer to several comments.

On the other hand, all the specific issues identified by the comments are connected with or included in one of the next general issues:

1. Consignment classification (UN number selection)
2. Marking, placarding and documentation,

However, the marking, placarding and documentation to be considered in a specific shipment are a consequence of the consignment classification previously applied; so, it is suggested that the first issues that should be assessed and solved are those related to the consignment classification procedure.

In line with the previous suggestions, and independently of them, the next table is presented with the aim to facilitate the work to be carried out by the WG-3. The table arranges the specific issues raised by the comments in two general issues, which
have been mentioned before, and identify the paragraphs of the SSR-6 and TSG.1.1 affected by specific proposals.
<table>
<thead>
<tr>
<th>General issue</th>
<th>Specific issue</th>
<th>MS/IO Comment</th>
<th>Paragraphs of SSR-6 affected by specific proposals</th>
<th>Paragraphs of TSG.1.1 (Rev.1) affected by specific proposals</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Consignment classification (UN number selection)</td>
<td>Clarification of the classification procedure</td>
<td>E/1.00/1</td>
<td>530</td>
<td>530.1 / 532.1</td>
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<td></td>
<td>Transport of an approval package authorized for several contents with different UN number</td>
<td>E/1.00/1</td>
<td>838</td>
<td>New 838.2</td>
<td>This proposal may be unnecessary if the general procedure used for the classification of a consignment is enough clear in Regulations</td>
</tr>
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<td></td>
<td>Transport of contents less restrictive than those approved for a specific package (Use a lower category of package type)</td>
<td>F/1.00/19</td>
<td>No specific proposal</td>
<td>No specific proposal</td>
<td>WNTI/1.00/7 presents specific solutions. See below.</td>
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<tr>
<td></td>
<td>WNTI/1.00/7</td>
<td>New subsection: ‘PACKAGE HIERARCHY’ 5xx</td>
<td>New 5xx.1 (referring to ‘PACKAGE HIERARCHY’) New 5xx.2 (referring to ‘PACKAGE HIERARCHY’)</td>
<td>Introduction of a hierarchy of package types, allowing the use of a more appropriate UN number without having to change the mark corresponding to the package type.</td>
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<td></td>
<td>ICAO/1.00/1</td>
<td>No specific proposal</td>
<td>No specific proposal</td>
<td>Identified problem focused on transport of Empty B(U) or B(M) packages. A particular reference is made to Empty B packages with depleted Uranium in the packaging shielding material. WNTI/1.00/7 presents specific solutions. See above.</td>
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<td>MS/IO Comment</td>
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<td>Consignment classification in case of mixed packing (two or more UN numbers may apply)</td>
<td>F/1.00/19</td>
<td>No specific proposal</td>
<td>No specific proposal</td>
<td>Identified problem focused on mixed packing of: - special form material and non special form material - LSA and SCO WNTI/1.00/5 and WNTI/1.00/6 present specific solutions. See below.</td>
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<tr>
<td>WNTI/1.00/5</td>
<td>401 428 New subsection: 'MIXED PACKING' 5xx</td>
<td>401.1 430.1 New 5xx.1(referring to new 'MIXED PACKING' subsection)</td>
<td></td>
<td>Identified problem focused on mixed packing of special form material and non special form material.</td>
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<tr>
<td>WNTI/1.00/6</td>
<td>401 New 521bis New subsection: 'MIXED PACKING' 5xx</td>
<td>401.1 New 401.2 New 521bis.1 New 5xx.1(referring to new 'MIXED PACKING' subsection)</td>
<td></td>
<td>Identified problem focused on mixed packing of LSA and SCO Some of the proposals are the same that for mixed packing of special form and non special form material. See WNTI/1.00/5.</td>
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<td>General issue</td>
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<tr>
<td>Marking, placarding and documentation&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Visibility of package specification markings resulting from previous transport and not according to the present consignment.</td>
<td>D/1.00/8</td>
<td>537bis (new)</td>
<td>--</td>
<td>Connected with particular cases pointed out by WNTI/1.00/7; F/1.00/19 and ICAO/1.00/1. WNTI/1.00/7 presents alternative solutions. See below.</td>
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<tr>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>Marking and documentation rules for the transport of contents less restrictive than those approved for a specific package (Use a lower category of package type)</td>
<td>WNTI/1.00/7</td>
<td>New subsection after para.514: ‘PACKAGE HIERARCHY’ 5xx</td>
<td>New 5xx.1 (referring to ‘PACKAGE HIERARCHY’) New 5xx.2 (referring to ‘PACKAGE HIERARCHY’)</td>
<td>Introduction of a hierarchy of package types, allowing the use of a more appropriate UN number without having to change the mark corresponding to the package type</td>
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<td>F/1.00/19</td>
<td>No specific proposal</td>
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<td>No specific proposal</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>ICAO/1.00/1</td>
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<td>Identified problem focused on transport of Empty B(U) or B(M) packages. Particular reference is made to Empty B packages with depleted Uranium in the packaging shielding material. WNTI/1.00/7 presents specific solutions. See above.</td>
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</table>

<sup>1</sup> The marking, placarding and documentation to be considered in a specific shipment are a consequence of the consignment classification previously applied.
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<td>Identified problem focused on mixed packing of: special form material and non special form material LSA and SCO WNTI/1.00/5 and WNTI/1.00/6 present specific solutions. See above.</td>
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<tr>
<td>Comment No.</td>
<td>Para No.</td>
<td>Proposed Change/new regulatory text</td>
<td>Discussion/Reason</td>
<td>Recommendation/Reason for modification/rejection</td>
<td>WG resolution</td>
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<tr>
<td>6</td>
<td>530</td>
<td>Modify SSR-6 to establish clearer that the UN number to be selected and used in markings, placardings and transport documents shall be that corresponding to the radioactive material content no to the type of package design used.</td>
<td>From the para. 530 of SSR-6 may be followed that the UN to be assigned to the consignment should be that corresponding to the material transported and so corresponding to the type of package finally prepared. However, sometimes the meaning of the UN number derived from the classification of the content of the package doesn’t correspond with the identification mark of the type of package used for the transport of that material (for example, if we use a type B package to transport a material that could be transported in a type A package). This apparently discrepancy on the packages marks (UN and type of package) and also respect to the vehicle placarding (UN) often generates confusion to the authorities or participants along a transport. This problem is more evident in the case of packages subjected to approval that are authorized for different contents which may be classified according to...</td>
<td>See comments 18(D/1.00/8), 42 (F/1.00/19), 52 (WNTI/1.00/5), 53 (WNTI/1.00/6), 54 (WNTI/1.00/7)</td>
<td>A modification of SSR-6 is not required as the WG considers that is clear. However, the WG conclude an amendment to the Advisory Material could be beneficial.</td>
</tr>
<tr>
<td>E/1.00/1</td>
<td>Spain</td>
<td>Modify the TS-G-1-1. in accordance with the modifications in SSR-6 and to clarify more the issue.</td>
<td>Text revisions: 530. For each package or overpack, the UN number and proper shipping name shall be determined according to the actual radioactive material content carried in the package or overpack (see Table 1). In all cases of international transport of packages requiring competent authority approval of design or shipment, for which different approval types apply 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. 838. Each certificate of approval of the design of a package issued by a competent authority shall include the following information:...</td>
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**ANNEX III**
(l) A specification of the authorized radioactive contents, including any restrictions on the radioactive contents that might not be obvious from the nature of the packaging. This shall include the physical and chemical forms, the activities involved (including those of the various isotopes, if appropriate), the mass in grams (for fissile material, the total mass of fissile nuclides or the mass for each fissile nuclide, when appropriate) and whether special form radioactive material, low dispersible radioactive material or fissile material excepted under para. 417(f), if applicable. In case there are several authorized contents corresponding to different UN numbers, the certificate shall define for each content the UN number to be considered during the transport operations.

530.1. The implementation of the 1996 Edition of the Transport Regulations could lead to multiple labelling and marking as a consequence of divergence between approvals issued by different competent authorities. Known cases are Type B(U) versus Type B(M); approved package design versus special arrangement; and Type A, fissile versus Type IP, fissile. To avoid having to change the marking and labelling at border crossings, only one United Nations number (UN number), determined in accordance with para. 530, should be applied. The UN number and proper shipping name should be assigned different UN number. For example, a package with an approval certificate E/nnn/B(U)F-96 that permits two different contents:

- The first content would imply to classify the package as B(U)F
- For the second one would be enough to classified the package as A(F)

If we transport the second content, the UN corresponding to the consignment should be: UN 3327 RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE. This will be marked in the package, included in the transport documents and the UN number included in the placards of the vehicle. However, we will also find in the transport documents and in the package marking the identification mark of the package design approval: E/nnn/B(U)F-96, which connects with a different consignment classification: UN 3328 RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE.

Problem: it seems there is a contradiction which may conduct to confusion and to a different

<table>
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<tr>
<th>The WG agreed with the proposal to amend the para. 530.1 and 532.1 of the Advisory Material TS-G-1.1, but not to introduce a new para. 838.2 as it is not necessary to modify the para. 838 of SSR-6</th>
</tr>
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</table>
according to the actual radioactive material content carried in the package, that is, according to the final package prepared, independently of the type of the package design that is used to transport the material.

532.1. The UN number marked on the package and indicated in the documents is important information in the event of incidents and accidents. The UN number gives the information about the actual radioactive material content carried in the package that is needed for emergency management. Additionally, each overpack should be marked with the word “OVERPACK” and the UN marking unless all the package markings are clearly visible.

New 838.2.

A certificate of approval may refer to several authorized contents corresponding to different UN numbers. In that case, the identification mark of the certificate of approval will correspond with the content of maximum risk. However, independently of the type of package indicated in the identification mark, the UN number to be assigned during the transport shall be according to the actual radioactive material content carried in the package (See para. 530 of Regulations). Then, the certificate shall define for each content the UN number to be considered in the marking, placarding and transport documents. understanding of Regulations.

As examples of the potential confusion:

- The SSR-6 says in the para 530:

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 types apply 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.

- The TS-G-1.1. (DS 425 Draft 0.5) says in the para. 532.1.:

532.1. The UN number marked on the package and indicated in the documents is important information in the event of incidents and accidents. The UN number corresponding to the approval certificate issued by the
The competent authority of the country of origin of design gives the information about package type that is needed for emergency management...

It is considered that Regulations (SSR-6) is not enough clear on this matter as well as the TS-G-1.1. and some modification should be carry out on both documents to solve it.

| 18 | 537 | Add a new para under the headline “Marking” (after para 537) with the clear statement, that any marking, that do not relate to the current consignment shall be removed or covered like it is stated under para 538 for “Labelling”.

Text revisions (SSR-6):
Para 537bis: Any marking of the package that do not relate to the current consignment shall be removed or covered. |
| --- | --- | The question which has often been discussed concerns the visibility of package specification markings resulting from previous transport: Are the package specification markings allowed to be visible or is it required to make them invisible? Clarification within SSR-6 seems to be useful.

This issue should be resolved by the revision cycle by detailed discussion at a TM on the meaning of ‘any marking’ as it could be limited to any UN number and proper shipping name.

See comments 42 (F/1.00/19) and 54 (WNTI/1.00/7)

<p>| Germany | | The WG accepted the German proposal because it is justified but suggested there may not be a need to add new paragraphs, because the information may already exist in paragraphs 531 to 534 and 539. This should be explored and the proposal reformulated by Germany and presented to the next Review Cycle. |</p>
<table>
<thead>
<tr>
<th>42</th>
<th>France</th>
<th>F/1.00/19</th>
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<tr>
<td></td>
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<td>This issue should be defined as an ongoing issue. It should be examined by a working group of representatives from CA and from industry.</td>
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<tr>
<td>3.1</td>
<td>MIXED PACKING OF SPECIAL FORM AND NON-SPECIAL FORM IN A TYPE A PACKAGE</td>
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<td></td>
<td>No provision exists in SSR-6 or in TS-G-1.1 to solve the situation where two UN numbers and proper shipping names may apply, as it is the case for special form and non-special form radioactive material in a same Type A package, as allowed in para. 430.</td>
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<td>Paragraph 401 specifies that radioactive material shall be assigned to one of the UN numbers specified in Table 1.</td>
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<td>In Table 1, there are different UN numbers to use depending on whether the material is a special form radioactive material or not:</td>
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<td>UN2915 : non special form, non fissile or fissile excepted in a Type A</td>
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<td>UN3332 : SPECIAL FORM, non</td>
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<td>See comments 6(E/1.00/1), 18(D/1.00/8), 52 (WNTI/1.00/5), 53 (WNTI/1.00/6), 54 (WNTI/1.00/7).</td>
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<td>This is a major change (conceptual) and should be resolved by the revision cycle through discussion at a TM and/or CS.</td>
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<td>WG 1 Discussion: there was general agreement that the issue should be the subject of further study.</td>
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<td>The proposals 3.1. and 3.2. on Mixed Packing are similar to the proposals by WNTI/1.00/5 and WNTI/1.00/6, but France did not identify a specific proposal (See outcome WNTI/1.00/5 and WNTI/1.00/6 discussions)</td>
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</table>
fissile or fissile excepted in a Type A

UN3327 : non special form, FISSILE in a Type A

UN3333 : SPECIAL FORM, FISSILE in a Type A

Combinations of UN2915 + UN3332, or UN3327 + UN3333, should be clearly allowed, with clear marking and labeling rules.

3.2 MIXED PACKING OF LSA AND/OR SCO IN THE SAME INDUSTRIAL PACKAGE

No provision exists in the regulations to allow LSA and SCO, packed in separated inner packagings and requiring the same type of package, to be carried together in a same outer packaging.

Especially when using large
freight containers as type IP-2 (or IP-1, or IP-3) package, the possibility to mix LSA of different categories, and SCO of different categories could reduce the number of packages to be carried and the number of transports to be performed without reducing the safety.

3.3 PACKAGE TYPE DECLASSIFICATION

Difficulties often occur when a consignor wants to carry radioactive material in a package when quantities or activities are much smaller than authorised in that package, offering the possibility to use a lower category of package type, and more appropriate UN number and proper shipping name. Some examples of such situations are:

- How to carry less than 1 A$_2$ or 1 A$_1$ in a packaging approved as a Type B(U) package when containing greater activities of the same material?

The proposal 3.3. on package type declassification is similar to the proposal by WNTI/1.00/7 but France did not identify a specific proposal (See outcome WNTI/1.00/7 discussions)
Either use UN number and proper shipping name for Type A, but this requires to have the mark “Type A” on the package:
- Replace “Type B(U)” mark by “Type A” => Is it acceptable to change the permanent markings on a packaging which may be used as an approved package type? => difficult and costly some times
- Add “Type A” without deleting “Type B(U)”: but some CAs do not accept both marks at the same time on the package;
- Is it acceptable to keep other marks related to Type B(U) (design identification mark, trefoil symbol)?

Or use UN number and proper shipping name for Type B(U). But this creates unnecessary constraints for transport, and may lead emergency response
teams to take inappropriate protective measures in case of accident.

- How to carry fissile-exceptioned or non-fissile uranium hexafluoride in a packaging qualified to carry FISSILE uranium hexafluoride?
  - Either use UN number and proper shipping name for non fissile or fissile excepted uranium hexafluoride and confirm that for this content an IF or AF or B(U)F approval may be used instead of H(U) approval, but:
    - Some CAs disagree, arguing that, despite the complete compliance of the content to the requirement of the package approval, it was not conform to the title of the allowed content ("fissile uranium hexafluoride").
  - Or use UN number and proper shipping name for fissile uranium hexafluoride: But this creates unnecessary
constraints for transport (CSI and FISSILE label), and may lead emergency response teams to take inappropriate protective measures in case of accident.

The purpose is to solve ambiguous situations for classification when special form RAM or non-special form RAM are mixed in the same packaging and also to allow mixing of LSA with SCO and to define the operational provisions which have to be associated to the use of a declassified package type. In those two last cases solving the issues could lead to reduce cost of transports while improving safety (optimization).
At the last Working Group in April ICAO has adopted as an interim solution some notes to clarify the current situation and to try to facilitate the transport of these packages. Recognizing that the transport of these empty Type B (U) or Type B (M) packages does not pose any safety issue, the IAEA is requested to develop an easier solution and to perhaps consider these empty Type B (U) or Type B (M) packages an extension to the provisions for excepted packages of radioactive materials.

Empty Type B(U) or Type B(M) containers must very often be returned by air. Regularly shipments of these containers are not accepted and are refused by airlines, integrators and/or by their handling agent as currently these containers are transported under different conditions which lead to confusion and as a consequence results in a non-acceptance of the shipment.

Although the regulations for the transport of radioactive materials foresee that empty packages which have contained radioactive material may be classified as “excepted packages of radioactive material” unfortunately these containers can in several cases not be transported as “Radioactive material, excepted package – empty package” (UN 2908).

One of the conditions in order to be able to classify a package of radioactive material as an “excepted package of radioactive material” is that the radiation level at the external surface at any point may not exceed 5 µSv/h. (Para. 516 of SSR-6) Due to the presence of Guidance for classification of Empty Packaging other than UN 2908 should be included in a schedule of SSG-26 taking into account that specific case of packaging as integral part of their structure.

See if para 107(a) can be adapted.

See comments 3-4 (IR/1.00/1, IR/1.00/2.)

Unfortunately the ICAO representative was not present and the WG concluded further information was required by ICAO to inform the discussions.

ICAO should resubmit the proposal in consultation with the TSU for the next cycle with a specific long term solution to the issue.

WG 1 Discussion: general agreement that this should be discussed further; a note to ICAO TI will further inform the discussion.
| depleted Uranium in the shielding material of a Type B(U) or Type B(M) package a lot of these containers when shipped empty have a radiation level at surface which exceeds 5 μSv/h and as a consequence these empty containers are not allowed to be transported as UN 2908. As these empty packages cannot be shipped under UN 2908, shippers are using different methods and different solutions to transport these packages. This creates a lot of confusion for the airline’s or handling agent’s staff and which often results in refusal of the shipment. Some shippers choose to classify these packages as Low Specific Material (LSA-I) due to the presence of depleted uranium and the absence of any other radionuclide that needs to be fully classified. Other shippers prefer to classify these packages still as Type B (U) or Type B (M) package. Both solutions may create some misunderstanding which results in a non-acceptance of the shipment. In case the shipment is declared
as LSA-I the type B (U) container may be declared as an Industrial package Type IP-1 in which case the shipment does not require anymore a “Type B package design approval certificate” but the package must bear the appropriate markings for Industrial packages and the Type B (U) or Type B (M) specification markings as applicable should be obliterated. Airline and handling agent’s staff may not understand why a container which looks as a Type B (U) or Type B (M) may be declared as an IP-1 package and shippers may forget to obliterate the Type B (U) or Type B (M) specification markings. In the event the shipper continues to declare the package as a Type B (U) or Type B(M), the radionuclide contained in the shielding material and its chemical and physical form will be declared on the dangerous goods transport document e.g. “U-dep, solid, metal oxide”. This may lead to confusion as the Type B package design certificate indicates the radionuclides authorized for the package design.
<table>
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<tr>
<th>52</th>
<th>401, 428</th>
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<tbody>
<tr>
<td>WNTI/1.0 0/5</td>
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<td>WNTI</td>
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</table>

It is proposed to include in section V “mixed packing” provisions as already stated in para. 5.1.4 of 17th edition of the UN Model regulations, and to add appropriate provisions in para. 428.

Text revisions (SSR-6):

401. Except when the use of different UN numbers and proper shipping names is allowed by 5xx, radioactive material shall be assigned to one of the UN numbers specified in Table 1 in accordance with paras 408–434.

…

428. Packages containing radioactive material may be classified as Type A packages provided that the conditions of paras 429 and 430 are met. When para 430 applies, UN numbers and proper’s shipping names shall be determined as specified in para 5xx.

…

430. For mixtures of radionuclides whose identities and respective activities are known, the following condition shall apply to the radioactive contents of a Type A package:

\[
\sum \frac{B(i)}{A_1(i)} + \sum \frac{C(j)}{A_2(j)} \leq 1
\]

where

- \(B(i)\) is the activity of radionuclide i as special form radioactive material.
- \(A_1(i)\) is the A1 value for radionuclide i.
- \(C(j)\) is the activity of radionuclide j as other than special form radioactive material.
- \(A_2(j)\) is the A2 value for radionuclide j.

No provision exists in SSR-6 or in TS-G-1.1 regarding marking and labeling of packages, on the one hand, and transport documents, on the other hand, when two UN numbers and proper shipping names apply, as it is the case for special form and non-special form radioactive material in a same Type A package, as allowed in para. 430.

Paragraph 430 allows mixed packing of special form radioactive material together with no-special form radioactive material in the same Type A package.

In Table 1, there are different UN numbers to use depending on whether the material is a special form radioactive material or not:

- UN2915: non special form, non-fissile or fissile excepted in a Type A
- UN3332: SPECIAL FORM, non-fissile or fissile excepted in a Type A
- UN3327: non special form, FISSILE in a Type A
- UN3333: SPECIAL FORM, FISSILE in a Type A

Provisions to implement in case

This is a major change (conceptual) and should be resolved by the revision cycle through discussion at a TM and/or CS

See comments 6 (E/1.00/1), 42(F/1.00/19), 18(D/1.00/8), 53(WNTI/1.00/6), 54(WNTI/1.00/7)

WG 1 Discussion: further discussion in future TM/Working group setting.

The WG agreed that no changes in Regulations are required on this topic because SSR-6 is clear.

In general the discussions concluded that it is prudent and the practice to classify according to the most conservative form of the material. This should be clear and concise in the Advisory Material. The WG recommend that WNTI reformulate a proposal for the advisory material for the next Review Cycle.
New sub-section to be introduced in section V after par 504-506 (TRANSPORT OF OTHER GOODS) or 507 (OTHER DANGEROUS PROPERTIES OF THE CONTENTS):

MIXED PACKING

5xx. When radionuclides as special form radioactive material and as non special form are packed within the same Type A package, the package shall be marked as required for each radioactive material. Transport document of the package shall mention UN numbers and proper shipping names as marked on the package.

Text revisions (TS-G-1.1):

401.1. The UN numbers, each of which is associated with a corresponding proper shipping name, have the function of identifying dangerous goods, either as single entries for well-defined substances or articles or in as generic entries for well-defined groups of substances or articles. The UN numbers for radioactive material were agreed through joint international cooperation between the United Nations Committee of Experts on the Transport of Dangerous Goods and the IAEA. The system of identification by means of numbers is preferable to other forms of identification using symbols or language due to their relative simplicity in terms of international recognition. This identification can be used for many purposes. UN numbers which are harmonized with other combinations of UN2915 + UN3332, or UN2915 + UN3333, or UN327 + UN3333, or UN327 + UN3332 should be defined.
dangerous goods permit rapid and appropriate identification of radioactive goods within the broader transport environment of dangerous goods in general. Another example is the use of the UN numbers as a unique identification for emergency response operations. Each UN number can be associated with a unique emergency response advice table which permits first responders to refer to general advice in the unavoidable absence of a specialist. During the first stages of an emergency, this prepared information can be more easily accessible to a wide group of non-specialist emergency responders (see also paras 546.1–546.5).

430.1. The formula given in para 430 allows to pack in the same Type A package special form and non-special form radioactive materials. It can be used for mixtures of radionuclides and also for separate radionuclides (special form from one side and non-special form from the other side) contained in a single Type A package (see also para. I.86).

5xx.1 As already regulated in UN Model Regulations and in Modal Regulations, in the specific case where two separate materials or objects requiring each a different UN number and proper shipping name are packed in the same outer package as allowed by the regulations, then this is considered as being “mixed packing”. In this case both UN numbers and proper
<p>| 53 | WNTI/1.0 0/6 | shipping names apply. It is recommended that each kind of material should be packed in separated inner packagings. | The proposal extends the proposal WNTI-05 made to solve the case of special form and non-special form radioactive material packed in a same Type A package to that of LSA and SCO of various kinds in a same industrial package. It is proposed to include in section V “mixed packing” dispositions as already stated in para. 5.1.4 of 17th edition of the UN Model regulations, allowing to solve both cases (special and non-special form radioactive material in a type A and LSA and SCO from various kinds in a same industrial package), and to add appropriate provisions in subsection relative to REQUIREMENTS AND CONTROLS FOR TRANSPORT OF LSA MATERIAL AND SCO IN INDUSTRIAL PACKAGES. Text revisions (SSR-6): 401. Except when the use of different UN numbers and proper shipping names is allowed by 5xx, radioactive material shall be assigned to one of the UN numbers specified in Table 1 in accordance with paras 408–434. … New sub-section to be introduced after par 504-506 (TRANSPORT OF OTHER GOODS) or 507 (OTHER DANGEROUS PROPERTIES OF THE CONTENTS): No provision exists in the Regulations to allow the carriage of LSA and SCO, packed in separated inner packagings and requiring the same type of package, to be carried together in a same outer packaging. Especially in the case of use of large freight containers as IP-2 (or IP-1, or IP-3), the possibility to mix LSA of different categories, and SCO of different categories could reduce the number of packages to be carried, without reducing safety. This is a major change (conceptual) and should be resolved by the revision cycle through discussion at a TM and/or CS See comments 6 (E/1.00/1), 42(F/1.00/19), 18(D/1.00/8), 52(WNTI/1.00/5), 54(WNTI/1.00/7) The WG agreed that no changes in Regulations are required on this topic because SSR-6 is clear. The group agreed that it will be necessary to have a proposal for the Advisory Material, taking into account the guidance information that is being used by the United States of America (NUREG-1608). In general the discussions concluded that is prudent to use the most conservative form of material and to provide practical examples for the advisory material. |</p>
<table>
<thead>
<tr>
<th>MIXED PACKING</th>
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<th>The WG recommend that WNTI reformulate the proposal for the next Review Cycle.</th>
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<tbody>
<tr>
<td>5xx. When different radioactive materials, to which different UN numbers apply, are packed within the same package as allowed in sections IV or V, the package shall be marked as required for each radioactive material. Transport document of the package shall mention UN numbers and proper shipping names as marked on the package.</td>
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<td>517. The quantity of LSA material and SCO in a single Type IP-1, Type IP-2, Type IP-3 package, or object or collection of objects, whichever is appropriate, shall be so restricted that the external radiation level at 3 m from the unshielded material or object or collection of objects does not exceed 10 mSv/h. New paragraph to be introduced after para. 521: 521bis. LSA material and/or SCO from different groups may be packed together in the same Type IP-1, Type IP-2 or Type IP-3 package, provided each LSA or SCO is separated from each other, and the package type as specified in table 5 is suitable for each LSA or SCO. The different contents of the package shall not mix during routine conditions of transport, and normal conditions of transport when applicable. In that case, provisions in para 5xx for mixed packing apply.</td>
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<td>522. The total activity in a single hold or</td>
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compartment of an inland waterway craft, or in another conveyance, for carriage of LSA material and SCO in a Type IP-1, Type IP-2, Type IP-3 package or unpackaged, shall not exceed the limits shown in Table 6.

Text revisions (TS-G-1.1):
401.1. The UN numbers, each of which is associated with a corresponding proper shipping name, have the function of identifying dangerous goods, either as single entries for well-defined substances or articles or in as generic entries for well-defined groups of substances or articles. The UN numbers for radioactive material were agreed through joint international cooperation between the United Nations Committee of Experts on the Transport of Dangerous Goods and the IAEA. The system of identification by means of numbers is preferable to other forms of identification using symbols or language due to their relative simplicity in terms of international recognition. This identification can be used for many purposes. UN numbers which are harmonized with other dangerous goods permit rapid and appropriate identification of radioactive goods within the broader transport environment of dangerous goods in general. Another example is the use of the UN numbers as a unique identification for emergency response operations. Each UN number can be associated with a unique emergency response advice table which permits first responders to refer to general
advice in the unavoidable absence of a specialist. During the first stages of an emergency, this prepared information can be more easily accessible to a wide group of non-specialist emergency responders (see also paras 546.1–546.5).

401.2. For “mixed packing” see 5xx.1

5xx.1 As already regulated in UN Model Regulations and in Modal Regulations, in the specific case where two separate materials or objects requiring each a different UN number and proper shipping name are packed in the same outer package as allowed by the regulations, then this is considered as being “mixed packing”. In this case both UN numbers and proper shipping names apply. It is recommended that each kind of material should be packed in separated inner packagings.

5xx.2. This is applicable when, for example, special form and non-special form radioactive material are packed together in the same Type A package as allowed in para. 430, or when different kinds of LSA or SCO are packed together in the same Type IP package as allowed in para 521bis.

521bis.1. Different kinds of LSA or SCO may be packed in the same industrial package, especially when, large freight containers are used as IP-2 or IP-3 package. The different kinds of material or objects shall be separated from each other.
by packing them in separated inner packagings or wrapping material. The inner packagings should be stowed in the outer packaging by use of adequate bracing, and/or wedging, making mixture of those objects or material impossible in routine and normal conditions of transport when applicable.

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<th>54</th>
<th>WNTI/1.00/7</th>
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Two solutions exist to solve this problem with the existing rules:
- Either change the permanent mark of the package => difficult and costly for industry
- Or use the UN number and proper shipping name corresponding to the permanent mark of the package => unnecessary over classification leading to unnecessary precautions in case of accident.

Introduction of a hierarchy of package types in section V of the regulation, allowing, when carrying smaller quantities or smaller activities than allowed in the package design of origin, the use of a more appropriate UN number and associated proper shipping name, without having to change the mark corresponding to the package type.

This can be useful in terms of safety (effectively, more the UN number and the proper shipping name are appropriate, more emergency accident response will be appropriate in case of accident) and will simplify the implementation of the

Difficulties often occur when a consignor wants to carry radioactive material in a package when quantities or activities are much smaller than authorised in that package, offering the possibility to use a lower category of package type, and more appropriate UN number and proper shipping name. Some examples of such situations are:
- How to carry less than 1A2 or 1A1 in a packaging qualified as Type B(U) for a greater activity of that material?
  - Either use UN number and proper shipping name for Type A, but this requires to have the mark “Type A” on the package
    - Replace “Type B(U)” mark by “Type A” => is it acceptable to change the permanent

The WG considers that the proposal is complex and not very clear and there is no reason to create a new hierarchy for packaging to clarify the Regulations.
Regulation (no need to change a permanent mark on a package, if existing mark is that of a more robust package type).

Such a system exists already for portable tanks and other tanks in modal regulations and in UN model regulations (see para 4.2.5.2.5 of 17th edition of UN model regulations).

Text revisions (SSR-6):
Add a new sub-section to be introduced after par 514:

<table>
<thead>
<tr>
<th>PACKAGE HIERARCHY</th>
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<tr>
<td>5xx. With the following conditions:</td>
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<tr>
<td>• the package design of origin of the package complies with these Regulations;</td>
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<tr>
<td>• the contents of the package meets all applicable conditions and limits assigned for the package design of origin of the package,</td>
</tr>
<tr>
<td>• the package bears all the required marks, except those relating to UN number and proper shipping name, required for the package design of origin of that package,</td>
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</table>

(a) A Type C package may be classified as a Type B(U), a Type A, a Type IP-3, a Type IP-2, a Type IP-1 or an excepted markings on a packaging which may be used as an approved package type? => difficult and costly sometimes;

• Add “Type A” without deleting “Type B(U)”: but some CAs do not accept both marks at the same time on the package;
• Is it acceptable to keep other marks related to Type B(U) (design identification mark, trefoil symbol)?
  • Or use UN number and proper shipping name for Type B(U). But this creates unnecessary constraints for transport, and may lead emergency response teams to take inappropriate protective measures in case of accident.
  • How to carry fissile-excepted or non fissile uranium hexafluoride in a packaging qualified to carry FISSILE uranium
(b) A Type B(U) or a Type B(M) package may be classified as a Type A, a Type IP-3, a Type IP-2, a Type IP-1 or an excepted package,

(c) A Type A package may be classified as a Type IP-3, a Type IP-2, a Type IP-1 or an excepted package,

(d) A Type IP-3 package may be classified as a Type IP-2, a Type IP-1 or an excepted package,

(e) A Type IP-2 package may be classified as a Type IP-1 or an excepted package,

(f) A Type IP-1 package may be classified as an excepted package,

(g) Packages for FISSILE material may be classified for fissile-excepted or non-fissile material.

(h) Packages approved for 0.1 kg or more of UF6 may be classified as excepted package for less than 0.1 kg of UF6.

Text revisions (TS-G-1.1):

5xx.1 Package hierarchy permits to use packagings as packages from a lower category, without need to change the permanent markings affixed on the

hexafluoride?

- Either use UN number and proper shipping name for non fissile or fissile excepted uranium hexafluoride, but for this contents an H(U) approval is required:
  - May a IF or AF or B(U)F approval be used as H(U)?
    - Certainly, but the answer is not in the Regulations, creating confusion when such approval is listed in the transport document as being equivalent to H(U);
    - Some CAs refused this, arguing that, despite the complete compliance of the contents to the requirement of the package approval, it was not conform to the title of the allowed contents (“fissile uranium hexafluoride”).

- Or use UN number and proper shipping name for fissile uranium
packaging as required for their initial use. The principles are that for a given radioactive material, requirements for the design of the package containing the largest quantity or activity includes all those required for the packages containing lower quantities or activities.

5xx.2 As an example a packaging used as Type B(U) may be classified as a Type A provided:

- The Type B(U) package design approval certificate is not expired;
- The packaging fully comply with the Type B(U) package design approval certificate (design, permanent markings, maintenance, …);
- The contents fully comply with the contents allowed in the Type B(U) package design approval, except that the total activity meets the limit assigned to a Type A package;
- The UN number and proper shipping name may be that of a type A instead of that of a type B(U) package;
- The packaging is marked with the following information:
  o Consignor or consignee or both,
  o Permissible gross mass if in excess of 50 kg
  o UN2915, Radioactive material, type A package,
  o Type B(U)
  o Trefoil symbol resistant to hexafluoride: But this creates unnecessary constraints for transport (CSI and FISSLIE label), and may lead emergency response teams to take inappropriate protective measures in case of accident.
- effects of fire and water,
  - Identification mark allocated to the Type B(U) package design by the competent authority (example: A/133/B(U)-96)
  - Serial number of the packaging
- In the transport documents, only the information required for radioactive material in a Type A package is required.