1. IDENTIFICATION

Document Category: Specific Safety Guide

Working ID: DS521

Proposed Title: Radiation Protection Programmes for the Transport of Radioactive Material

Proposed Action: Revision of Safety Guide No. TS-G-1.3, Radiation Protection Programmes for the Transport of Radioactive Material, which was published in 2007

Review Committee(s) or Group: TRANSSC, EPreSC, RASSC

Technical Officer(s): Eric H. Reber

2. BACKGROUND

IAEA Safety Standards Series No. TS-G-1.3, Radiation Protection Programmes for the Transport of Radioactive Material, was published in 2007. The objective of TS-G-1.3 is to provide guidance on meeting the requirements for the establishment of radiation protection programmes for the transport of radioactive material, to optimize radiation protection in order to meet the requirements for radiation protection that underlie the Transport Regulations.

Since the publication of TS-G-1.3, the two publications in the Safety Requirements category that it primarily supports have been revised: once in the case of the BSS/GSR Part 3; and three times in case of TS-R-1/SSR-6. The revision of TS-G-1.3 is proposed to:

- Provide recommendations on how to meet the relevant requirements established in GSR Part 3 and SSR-6 (Rev. 1);
- Ensure consistency with other relevant IAEA safety standards that were published recently, e.g. GSR Part 2, GSR Part 7, GSG-7 and GSG-8;
- Incorporate the experience gained from the application of TS-G-1.3 by Member States.

This proposed revision of TS-G-1.3 is part of a plan (approved by TRANSSC) to revise all Safety Guides that support the Regulations for the Safe Transport of Radioactive Material, the most recent revision of which was published in 2018 as SSR-6 (Rev. 1).

3. JUSTIFICATION FOR THE PRODUCTION OF THE DOCUMENT

Revision of TS-G-1.3 is overdue in that since its publication, the two Safety Requirements publications that it primarily supports have been revised a total of four times. Due to a lack of resources and competing priorities, it has not been possible until now to revise this Safety Guide. Users of this publication will benefit from an updated version of the Safety Guide that is based on current safety standards and takes account of recent operating experience and current technology. A working group of TRANSSC 33 recommended that TS-G-1.3 be revised,
and identified approximately 25 issues to be addressed as part of the revision process. The report of this working group is provided in Annex 1 of this DPP.

4. OBJECTIVE

The objective of the proposed revision of TS-G-1.3 is to provide recommendations and guidance on meeting the requirements established in para. 302 of SSR-6 (Rev. 1) for a radiation protection programme for the transport of radioactive material.

The intended audience of the Safety Guide includes competent authorities, consignors, carriers and consignees, some of whom might not be familiar with the IAEA safety standards that address topics relevant to radiation protection programmes (e.g. occupational radiation protection, radiation protection of the public and protection of the environment, and protection of emergency workers and helpers). Details from other Safety Guides will not be included in the proposed Safety Guide unless they are directly applicable to radiation protection programmes for the transport of radioactive material.

5. SCOPE

The Scope of the proposed Safety Guide is the same as in the Transport Regulations (see para. 106 of SSR-6 (Rev 1)).

The Safety Guide will address the requirements for a radiation protection programme established in SSR-6 (Rev. 1): it will not provide recommendations on meeting the requirements for criticality safety (which are provided in SSG-27, Criticality Safety in the Handling of Fissile Material) or any non-radiological hazards associated with the transport of radioactive material.

6. PLACE IN THE OVERALL STRUCTURE OF THE RELEVANT SERIES AND INTERFACES WITH EXISTING AND/OR PLANNED PUBLICATIONS

The proposed publication will be a Specific Safety Guide in the group of safety standards on the safe transport of radioactive material. A table that provides an overview of the development of draft safety standards and other documents related to transport safety is provided in Annex 2.

Historically, the IAEA Transport Regulations and the supporting Safety Guides have not been co-sponsored by other international organizations. Regarding interaction with international organizations, ICAO, IMO and the UNECE are observers to TRANSSC and as such are invited to participate in discussions and provide input on draft standards.

The revised Safety Guide will interface with the following IAEA Safety Standards and other publications (this is not, and cannot be, regarded as an exclusive or exhaustive list):


7. OVERVIEW

The outline of the publication will be similar to that of the publication that is being revised.

1. INTRODUCTION
   Background
   Objective
   Scope
   Structure

2. RADIATION PROTECTION PROGRAMMES
   Objectives of radiation protection programmes
   Application of a graded approach

3. REQUIREMENT FOR AND SCOPE OF A RADIATION PROTECTION PROGRAMME IN TRANSPORT
   General
   Meeting safety requirements
   Elements of a radiation protection programme

4. BASIC ELEMENTS OF A RADIATION PROTECTION PROGRAMME AS A FUNCTION OF ASSESSED OCCUPATIONAL DOSES
   Occupational doses
   Graded approach

5. ASSIGNMENT OF ROLES AND RESPONSIBILITIES FOR THE ESTABLISHMENT OF A RADIATION PROTECTION PROGRAMME
   Responsibility for establishing a radiation protection programme
   Operator’s responsibilities
   Responsibilities of the competent authority

6. DOSE ASSESSMENT AND OPTIMIZATION
   Dose assessment principles
   Monitoring
   Methods of external dose assessment
   Internal dose assessment methods
   Dose limits, dose constraints and optimization

7. SURFACE CONTAMINATION
   Meeting requirements in respect of contamination
   Control of contamination

8. SEGREGATION AND OTHER PROTECTIVE MEASURES
   Segregation
   Limitation of exposure times
   Use of shielding and shielding techniques
   Controlled and supervised areas

9. EMERGENCY PREPAREDNESS AND RESPONSE
   General
   Protection of emergency workers and helpers
   Guidance values for restricting exposure for emergency workers

10. TRAINING
    Need for training
    Specific training and graded approach
11. MANAGEMENT SYSTEM FOR THE RADIATION PROTECTION PROGRAMME
General
Management system

REFERENCES
ANNEX I: GENERIC EXAMPLE OF A RADIATION PROTECTION PROGRAMME
ANNEX II: SPECIFIC EXAMPLE OF A RADIATION PROTECTION PROGRAMME FOR THE TRANSPORT OF RADIOPHARMACEUTICALS
ANNEX III: SPECIFIC EXAMPLE OF A RADIATION PROTECTION PROGRAMME FOR AN AIR CARGO CARRIER
ANNEX IV: SPECIFIC EXAMPLE OF A RADIATION PROTECTION PROGRAMME FOR AN INDUSTRIAL RADIOGRAPHY INSTITUTION
ANNEX V: SPECIFIC EXAMPLE OF A RADIATION PROTECTION PROGRAMME FOR PUBLIC AUTHORITIES
ANNEX VI: EVALUATION OF RADIATION PROTECTION PROGRAMMES
ANNEX VII: EXAMPLES OF TOTAL DOSE PER TRANSPORT INDEX
ANNEX VIII: SEGREGATION REQUIREMENTS FOR MARITIME TRANSPORT RADIATION PROTECTION
ANNEX IX: EXAMPLE OF CHECKLIST FOR ROAD TRANSPORT
ANNEX X: EXAMPLE OF RADIATION PROTECTION AND EMERGENCY RESPONSE INSTRUCTIONS FOR A VEHICLE OPERATOR

CONTRIBUTORS TO DRAFTING AND REVIEW

8. PRODUCTION SCHEDULE: Provisional schedule for preparation of the document, outlining realistic expected dates for each step (fill the column corresponding to your proposed document and delete the other columns):

<table>
<thead>
<tr>
<th>STEP 1: Preparing a DPP</th>
<th>A*</th>
<th>B*</th>
<th>C*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 2: Approval of DPP by the Coordination Committee</td>
<td>Q3, 2019</td>
<td>DONE</td>
<td>DONE</td>
</tr>
<tr>
<td>STEP 3: Approval of DPP by the relevant review Committees</td>
<td>Q4, 2019</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 4: Approval of DPP by the CSS</td>
<td>Q2, 2020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 5: Preparing the draft Indicate as to whether a TM is expected to be organized for the preparation of the draft</td>
<td>Q4, 2019 – Q3, 2020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 6: Approval of draft by the Coordination Committee</td>
<td>Q4, 2020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 7: Approval by the relevant review Committees for submission to Member States for comments</td>
<td>Q2, 2021</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 8: Soliciting comments by Member States</td>
<td>Q3, 2021</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 9: Addressing comments by Member States</td>
<td>Q4, 2021</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 10: Approval of the revised draft by the Coordination Committee Review in NSOC-SGDS (Technical Editorial review)</td>
<td>Q1, 2022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 11: Approval by the relevant review Committees</td>
<td>Q2, 2022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 12: - Submission to the CSS - Submission in parallel and approval by the Publications Committee - MTCD Editing - Endorsement of the edited version by the CSS</td>
<td>Q4, 2022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 13: Establishment by the Publications Committee and/or Board of Governors (for SF and SR only)</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP 14: Target publication date</td>
<td>Q2, 2023</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
*  
  
- Column A for Safety Fundamentals, Safety Requirements and Safety Guides.
- Column B for Nuclear Security Series publications
- Column C for TECDOCs, safety reports and other publications

9. RESOURCES
Estimated resources involved by the Secretariat (person-weeks) and the Member States (number and type of meetings)

Four one-week consultancy meetings
Two six-week home based assignments
Secretariat: 12 person-weeks
Annex 1

Report of Working Group 1 of TRANSSC33: TS-G.1.3 Radiation Protection Programmes for the Transport of Radioactive Material

Introduction

WG 1 was assigned to undertake a brief review of TS-G.1.3 to identify whether this document needs a revision using the following TOR.

TOR TS-G.1.3

Whilst operators adopt procedures that control the preparation, loading, transport and unloading of packages there can be a misunderstanding of the purpose of a radiation protection programme (RPP) how one is developed and how it is implemented. It is therefore considered that this document provides important guidance for operators and a review of its scope, content and presentation is needed to ensure it provides a comprehensive and understandable source of guidance information. It will also be useful to consider changes that may address findings relating to RPPs from compliance inspection programmes carried out in your country over the 10 years since TS-G.1.3 was published.

Discussion

The scope, structure and the content was discussed.

Key findings

- Add clarification why criticality safety is not included in the scope of TS-G.1.3.
- Update references to standards, facts and figures through the whole document (e.g. BSS)
- Add the use of ALARA in the objective
- Consider the exposure to the members of the public in demonstrating safety in transport of radioactive material (e.g. para 3.7)
- Use of terminologies and paragraph numbers in line with SSR-6
- Revise the dose rate of 20 μSv/h in the driver’s section (Para 8.10)
- Revise Chapter 9 to avoid repetition from TS-G.1.2 and provide concise provisions referring to TS-G.1.2
- Avoid duplication of text with SSR-6, TS-G.1.2, TS-G.1.4 and TS-G.1.5
- Complete revision of all annexes with updated information and examples (the examples are considered an essential part of TS-G.1.3, providing practical guidance and graded approach with illustration)
- Remove annex VII (already in SSR-6)
- Revise annex IX with help of IMO representative
- Annex X: Use of more relevant industry example; consider whether this checklist is necessary
- Annex XI: Move to TS-G.1.2

The discussion notes are presented in Attachment 1.

Recommendation

WG 1 recommends revision of TS-G1.3
Attachment 1

Discussion notes

- 3.6: split up into two parts: 1. transport within an establishment and 2. Dedicated carrier / shipper
- 3.7 and Ch. 4: add guidance for members of the public
- 3.9 (a): expand with examples, e.g. checks of package integrity and radiation levels
- 5.5: add guidance on the interrelation between RPP’s of consignors, carriers and consignees
- 5.13: clarify what is meant by ‘authority’
- Ch. 6: revise reference to 20 μSv/hr for drivers (new BSS)
- 6.1: clarify ‘routine and normal conditions’ (ref. SSR-6)
- 6.1.a(ii): align ‘reasonable accurate estimates’ to new BSS ‘conservative estimates’ (see also 6.12 and 6.16)
- 6.16 and annex VIII: be careful presenting figures without proper context
- 6.20: update with current (versions of) computer codes
- 6.21: consider adding examples (e.g. loading and unloading of NORM)
- 8.2: align definition of ‘critical group’ with new BSS
- 8.9: add example of ‘some protective measures’
- 8.10: Revise dose rate of 20 μSv/h in driver’s section
- Chapter 9: Revise Chapter 9 to avoid duplication of TS-G-1.2. Provide a concise summary with reference to TS-G-1.2
- Annex IX: take into account modal emergency response provisions (e.g. IMDG Code)
- Ch. 11: revise taking into account TS-G-1.4
- Annex I: take into account size of package considering the decrease of radiation levels with distance
- Annex I-V: add example for nuclear fuel cycle and different transport modes
- Annex II-10: add check of packages for contamination
- Annex III-13: add alerting first responders
- Annex VII: Remove annex VII
- Annex IX revise with input from IMO representative
- Annex X: Use of more relevant industry example
- Annex XI: Move to TS-G 1.2
Attachment 2

List of Participants:

1. S Sarkar, Australia (Chair)
2. M. Ter Morshuizen, Netherlands (Secretary)
3. M. T. Lizot, France
4. M Moutarde, France
5. L. Simeonova, Bulgaria
6. I. Petrova, Czech Republic
7. A. Bujnova, Slovakia
8. M. Davidsdottici, Denmark
9. S. Faille, Canada
10. R. Thorington, UK
11. J. Miller, ISSPA
12. T. Rijphema, AIPES
13. J. Safar, Hungary
14. J. Duffy, Ireland
15. A. Konnai, Japan
16. W. Cho, Korea
17. S. Hellsten
18. Badr Mohamed, Egypt
19. C. Elechosoa, Argentina
20. B. Desnoyers, WNTI
21. R. Boyle, USA
22. H. Zika, Sweden
23. F. Koch, Switzerland
24. A. Endres, Germany
25. M.A. Charette, Canada
26. C. Fasten, Germany
27. G. Ferran, France
28. A. Kirkin, Russia
29. V. Ershov, Russia
30. T. Cabianca, UK
31. A. Xavier, Brazil
32. O. Kervella

<table>
<thead>
<tr>
<th>DS 493 PDSR</th>
<th>DS 495 PDSR</th>
<th>DS 496 SSR26</th>
<th>DS 506 SSR28</th>
<th>DS 469 TS-G-1.2</th>
<th>DS 515 TS-G-1.5</th>
<th>DS 521 TS-G-1.3</th>
<th>TRANSSC Technical Expert Groups</th>
<th>TRANSSC</th>
<th>CSS</th>
<th>SSR-6 Review Cycle</th>
<th>UN Model Regs.</th>
<th>IMO Code</th>
<th>ICAO Technical Instructions</th>
<th>PRODUCTION SCHEDULE: Provisional schedule for preparation of safety documents, outlining realistic expected dates for each step</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2017</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td></td>
<td></td>
<td>2017</td>
<td>April</td>
<td>20th Ed</td>
<td>STEP 1: Preparing a DPP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>9</td>
<td>11</td>
<td>7</td>
<td>3</td>
<td>5</td>
<td></td>
<td>2017</td>
<td>34 / July</td>
<td></td>
<td>STEP 2: Approval of DPP by the Coordination Committee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>9</td>
<td>12</td>
<td>8</td>
<td>4</td>
<td>5</td>
<td></td>
<td>2017</td>
<td>35 / Dec</td>
<td>Nov</td>
<td>STEP 3: Approval of DPP by the relevant review Committees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**2018**

| Q1           | 13          | 9             | 10            | 5             | 6             | ToR / Programme | 2016 Ed | 2016 | 2018 Ed | STEP 4: Approval of DPP by the CSS |                |          |                           |                                  |
| Q2           | 14          | 7             | 7             | 1             | 2             | 3              | 2018 Ed | 2018 |          | STEP 5: Preparing the draft. Indicate as to whether a TM is expected to be organized for the preparation of the draft |                |          |                           |                                  |
| Q3           | 8           | 8             | 5             |                |                |                | 2018 Ed | 2018 |          | STEP 6: Approval of draft by the Coordination Committee |                |          |                           |                                  |
| Q4           | 8           | 9             | 9             | 4             | 5             |                | 2018 Ed | 2018 |          | STEP 7: Approval by the relevant review Committees for submission to Member States for comments |                |          |                           |                                  |

**2019**

| Q1           | 9           | 10            | 10            | 5             | 1             | Annual Report / Programme | 2019-20 Ed | 2019-20 | 2019-20 | STEP 8: Soliciting comments by Member States |                |          |                           |                                  |
| Q2           | 11          | 11            | 5             |                |                |                | 2019-20 | 2019-20 |          | STEP 9: Addressing comments by Member States |                |          |                           |                                  |
| Q3           | 6           | 2             |                |                |                |                | 2019-20 | 2019-20 |          | STEP 10: Approval of the revised draft by the Coordination Committee |                |          |                           |                                  |

**2020**

| Q1           | 12          | 8             | 9             | 5             |                | Annual Report / Programme | 2018 Ed | 2018 | 2018 Ed | Committee. Review in NS-SSCS |                |          |                           |                                  |
| Q2           | 12          | 14            | 12            | 10            | 4             | 5              | 2018 Ed | 2018 |          | STEP 11: Approval by the relevant review Committees |                |          |                           |                                  |
| Q3           | 14          | 14            | 1             | 2             | 5             |                | 2018 Ed | 2018 |          | STEP 12: Endorsement by the CSS |                |          |                           |                                  |

**2021**

| Q1           | 5           |                |                |                |                | Annual Report / Programme | 2021-22 Ed | 2021-22 | 2021-22 | STEP 13: Establishment by the Publications Committee and/or Board of Governors (for SF and SR only)) |                |          |                           |                                  |
| Q2           | 12          | 4             | 5             | 7             |                |                | 2021-22 | 2021-22 |          | STEP 14: Target publication date |                |          |                           |                                  |
| Q3           | 5           | 8             |                |                |                |                | 2021-22 | 2021-22 |          | STEP 15: Target publication date |                |          |                           |                                  |
| Q4           | 14          | 5             | 9             |                |                |                | 2021-22 | 2021-22 |          | STEP 16: Final approval |                |          |                           |                                  |

**2022**

| Q1           | 9           | 6             | 10            |                |                | Annual Report / Programme | 2020 Ed | 2020 | 2020 Ed | STEP 17: Final approval |                |          |                           |                                  |
| Q2           | 7           | 11            |                |                |                |                | 2020 Ed | 2020 |          | STEP 18: Final approval |                |          |                           |                                  |
| Q3           | 8           | 12            |                |                |                |                | 2020 Ed | 2020 |          | STEP 19: Final approval |                |          |                           |                                  |
| Q4           | 9           | 12            |                |                |                |                | 2020 Ed | 2020 |          | STEP 20: Final approval |                |          |                           |                                  |

**2023**

| Q1           | 9           | 10            |                |                |                | Annual Report / Programme | 2023-24 Ed | 2023-24 | 2023-24 | PRODUCTION SCHEDULE: Provisional schedule for preparation of safety documents, outlining realistic expected dates for each step |                |          |                           |                                  |
| Q2           | 11          | 14            |                |                |                |                | 2023-24 | 2023-24 |          | PRODUCTION SCHEDULE: Provisional schedule for preparation of safety documents, outlining realistic expected dates for each step |                |          |                           |                                  |
| Q3           | 12          | 47            | 11            | 14            |                |                | 2023-24 | 2023-24 |          | PRODUCTION SCHEDULE: Provisional schedule for preparation of safety documents, outlining realistic expected dates for each step |                |          |                           |                                  |