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. In addition, two Safety Guides (GSG-7 Occupational Radiation Protection and GSG-8 Radiation Protection of the Public and the Environment) have been published to provide recommendations for the implementation of GSR Part 3. 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. Although guidance has already been provided by
GSG-7 and GSG-8 with regard to occupational radiation protection and radiation protection of the public and the environment, 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 should 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, with due consideration of already published IAEA General Safety Guides dealing with radiation protection.

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), others may however already carry out other practices requiring the implementation of radiation protection measures (for example, the operator of nuclear installation, a nuclear medicine department or an industrial radiographer). 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. In this case, to ensure consistency within the IAEA Safety Standards series, either the text from these Safety Guides will be cited between quotation marks or DS521 will refer to the relevant paragraphs of these Safety Guides without any attempt to summarize the recommendations.

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) and GSR Part 3; it will provide recommendations on meeting the requirements for criticality safety by making reference to the recommendations provided in SSG-27, Criticality Safety in the Handling of Fissile Material; it will not provide recommendations for 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. 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
5. DOSE ASSESSMENT AND OPTIMIZATION
   Dose assessment principles
   Monitoring
   Methods of external dose assessment
   Internal dose assessment methods
   Dose limits, dose constraints and optimization
6. SURFACE CONTAMINATION
   Meeting requirements in respect of contamination
   Control of contamination
7. SEGREGATION AND OTHER PROTECTIVE MEASURES
   Segregation
   Limitation of exposure times
   Use of shielding and shielding techniques
   Controlled and supervised areas
8. EMERGENCY PREPAREDNESS AND RESPONSE
   General
   Emergency Preparedness
   Emergency Response
   Protection of emergency workers and helpers
9. TRAINING
   Need for training
   Specific training and graded approach
10. 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
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):

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* 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
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16. W. Cho, Korea
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18. Badr Mohamed, Egypt
19. C. Elechosa, 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
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