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Document Preparation Profile (DPP)
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1. IDENTIFICATION

Document Category or set of publications to be revised in a concomitant manner

General Safety Guide

Working ID: DS504

Proposed Title: Arrangements for Preparedness and Response for a Nuclear or Radiological Emergency

Proposed Action: Revision of GS-G-2.1, Arrangements for Preparedness for a Nuclear or Radiological Emergency, STA/PUB/1265, 2007

Review Committee(s) or Group: EPRSC, RASSC, WASSC, TRANSSC, NUSSC, NSGC

Technical Officer(s): Svetlana NESTOROSKA MADJUNAROVA, NS-IEC

2. BACKGROUND

The IAEA Safety Standards Series publication No. GS-G-2.1 was published in 2007 to provide guidance and recommendations to Member States in applying the requirements contained in the IAEA Safety Standards Series publication No. GS-R-2, *Preparedness and Response for a Nuclear or Radiological Emergency*, issued in 2002. The primary objectives of GS-G-2.1 are (1) to provide guidance on those selected elements of the requirements in GS-R-2 for which guidance has been requested by Member States and for which there is an international consensus on the means to meet these requirements; (2) to describe appropriate responses to a range of emergencies; and (3) to provide background information, where appropriate, on the past experience that provided a basis for the requirements in GS-R-2, thus helping the user to better implement arrangements that address the underlying issues.

To meet these primary objectives, GS-G-2.1 elaborates the basic concepts in nuclear or radiological emergency preparedness and response (EPR), provides more specific guidance and recommendations on a select number of General, Functional, and Infrastructure Requirements from GS-R-2, and describes the concept of operations for various types of nuclear or radiological emergencies. Additionally, it contains appendices with guidance on typical threat categories for emergency planning purposes, area and zone sizes, dangerous sources, emergency classes for facilities, an overview of urgent protective actions and other actions, response time objectives, urgent protective actions off the site, and a description of necessary emergency facilities and locations. Brief information on the technical basis for emergency planning zone sizes is also provided in an Annex to GS-G-2.1.

In 2011, additional Safety Guide publication in EPR was issued. The IAEA Safety Standards Series No. GSG-2 on *Criteria for use in Preparedness and Response for a Nuclear or Radiological Emergency* provides further guidance and recommendations in relation to generic and operational criteria to support decision-making on protective actions and other response actions in an emergency. These criteria superseded the concept of generic intervention levels and generic action levels contained in GS-R-2 and applied in GS-G-2.1.

In 2015, the revised safety requirements in EPR were published as Part 7 of the General Safety Requirements publications (*Preparedness and Response for a Nuclear or Radiological Emergency*, IAEA Safety Standards Series No. GSR Part 7, Vienna, 2015). Although GSR Part 7 follows to a great extent the contents and structure

of its earlier edition GS-R-2, GSR Part 7 strengthened the set of requirements necessary to ensure an adequate level of preparedness and response for a nuclear or radiological emergency irrespective of its cause. Namely, GSR Part 7 establishes strengthened requirements for various EPR aspects such as the emergency management system, hazard assessment, protection strategies for a nuclear or radiological emergency and their justification and optimization, emergency planning zones and distances, resilience of emergency arrangements against a range of hazardous conditions, protection of emergency workers and helpers, termination of an emergency, international assistance and cooperation in case of a transboundary emergency, interfaces with nuclear security, analysis of an emergency and emergency response etc. While most of these concepts were part of GS-R-2 to some extent, many of them are new in the light of the most recent developments and experiences in the area.

In addition, two new Safety Guides in EPR area were approved for development in 2013. They are expected to support the implementation of a number of requirements in GSR Part 7 through provision of guidance and recommendations on the arrangements for the termination of a nuclear or radiological emergency (DS474) and on arrangements for public communications in preparedness and response for a nuclear or radiological emergency (DS475).

In the light of these recent developments, there was a necessity to review GS-G-2.1 and to identify any need for its revision to ensure it adequately supports the application of the recent safety requirements contained in GSR Part 7 with account taken of its relationship with other EPR related safety standards either published or under development [as well as other recently published Safety Standards and Nuclear Security publications](#). To do so, the guidance and recommendations contained in GS-G-2.1 as well as in other EPR related safety guides (published or under development) were reviewed against each of the 26 overarching requirements in GSR Part 7. An analysis was performed to identify where, and to what degree, the requirements are addressed with further guidance in these safety guides. In each case, observations were made regarding the completeness of the guidance in GS-G-2.1 and, whether the existing guidance or guidance under development addresses sufficiently the revised requirements. The results from this review are provided in Appendix 1, while the detailed analysis is provided in Annex 1.

Since GS-G-2.1 has been implemented by a number of Member States since 2007, Member States were also given an opportunity to provide their feedback on usefulness of GS-G-2.1 and any changes they would like to see in future. To do so, a questionnaire was distributed to all Contact Points registered in the Unified System for Information Exchange in Incidents and Emergencies (USIE) to gather feedback on the usefulness of GS-G-2.1 and the manner in which it can be improved. The questionnaire solicited input on the changes, if any, the respondents would like to see in the content of GS-G-2.1 and in the structure of the guidance provided. The analysis of the feedback obtained is provided in Appendix 2. The questionnaire is reproduced in Annex 2.

Finally, a working group (WG) under the Emergency Preparedness and Response Standards Committee (EPRReSC) was established to review GS-G-2.1 and to discuss its future. Summary of the discussion among the WG members is provided in Appendix 3.

The proposed DPP and the proposed revision of GS-G-2.1 reflect the results of the abovementioned activities as well as the discussions at the second and third EPRReSC meetings.

3. JUSTIFICATION FOR THE PRODUCTION OF THE DOCUMENT

Considering that GS-G-2.1 was in use for almost 10 years as well as the various developments since its publication in 2007 (elaborated in Section 2), GS-G-2.1 needs to be revised so that it better addresses how specific requirements in GSR Part 7 can be met taking into account the existing guidance or those under development. The revision will allow for (1) ensuring consistency in terminology and concepts with GSR Part 7, (2) removing outdated guidance or guidance which has been addressed in more recent EPR related safety standards, either in place or under development [as well as other recently published Safety Standards and Nuclear Security publications](#), (3) ensuring appropriate cross-references are given to various EPR related safety standards, (4) providing more detailed guidance on a number of requirements in GSR Part 7, such as those for

infrastructure, which are essential for an effective emergency response capability, and (5) addressing equally-all the five emergency preparedness categories with common guidance.

With this revision, Member States are expected to be provided with more comprehensive guidance that facilitates the application of GSR Part 7 for all the five emergency preparedness categories consistently with more recent EPR related safety standards.

It should be recognized that even the revised GS-G-2.1 cannot provide complete guidance on all requirements in GSR Part 7, for example, either due to their specifics to certain type of emergency or to specific facility or activity or due to specifics of the topic (e.g. addressing very specific group of target audience). Thus, only general reference or not reference at all will be given to some topics in EPR which would remain for consideration in other future for other guidance publications to be developed later. Such topics include, but are not limited to, mitigatory actions, emergency classification, assessment of the situation, medical EPR, dealing with non-radiological consequences etc. On the other hand, other topics, such as the concept of a dangerous source, were not identified to require any revision.

4. OBJECTIVE

The objective of the revised Safety Guide is to provide guidance and recommendations to Member States on arrangements for preparedness and response for a nuclear or radiological emergency, irrespective of its cause, in support of a selected number of requirements in GSR Part 7.

The target audience are emergency planners at various levels (governments, response organizations, operating organizations, regulatory bodies) with responsibilities to prepare adequately to respond effectively to any nuclear or radiological emergency as well as personnel of the response organizations, operating organizations and regulatory bodies involved in emergency preparedness and response.

5. SCOPE

The revised Safety Guide will apply to all facilities and activities. It will address all nuclear or radiological emergencies irrespective of the initiating event, consistent with GSR Part 7.

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

Within the IAEA Safety Standards Series, this Safety Guide will be part of the General Safety Guides supporting primarily GSR Part 7 as well as Section IV on emergency exposure situations of GSR Part 3.

This Safety Guide will interface with at least the following international conventions and IAEA Safety Standards:

1. INTERNATIONAL ATOMIC ENERGY AGENCY, Convention on Early Notification of a Nuclear Accident and Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Legal Series No. 14, IAEA, Vienna (1987);
2. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL CIVIL AVIATION ORGANIZATION, INTERNATIONAL LABOUR ORGANIZATION, INTERNATIONAL MARITIME ORGANIZATION, INTERPOL, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, PREPARATORY COMMISSION FOR THE COMPREHENSIVE NUCLEAR-TEST-BAN TREATY ORGANIZATION, UNITED NATIONS ENVIRONMENT PROGRAMME, UNITED NATIONS OFFICE FOR THE CO-ORDINATION OF HUMANITARIAN AFFAIRS, WORLD HEALTH ORGANIZATION, WORLD METEOROLOGICAL ORGANIZATION, Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSR Part 7, IAEA, Vienna (2015);

3. INTERNATIONAL ATOMIC ENERGY AGENCY, Governmental, Legal and Regulatory Framework for Safety, IAEA Safety Standards Series No. GSR Part 1 (Rev. 1), IAEA, Vienna (2016);
4. EUROPEAN COMMISSION, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANIZATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, UNITED NATIONS ENVIRONMENT PROGRAMME, WORLD HEALTH ORGANIZATION, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, IAEA Safety Standards Series No. GSR Part 3, IAEA, Vienna (2014);
5. INTERNATIONAL ATOMIC ENERGY AGENCY, Leadership and Management for Safety, IAEA Safety Standards Series No. GSR Part 2, IAEA, Vienna (2016);
- 5-6. INTERNATIONAL ATOMIC ENERGY AGENCY, Safety Assessment for Facilities and Activities, IAEA Safety Standards Series No. GSR Part 4 (Rev. 1), IAEA, Vienna (2016);
- ~~6-7.~~ FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR OFFICE, PAN AMERICAN HEALTH ORGANIZATION, WORLD HEALTH ORGANIZATION, Criteria for Use in Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSG-2, IAEA, Vienna (2011).

The Safety Guide will interface with at least the following documents under revision or development:

- ~~7-8.~~ INTERNATIONAL ATOMIC ENERGY AGENCY, Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material, IAEA Safety Standards Series No. TS-G-1.2 (ST-3), IAEA, Vienna (2002) (under revision, DS469);
- ~~8-9.~~ DS475: Arrangements for Public Communications in Preparedness and Response for a Nuclear or Radiological Emergency;
10. DS474: Arrangements for the Termination of a Nuclear or Radiological Emergency;
- ~~9-11.~~ Considerations for the Development of a Protection Strategy for a Nuclear or Radiological Emergency.

The following recommendations publication of the ICRP will also support the development of this Safety Guide:

12. INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION, The 2007 Recommendations of the International Commission on Radiological Protection, ICRP Publication 103, Ann. ICRP 37 (2-4), Elsevier (2007);
- ~~10-13.~~ INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION, Application of the Commission's Recommendations for the Protection of People in Emergency Exposure Situations, ICRP Publication 109, Ann. ICRP 39 (1), Elsevier (2009).

The Safety Guide will be an interface document as it will address nuclear or radiological emergencies irrespective of the cause as well as respective interfaces with nuclear security in EPR as GSR Part 7 does. However, this Safety Guide will keep its focus on the emergency arrangements themselves while highlighting the need for coordination and integration with nuclear security in various areas consistently with GSR Part 7. When doing so, it will be borne in mind that EPR and nuclear security are likewise important in achieving the common goal of protecting human life and health, society and the environment against the harmful effects of ionizing radiation and measures to be taken must be mutually acceptable in both areas. To this end, guidance on nuclear security issued in the IAEA Nuclear Security Series will be respected.

All relevant sections in the IAEA's Department of Nuclear Safety and Security will be consulted, as appropriate, throughout the drafting and review process.

Interest for co-sponsoring this Safety Guide is expected by the relevant international organizations - members of the Inter-agency Committee for Radiological and Nuclear Emergencies (IACRNE) that are already co-

sponsoring GS-G-2.1 and GSR Part 7. The interactions with these organizations will be coordinated by the Technical Officer within the framework of IACRNE.

7. OVERVIEW

The Safety Guide is expected to cover the following contents:

1. Introduction
(This Section is expected to cover the Background, Objective, Scope and Structure of the Safety Guide).
2. General Requirements
(This Section is expected to address in particular the guidance on how to meet the overarching requirements 1, 2 and 4 of GSR Part 7. It will follow to great extent the content of current GS-G-2.1 but revised for consistency with GSR Part 7 and addressing in details aspects which currently lack adequate guidance).
3. Functional Requirements
(This Section is expected to address the guidance on how to meet various requirements under the overarching requirements 6, 7, 9, 14, 17, and 19 of GSR Part 7. It will follow to some extent the current GS-G-2.1 but revised for consistency with GSR Part 7, GSG-2, DS474 and DS475. It is expected that some parts of GS-G-2.1 which are elsewhere covered to be removed and other aspects that currently lack adequate guidance to be elaborated in more details).
4. Requirements for Infrastructure
(This Section is expected to address in details the guidance on how to meet the overarching requirements 20-26 of GSR Part 7. It will greatly expand the limited guidance currently provided in GS-G-2.1).
5. Concept of operations
(This Section is expected to follow to great extent the current guidance in GS-G-2.1 but revised for consistency with GSR Part 7).

Appendices

(The Safety Guide is expected to have a number of Appendices that follow to a great extent those currently available in GS-G-2.1 but expanded with additional ones deriving from the expanded guidance provided in Sections 2 to 4 described above. The appendices are expected to cover topics such as: Typical Emergency Preparedness Categories (consistently with GS-G-2.1); Emergency Planning Zones and Distances (revised in line with the strengthened concept in GSR Part 7) including a methodology for deriving typical area sizes; Dangerous sources (consistently with GS-G-2.1); Response time objectives (consistently with GS-G-2.1); Emergency Response Facilities and Locations (consistently with GS-G-2.1); Typical emergency response organization; Templates for emergency plans and procedures; Typical training programme; Typical exercise regime etc.).

References

Annexes

(The Safety Guide is expected to also have a number of Annexes that provide information supporting the guidance and addressing topics such as exposure pathways in an emergency, etc.).

Contributors to Drafting and Review

8. PRODUCTION SCHEDULE:

| | |
|---|---------|
| | A* |
| STEP 1: Preparing a DPP | Q4 2016 |
| STEP 2: Approval of DPP by the Coordination | Q1 2017 |

| | |
|---|-----------------------------|
| Committee | |
| STEP 3: Approval of DPP by the relevant review Committees | Q2 2017 |
| STEP 4: Approval of DPP by the CSS | Q4 2017 |
| STEP 5: Preparing the draft Indicate as to whether a TM is expected to be organized for the preparation of the draft | 2018 – 2019 (TM Q4 2019) |
| STEP 6: Approval of draft by the Coordination Committee | Q1 2020 |
| STEP 7: Approval by the relevant review Committees for submission to Member States for comments | Q3 2020 |
| STEP 8: Soliciting comments by Member States | Q3 2020 – Q4 2020 |
| STEP 9: Addressing comments by Member States | Q4 2020 – Q1 2021 |
| STEP 10: Approval of the revised draft by the Coordination Committee Review in NS-SSCS | Q1 2021 |
| STEP 11: Approval by the relevant review Committees | Q2 2021 |
| STEP 12: Endorsement by the CSS | Q4 2021 |
| STEP 13: Establishment by the Publications Committee | Q4 2021 |
| STEP 14: Target publication date | Q3 2022 |

9. RESOURCES

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

- Secretariat: 40 person-weeks
- Member States: 6 consultancy meetings and 1 technical meeting

APPENDIX 1

Review of GS-G-2.1 and other EPR related safety standards against GSR Part 7

The guidance and recommendations contained in GS-G-2.1 as well as in IAEA Safety Standards Series No. GSG-2 and other EPR related safety standards published or under development were reviewed against each of the 26 overarching requirements in GSR Part 7. An analysis was performed to identify where, and to what degree, the requirements are addressed in these safety guides. In each case, observations were made regarding the completeness of the guidance in GS-G-2.1 and, whether the existing guidance or guidance under development addresses sufficiently the revised requirements.

A cross-reference matrix showing the detailed results of the review and the analysis is included in Annex 1.

Results of the review

The results from this review and analysis indicate the following:

- Some requirements contained in GSR Part 7 are well covered by the guidance and recommendations contained in the existing safety guides or the safety guides under development, and sufficiently address the five emergency preparedness categories.
- Some requirements contained in GSR Part 7 are new and are therefore not addressed at all in the existing safety guides, and are out of the scope of the safety guides under development.
- Some requirements are somewhat covered in the existing and upcoming safety guides but require more work because the guidance is insufficient, is no longer fully consistent with the revised requirements, or is too general.
- In some cases, guidance is provided but spread across several safety guides.

Based on these results, a revision of GS-G-2.1 is necessary to provide guidance and recommendations that both meets the revised requirements in GSR Part 7 and also provides the necessary specificity for Member States who chose to implement the safety guide.

Specifically with regards to GS-G-2.1, the analysis suggests that:

- The following guidance and recommendations contained in current GS-G-2.1 do not require significant revision:
 - o Roles and responsibilities in EPR (with the exception of the revised roles and responsibilities for the national coordinating mechanism);
- The following guidance and recommendations of GS-G-2.1 are covered with other recently published safety guides or those under development and should be taken out of the scope of any future revision of GS-G-2.1:
 - o System for implementing protective actions and other response actions including criteria to do so;
 - o Arrangements for public communications in EPR.
- The following guidance and recommendations are addressed in the current GS-G-2.1 but they require revision to be fully consistent with GSR Part 7:
 - o Emergency management system;
 - o Hazard assessment;
 - o Arrangements for taking of urgent and early protective actions (taking into account guidance and recommendations provided in GSG-2 in line with previous bullet);
 - o Emergency planning zones and distances including methodology for deriving the size.
- The following guidance and recommendations are addressed in the current GS-G-2.1 but lack details and require particular attention:
 - o Hazard assessment, in terms of methodology;

- Arrangements for identifying, notifying and activating in terms of: basis for emergency classification and EALs for various facilities and activities beyond LWRs; and guidance for off-site notification points (functions, characteristics etc.);
- Mitigating non-radiological consequences (taking into account developments under DS475);
- All the infrastructural elements as following:
 - Assignment of authorities per function;
 - Organizations (on-site and off-site), identification of various positions in the organization including their roles and responsibilities in EPR and staffing recommendations;
 - Guidance for development of plans and procedures at various levels including templates of them and for their evaluation;
 - Guidance on qualifications for various positions in emergency response organization as well as on training programmes for various emergency workers, the frequency of training, its evaluation etc.;
 - Guidance of exercise regime and exercise programme, its objectives, frequencies, evaluation, and observation;
 - Quality management in EPR.
- The following guidance and recommendations are not part of GS-G-2.1 but elsewhere in the published safety guides or in those under development and thus, may not be appropriate for consideration in the future of GS-G-2.1:
 - Protection strategy for a nuclear or radiological emergency;
 - Protection of emergency workers and helpers;
 - Radioactive waste management following a nuclear or radiological emergency;
 - Termination of a nuclear or radiological emergency;
 - Issuing warning and instructions to the potentially or actually affected public.
- The following areas lack guidance and recommendations to support GSR Part 7 implementation and are not covered elsewhere at a safety guide level:
 - Managing operations in emergency response including on transition from normal operation to emergency response and on unified command and control system;
 - Taking mitigatory actions in relation to generic guidance needed to support specific safety standards;
 - Arrangements for requesting, receiving and providing international assistance;
 - Analysis of an emergency and the emergency response;
 - Medical preparedness and response particularly in relation to: identifying clinical symptoms indicative to radiation emergency and notification procedures; on-site medical response of specific facilities taking into account specifics of the facilities that could be potentially involved in an emergency; and effective off-site medical response;
 - Continuous assessment of the situation including monitoring with the aim to inform the decision-making processes and to facilitate the implementation of protective actions and other response actions and sharing of the information.

Based on these results, a revision of GS-G-2.1 appears necessary to provide guidance and recommendations that both meet the revised requirements in GSR Part 7 and also provides the necessary specificity for Member States who choose to implement requirements in GSR Part 7. From the analysis, some areas may remain as they are in GS-G-2.1, while others may need to be removed as they are covered in other safety guides (published or under development). But some areas that require additional guidance or are currently not addressed in any safety guide (published or under development) need to be reconsidered in terms of their appropriateness and user-friendliness, considering if it should be in a single revised GS-G-2.1 or spread among multiple safety guides in addition to GS-G-2.1.

The guidance development should give priority to those areas that are currently not addressed in necessary detail or at all with specific guidance and recommendations at the safety guide level publication (published or under development). The guidance development should also consider the existence of practical guidance in various formats, such as TECDOCS and EPR series documents, to further refine the priorities for GS-G-2.1 revision and additional guides needed.

APPENDIX 2

Member States' feedback on GS-G-2.1

A questionnaire was distributed to all Contact Points registered in the Unified System for Information Exchange in Incidents and Emergencies (USIE) to gather feedback on the usefulness of GS-G-2.1 and the manner in which it can be improved. The questionnaire, reproduced in Annex 2, solicited input on the changes, if any, the respondents would like to see in the content of GS-G-2.1 and in the structure of the guidance provided.

Analysis of the feedback received

Responses to the questionnaire were received from 33 contact points in 31 Member States.

The following Member States responded to the questionnaire:

- Armenia
- Australia
- Bangladesh
- Belarus
- Belgium
- Bulgaria
- Canada
- Greece
- Indonesia
- Ireland
- Israel
- Japan
- Kuwait
- Lithuania
- Malta
- Mauritius
- Mexico
- Morocco
- Netherlands
- Nicaragua
- Norway
- Poland
- Romania
- Russian Federation
- Singapore
- Slovakia
- Sri Lanka
- Switzerland
- Turkey
- United States of America
- Uruguay

The responses included Member States with all five emergency preparedness categories and a wide variety of facilities and activities within their territory. The following emergency preparedness categories were listed in the responses, noting that some Member States did not specify which categories were applicable:

| EP Category | Number of Responses |
|-------------|---------------------|
| I | 14 |
| II | 15 |
| III | 24 |
| IV | 29 |
| V | 18 |

In response to the question which asked Contact Points to rate the usefulness of GS-G-2.1, the following responses were received:

| Response | Total Votes | Percentage |
|-------------------|-------------|------------|
| Very Useful | 9 | 27% |
| Useful | 21 | 64% |
| Not very useful | 1 | 3% |
| Not useful at all | 0 | 0% |
| No response | 2 | 6% |

Member States were asked to list which topics they felt were the most useful within the current GS-G-2.1. The following specific topics were listed by multiple Member States:

- The Threat Categories in Chapter 2 and Appendix 1, while noting the need for increased consistency with GSR Part 7;
- The Area and Zone Sizes in Chapter 2 and Appendix 2, while noting the need for increased consistency with GSR Part 7;

- The Threat Assessment in Chapter 3, while noting the need for increased specificity on the methodology;
- The Functional Requirements in Chapter 4, while noting the need for increased consistency with GSR Part 7;
- The Emergency Classes for Emergencies at Facilities in Appendix IV; and
- The Response Time Objectives in Appendix 6.

Member States were also asked to list which topics they felt were the least useful within the current GS-G-2.1. The following specific topics were listed by multiple Member States:

- The Radiation Induced Health Effects in Chapter 2, with comments that this is covered in other documents;
- The General Requirements in Chapter 3, with comments that it is currently too high-level to be useful;
- The Concept of Operations in Chapter 6, noting that it could be useful with more specificity;
- The guidance for Threat Category V and transboundary emergencies; and
- Many MS noted that the topics related to facilities in Threat Category I and II, and also Threat Category V, were least useful because of the lack of these threats in their territory. This guidance covers many chapters and sections of GS-G-2.1 and reduces the overall usefulness of the document to these MS.

In response to the question which asked Contact Points whether the guidance in GS-G-2.1 sufficiently covers all potential emergencies in their country, the following responses were received:

| Response | Total Votes | Percentage |
|-------------|-------------|------------|
| Yes | 23 | 70% |
| No | 7 | 21% |
| No response | 3 | 9% |

In relation to the question above, the following emergencies were listed by Member States as not being sufficiently covered in GS-G-2.1 (singular responses are included):

- Emergencies on board Nuclear Power Vessels;
- Emergencies during decommissioning of nuclear power plants and nuclear fuel cycle facilities;
- Detailed guidance for facilities in emergency preparedness category III, such as hospitals and irradiation facilities;
- Emergencies initiated by a nuclear security event; and
- Emergencies during the transport of radioactive material (especially maritime).

In response to the question which asked Contact Points whether the structure of the document was good for their needs, the following responses were received:

| Response | Total Votes | Percentage |
|-----------------|-------------|------------|
| Very good | 6 | 18% |
| Good | 20 | 61% |
| Not very good | 5 | 15% |
| Not good at all | 0 | 0% |
| No response | 2 | 6% |

In response to the question which asked Contact Points whether they would like to see specific guidance for specific practices or specific aspects of EPR, the following responses were received:

| Response | Total Votes | Percentage |
|-------------|-------------|------------|
| Yes | 18 | 55% |
| No | 13 | 39% |
| No response | 2 | 6% |

In relation to the question above, the following topics for specific guidance were listed by multiple Member States:

- Hazard assessment methodology;

- Process for developing or refining protection strategy including intervention levels and the size of emergency planning zones and distances;
- International coordination for transboundary emergencies;
- Arrangements for preparedness and response to emergencies resulting from nuclear security events;
- Facilities and activities in emergency preparedness categories III and IV; and
- Emergency Management System.

The results above indicate that the guidance in GS-G-2.1 is useful to over 90% of respondents, but that a holistic revision is needed in order to ensure consistency with the revised safety requirements. A majority supported the creation of specific guidance for specific practices or aspects of EPR and a number of topics were identified for inclusion or added specificity.

APPENDIX 3

Discussions of the Working Group established under EPRESC

A working group (WG) under the Emergency Preparedness and Response Standards Committee (EPReSC) was established to review GS-G-2.1 and to discuss its future. The working group included representatives from the following Member States:

- Belarus;
- Canada;
- Egypt;
- France;
- Pakistan;
- Russian Federation;
- Serbia; and
- Slovenia.

The members of the WG were provided initially with a paper documenting the review contained in Appendix 1 of this DPP and later with the results from the analysis of Member States' feedback contained in Appendix 2 of this DPP. The initial paper and the review served as a basis for the Working Group members to provide their feedback on the following:

- What are the key areas that require revision?
- Should the revision be targeted to a limited number of specific areas or to the document as a whole?
- Should all the required guidance and recommendations be part of a single revised GS-G-2.1, inserted in other existing and upcoming Safety Guides, or be the subject of new Specific Safety Guides?
- Is there a need for Safety Guides in EPR that are specific to different emergency preparedness categories and, where necessary, to specific facilities, activities? Or are generic Safety Guides that can be scaled for various emergency preparedness categories sufficient.
- If so, what areas should remain in the revised GS-G-2.1 and what areas should be kept in separate Safety Guides?
- What are the priorities?

Working Group discussions were conducted via the collaborative workspace provided under the Emergency Preparedness Network (EPnet) and through email exchanges. The discussions were facilitated by an IEC staff.

Summary of the Working Group discussions

The Working Group agreed that GS-G-2.1 requires a holistic revision on a number of topics for consistency with GSR Part 7. Further, the Working Group agreed with the analysis deriving from the review of GS-G-2.1 and other EPR related safety standards against GSR Part 7 contained in Appendix 1 and Annex 1 of this DPP. With one exception, the Working Group agreed that GS-G-2.1 will need to be split into multiple safety guides covering specific aspects or emergency preparedness categories. The one exception noted that there is benefit in having a single reference document covering all aspects and emergency preparedness categories at a lower level than the requirements, but also noted that some topics must be covered in separate guides in more detail.

The Working Group identified the following topics as areas for updated guidance, although no specific recommendations are endorsed by the entire group:

- Emergency Management System;
- Emergency Planning Zones and Emergency Planning Distances;
- Managing Emergency Response Operations;
- Hazard Assessment;
- Infrastructure Requirements;
- Concept of Operations;
- Medical Response;
- Communicating with the Public; and

- Terminating an Emergency.

Considering guidance and recommendations which are already under development, and also considering topics which may be addressed by existing lower level guidance, the following topics were identified by multiple members of the Working Group as being a high priority for the revision of GS-G.2.1:

- Emergency Management System;
- Emergency Planning Zones and Emergency Planning Distances;
- Managing Emergency Response Operations;
- Hazard Assessment; and
- Infrastructure Requirements.

ANNEX 1

DETAILED ANALYSIS RESULTS

| GSR Part 7 | | GS-G-2.1 | GSG-2 | DS474 | DS475 | Other Safety Standards | Observations |
|-------------|------------------------------------|----------------------|-----------|-------|-------|------------------------|---|
| Requirement | Topic | | | | | | |
| 1 | Emergency Management System | General | / | / | / | / | <p>The topic is newly addressed in GSR part 7 and closely relates to national coordinating mechanism and quality management programme for which detailed guidance does not currently exist in any EPR related publication.</p> <p>Establishment of command and control system (or emergency response organization) for managing emergency response operation is discussed in EPR Series but not in any EPR related Safety Guide. This is discussed under Requirement 6 below.</p> |
| | | All hazards approach | Section 3 | / | / | / | / |

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| 2 | Roles and responsibilities in EPR | Government | Section 3 | / | Section 4 | / | / | <p>GS-G-2.1 discusses various roles and responsibilities in a generic manner. The role and responsibilities among various organizations in EPR will be very dependent on the national circumstances and will vary among different levels of authorities and for various postulated emergencies. Thus, detailed guidance on exactly who is responsible for what within a State is not possible. Rather more generic guidance can be given in this regard as it is done in GS-G-2.1 and EPR Series publications. Respective roles and responsibilities are also discussed in relation to various activities during the transition phase in the draft Safety guide DS474 (under development).</p> <p>Roles and responsibilities of the regulatory body are addressed in GSR Part 1 and guidance is provided in two Safety Guides under development (DS473, DS472) dedicated on the functions of the regulatory body, its organization, management system etc. GS-G-2.1 discusses generally roles and responsibilities in EPR of off-site authorities. Some of them are applicable for the regulatory body. Thus, this area may not warrant particular attention in GS-G-2.1 revision.</p> <p>GS-G-2.1 addresses briefly the concept of a national</p> |
| | | Regulatory body | / | / | / | / | GSR Part 1 DS472 DS473 | |
| | | Response organizations | Section 3 | / | / | / | / | |

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| | | Operating organization | Section 3 | / | / | / | SSG-8 SSG-11 RS-G-1.10 DS399 DS419 DS420 DS434 DS470 DS471 SSG-24 SSG-22 SSG-5 SSG-6 SSG-7 SSG-15 SSG-1 SSG-14 SSG-29 DS469 (TS-G-1.2) | <p>coordinating authority (NCA) rather than the new concept of a national coordinating mechanism (NCM) as introduced in GSR Part 7. This needs careful attention in any future revision of GS-G-2.1.</p> <p>Further guidance on respective responsibilities as defined in GSR Part 7 may be needed to be considered in any future revision of GS-G-2.1 to support the application of GSR Part 7. This is independent of the emergency preparedness category or of the facility/activity/sources that could be potentially involved in an emergency.</p> <p>Various safety guide publications (published or under development) address safety in general for specific facilities and activities (such as use of sources in research, education, medicine; industrial radiography; gamma, electron and X ray irradiation facilities; radioisotope production facilities; nuclear gauges; well logging; research reactors; disposal facilities; spent fuel storage facilities; fuel fabrication facilities; fuel reprocessing facilities; nuclear power plants; transport etc.). To some extent, these documents address on-site EPR as responsibility of the operating organization consistently with EPR related safety standards but the level of detail vary among them.</p> |
| | | Coordinating mechanism | Section 3 | / | / | / | / | |

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| 3 | Responsibilities of IOs | | Section 3 | / | / | / | / | <p>No need to go in many details in providing guidance at a Safety Guide level for international organizations, as this requirement is already implemented in the framework of IACRNE and its operational tool, the EPR Joint Radiation Emergency Management Plan of the International Organizations. The latter actually follows EPR related Safety Standards and other publications and takes into account the respective mandates of relevant international organizations. GS-G-2.1 actually makes reference to this mechanism in one paragraph of Section 3.</p> |
| 4 | Hazard Assessment | Postulating events | / | / | / | / | / | <p>Currently, there is no guidance in place to support GSR Part 7 application in terms of what events should be postulated as part of the hazard assessment process for identifying the range of postulated emergencies that warrant establishment of emergency arrangements. This aspect needs to be particularly addressed in any future revision of GS-G-2.1.</p> |
| | | Assessment of consequences | Sections 2 and 3 Appendices I, II, III | Appendix IV | Section 4 | / | / | <p>GS-G-2.1 provides guidance in terms of health hazards expected on-site and off-site in case of an emergency associated with specific facilities and activities, in accordance with their EP categorization. This includes discussion of areas to be impacted for a range of postulated emergencies (the emergency planning zones for general emergency in category I and II facilities and the cordoned off areas for radiological emergency (the latter being updated in GSG-2)). This is also addressed in EPR Series with the EPR NPP PPA 2013 publication providing further technical basis for determining the emergency planning zones as well as emergency planning distances consistently with GSR Part 7. DS474 puts this guidance also in perspective of providing basis for preparedness for the transition phase.</p> <p>The current guidance in GS-G-2.1 needs revision for</p> |

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| | | Graded approach (categorization) | Sections 2 and 3 Appendices I, II, III | / | Section 4 | / | / | consistency with updates introduced in GSR Part 7 to account also for areas that require further guidance such as: discussion on what events need to be postulated for specific facilities and activities; the extent of consequences to be assessed (both radiological and non-radiological); on-site - off-site interfaces in this regard; and how to derive radii of emergency planning zones and distances including the radii on cordoned off areas. This guidance will be dependent on emergency preparedness categories (i.e. to specific facilities/activities/sources that can be potentially involved in an emergency and postulated scenarios). |
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| 5 | Protection strategy | General (development, justification, optimization, implementation) | / | Section 3 | Section 4 | / | DS432 | <p>This is a new concept introduced initially in GSG-2 and thereafter, incorporated in GSR Part 7. EPR Protection Strategy document is under development to provide technical and practical guidance on development, justification, optimization of the protection strategy as well as on implementation. This can be considered for inclusion at a high level document later, i.e. in GSG-2 when to be revised. DS474 provides further guidance in this regard specific to the transition phase. Another Safety Guide DS432 (under development) provides general guidance on the concept of protection strategy, its justification and optimization for various exposure situations including the emergency exposure situation.</p> <p>The topic is in the scope of GSG-2 and may be dependent to some extent on various emergency preparedness categories (i.e. to specific facilities/activities/sources that can be potentially involved in an emergency and postulated scenarios).</p> |
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| | | Reference level | / | Section 3 | Section 4 | / | DS432 | <p>This is a new concept introduced initially in GSG-2 and thereafter, incorporated in GSR Part 7. EPR Protection Strategy document is under development to provide technical and practical guidance on the role of the reference level in EPR and how it is to be selected and implemented. This can be considered for inclusion at a high level document later, i.e. in GSG-2 when to be revised. DS474 provides further guidance in this regard specific to the transition phase. The draft Safety Guide DS432 discussed the concept of reference level in general in terms of existing and emergency exposure situation.</p> <p>The topic is in the scope of GSG-2 and the approaches to its selection and implementation can be to some extent dependent on various postulated emergencies.</p> |
| | | Generic criteria | / | Section 3 | Section 4 Appendix I | / | / | <p>The topic of generic criteria is addressed extensively in GSG-2. To be considered later for its update in light of GSR Part 7.</p> <p>The topic is in the scope of GSG-2.</p> |

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| | | Operational criteria | Section 4 | Section 5 Appendix II | Section 4 Appendix I | / | / | <p>The topic of operational criteria (OILs, EALs, observables) is addressed extensively in GSG-2. EPR-OILs document is under development¹ to provide technical basis and methodology for derivation of OILs taking into account updates introduced in GSR Part 7. To be considered later for its update (when GSG-2 to be revised) in light of GSR Part 7. The topic needs expansion in relation to EALs for various facilities and activities in particular.</p> <p>The topic is in the scope of GSG-2.</p> |
| 6 | Managing emergency response operations | Transition to emergency response | / | / | / | / | / | <p>The topic is not addressed at a Safety Guide level at all particularly in terms of provision of guidance for safe and secure transition from normal operations to emergency response operations and for unified command and control system. Limited guidance on the emergency response organization (incident command system) is provided in EPR Series (EPR Method 2003, in particular). The guidance may be dependent to some extent on the emergency preparedness category, i.e. on the facility/activity/source that could be potentially involved in an emergency and related postulated</p> |

¹ This document was published in 2017 ([INTERNATIONAL ATOMIC ENERGY AGENCY, Operational Intervention Levels for Reactor Emergencies, and Methodology for Their Derivation, EPR-NPP-OILs 2017, IAEA, Vienna \(2017\)](#)). Additional publication within EPR Series is under development to address OILs for radiological emergencies.

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| | | Command and control system | / | / | Section 4 | / | / | <p>scenarios. However, generic guidance for various structures in the emergency response organization that can be scaled on the basis of level of response needed is doable.</p> <p>This topic requires particular attention in any future revision of GS-G-2.1.</p> <p>The draft Safety Guide DS474 (under development) discusses and provides guidance on the changes in the management structure during the transition phase without going into details of the command and control system in place to manage the response operations during the emergency.</p> |
| 7 | Identifying, notifying, activating | Emergency classification | Section 4 Appendix IV | Section 5 Appendices III, IV | / | / | / | <p>Guidance is provided in the existing Safety Guides (GS-G-2.1 and GSG-2) in relation to the concept of emergency classification, emergency classes and EALs/observables. However, this practical guidance with example EALs does focus primarily to LWR emergencies and radiological emergencies that may happen at any location and it does not address fully various types of facilities and activities within all five emergency preparedness categories.</p> <p>The topic of notification and establishment of off-site notification points (their function, characteristics etc.) is not addressed with specific guidance in the existing Safety Guides.</p> |
| | | Notification | / | / | / | / | / | <p>These areas require attention in any future revision of GS-G-2.1.</p> <p>Guidance on activating an on-site and off-site emergency response is given in GS-G-2.1; however, it requires revision to</p> |

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| | | Activation | Section 4 Appendix VI | / | / | / | / | fully address GSR Part 7 updates. Response time objectives provide guidance on the expectations for activation of various components of the emergency response that can also be tested in national exercise regime. This guidance needs update in light of GSR Part 7. |
| 8 | Taking mitigatory actions | On-site mitigatory actions | / | / | / | / | DS483 SSG-8 SSG-11 RS-G-1.10 DS399 DS419 DS420 DS434 DS470 DS471 SSG-24 SSG-22 SSG-5 SSG-6 SSG-7 SSG-15 SSG-1 SSG-14 SSG-29 DS469 (TS-G-1.2) | No specific guidance and recommendations on this topic is provided in existing Safety Guide GS-G-2.1 and GSG-2. This requires attention in any future revision of GS-G-2.1. To some extent, this topic is addressed in EPR Series. However, other Safety Guides exist that are targeting specific facilities or activities and addressing some aspects of on-site mitigatory actions (listed in this Table) due to their specifics. However, the level of detail varies among them. |

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| | | Off-site emergency services | / | / | / | / | / | |
| 9 | Taking urgent response actions | Assessment of the situation | / | / | / | / | / | <p>The topic of continuous assessment of the situation throughout the emergency and sharing of information among respective organizations and the international community is currently not covered with specific guidance and recommendations in the existing Safety Guides (GS-G-2.1 and GSG-2). This requires attention in any future revision of GS-G-2.1. The guidance is not to be expected to be dependent largely on various postulated emergencies affecting various facilities/activities/sources.</p> |
| | | Sharing of information | / | / | / | / | / | |

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| | | On-site urgent protective actions | Section 4 Appendix V | Section 3 Appendix II | Section 4 | / | <p>SSG-8 SSG-11 RS-G-1.10 DS399 DS419 DS420 DS434 DS470 DS471 SSG-24 SSG-22 SSG-5 SSG-6 SSG-7 SSG-15 SSG-1 SSG-14 SSG-29 DS469 (TS-G-1.2)</p> | <p>Guidance and recommendations for taking urgent protective actions is given in GS-G-2.1 (general, on possible on-site and off-site protective actions and the mechanism for their implementation) and in GSG-2 (specific to criteria at which urgent protective actions need to be taken). However, focus to some extent on various on-site urgent protective actions may be useful in consideration of various types of postulated emergencies in any future revision of GS-G-2.1. The guidance on off-site urgent protective actions may be closely reviewed for consistency with the latest updates in GSR Part 7 in any future revision of GS-G-2.1.</p> <p>Safety Guide DS474 (under development) is providing guidance and recommendations for adapting and lifting urgent protective actions which will cover the existing gap in the EPR Safety Guides for such a guidance.</p> <p>Various safety guide publications (published or under development) address safety in general for specific facilities and activities (such as use of sources in research, education, medicine; industrial radiography; gamma, electron and X ray irradiation facilities; radioisotope production facilities; nuclear gauges; well logging; research reactors; disposal facilities; spent fuel storage facilities; fuel fabrication facilities; fuel reprocessing facilities; nuclear power plants; transport etc.). To some extent, these documents address on-site urgent protective actions as responsibility of the operating organization consistently with EPR related safety standards but the level of detail vary among them.</p> |
| | | Off-site urgent protective actions | Section 4 Appendices V, VII | Section 3 Appendix II | Section 4 | / | / | |

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| | | Emergency planning zones | Section 2 Appendix II Annex | / | / | / | / | Guidance including radii and limited basis for their derivation is provided in GS-G-2.1. This requires revision in the light of latest updates and criteria contained in GSR Part 7 to account for various facilities and activities and to further provide the basis for deriving the zone sizes. EPR Series publication (EPR NPP PPA 2013) provides an update in this regard but for LWRs only. |
| | | Emergency planning distances | / | / | / | / | / | This is a new concept introduced in GSR Part 7 and requires attention during any future revision of GS-G-2.1 for providing further guidance and recommendations including basis for deriving the radii for emergency planning areas for various facilities in EP categories I and II. EPR Series publication (EPR NPP PPA 2013) provides technical guidance in this regard but for LWRs only. |
| | | Inner cordoned off area | Section 2 Appendix II | Appendix IV | / | / | / | Guidance including criteria for deriving the radii of the cordoned off areas and proposed radii is provided in GS-G-2.1 and updated in GSG-2 for various postulated scenarios. This topic is also related to the Requirement 9 on taking urgent protective actions and other response actions. The extent of coverage in any future revision of GS-G-2.1 needs to be carefully considered in the light of GSR Part 7 and the guidance given in GSG-2. |
| 10 | Providing information, instruction and warning to the public in EPR | Information to the public in the emergency planning zones and distances at the preparedness stage | / | / | / | Section X | / | GS-G-2.1 does not provide guidance on these topics. However, along with Requirement 10 and, to some extent, Requirement 16, these topics fall within the scope of the Safety Guide DS475 which is under development. Moreover, practical guidance (EPR Public Communications 2012 and EPR Public Communication Plan 2015) currently exists that provides support to Member States how to apply most of the GSR Part 7 requirements in this area. |

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| | | Warning and instructing the public in the emergency planning zones and distances in an emergency | / | / | / | Section X | / | This area is out of the scope of GS-G-2.1 subject to full coverage in DS475. This aspect will be dependent on various postulated emergencies within the emergency preparedness categories when addressing potentially affected populations. |
| | | Warning and instructing the potentially or actually affected public in a radiological emergency | / | / | / | Section X | / | |
| | | Informing and advising the potentially or actually affected public abroad in case of transnational emergency | / | / | / | Section X | / | |
| 11 | Protecting emergency workers and helpers | Designation of emergency workers | / | / | Section 4 | / | DS453 | Protection of emergency workers in relation primarily to dose restrictions to be applied, medical attention to be provided and communicating doses received and associated risks to emergency workers is addressed in GSG-2. The Safety Guide DS453 on Occupational Radiation Protection, which is awaiting publication, addresses various aspects of occupational radiation protection in an emergency situation consistently with GSR Part 7 and provides further guidance on dose assessment, monitoring etc. |
| | | Helpers in an emergency | / | / | Section 4 | / | / | |
| | | Dose restrictions | / | Section 4 | Section 4 | / | DS453 | Comprehensive guidance of protecting emergency workers and helpers particularly during the transition phase is given in the Safety Guide DS474 under development. Although focus in |

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| | | Protective measures | / | / | Section 4 | / | DS453 | <p>DS474 is on the transition phase, the concepts are applicable for protection of emergency workers throughout the emergency. The guidance with specifics for earlier phases of an emergency can be looked closely later, i.e. in the revision of GSG-2 for example, to identify if there are any gaps.</p> <p>This topic is not an issue for consideration in any future revision of GS-G-2.1 in details except maybe in terms of qualification, staffing and training of emergency workers as discussed under infrastructural elements. This topic is not specific to facilities/activities/sources that could be potentially involved in an emergency and postulated scenarios although the extent of necessary arrangements will depend on the level of response needed.</p> |
| | | Dose assessment and monitoring | / | Section 4 | Section 4 | / | DS453 | |
| | | Provision of information | / | / | Section 4 | / | DS453 | |
| | | Medical examination | / | Section 3 Section 4 | Section 4 | / | DS453 | |
| 12 | Managing the medical response | Identifying clinical symptoms or other indications associated with an emergency | Section 4 | / | / | / | / | <p>This topic is addressed in Section 4 of GS-G-2.1 but not in many details in terms of specific guidance and recommendations. GSG-2 and the draft Safety Guide DS474 go in more details in relation to medical follow-up and longer term health monitoring.</p> <p>However, there is a need to address, in more details and at a Safety Guide level, the arrangements for: identifying clinical symptoms indicative to a radiation emergency and notification procedures; on-site medical response of specific facilities taking into account the specifics of the facilities that could be potentially involved in an emergency; and effective off-site medical response. These issues require careful attention in any future revision of GS-G-2.1.</p> |
| | | Off-site medical response (medical screening, triage, use of predesignated medical facilities) | Section 4 | / | / | / | / | |

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| | | On-site medical response (first aid, transport to predesignated medical facilities, initial medical treatment) | Section 4 | / | / | / | / | |
| | | Medical follow-up | Section 4 | Section 3 | Section 4 | / | / | |
| 13 | Communicating with the public | Communication strategy | / | / | / | Section X | / | <p>GS-G-2.1 addresses very limited recommendations regarding the communication with the public in its Section 4. This topic, along with Requirement 10 and, to some extent, Requirement 16, falls within the scope of the draft Safety Guide DS475 under development. Moreover, practical guidance currently exists (EPR Public Communications 2012 and EPR Public Communication Plan 2015) providing support to Member States how to apply most of the GSR Part 7 requirements in this area.</p> <p>Thus, this topic is out of the scope of GS-G-2.1. This topic is not specific to facilities/activities/sources that could be potentially involved in an emergency and postulated scenarios; rather generic guidance can be provided allowing scaling the guidance to the level of response needed.</p> |
| | | Coordination | Section 4 | / | / | Section X | / | |
| | | System for placing health hazards in perspective | Section 4 | / | / | Section X | / | |
| 14 | Taking early response actions | Emergency planning distances | / | / | / | / | / | See Requirement 9, line 'Emergency planning distances' above. |

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| | | Off-site early protective actions | Section 4 Appendices V, VII | Section 3 Appendix II | Section 4 | / | / | <p>The concept of early protective actions is introduced in GSR Part 7. It relates to the concept of agricultural countermeasures, countermeasures against ingestion and longer term protective actions used in earlier EPR Safety Standards. Guidance and recommendations for taking some early protective actions is given in GS-G-2.1 (general, on possible early actions and the mechanism for their implementation without referring to them as early protective actions) and in GSG-2 (specific to criteria at which early protective actions and other response actions need to be taken).</p> <p>The guidance on early protective actions in GS-G-2.1 needs to be carefully reviewed for consistency with the latest updates in GSR Part 7. This topic is not specific to facilities/activities/sources that could be potentially involved in an emergency and postulated scenarios; rather generic guidance can be provided allowing scaling the guidance to the level of response needed.</p> <p>Safety Guide DS474 (under development) is providing guidance and recommendations for adapting and lifting early protective actions which will cover the existing gap in EPR Safety Standards in this regard.</p> |
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| | | Monitoring strategy | / | / | Section 4 | / | RS-G-1.8 | <p>Existing EPR Safety Guides (GS-G-2.1 and GSG-2) do not provide guidance on monitoring in an emergency. However, RS-G-1.8 provides extensive guidance on environmental and source monitoring in an emergency, including priorities for various phases, considerations for dose assessment and interpretation of monitoring results. This is still valid guidance and its update in the light of GSR Part 7 should be foreseen in the near future.</p> <p>Guidance and recommendations on the monitoring strategy during the transition phase in order to characterize the exposure situation is provided in the draft Safety Guide DS474 (under development).</p> <p>This topic may remain in the scope of RS-G-1.8 primarily subject to full involvement of EPR experts and EPRReSC and it may not warrant attention during any future revision of GS-G-2.1. This topic is not specific to facilities/activities/sources that could be potentially involved in an emergency and postulated scenarios; rather generic guidance can be provided allowing to scale the guidance to the level of response needed.</p> |
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| | | Retrospective assessment of exposures | / | / | / | / | RS-G-1.8 | Limited guidance on dose assessment in an emergency is given in RS-G-1.8. However, no guidance is given in EPR related Safety Standards. This topic may warrant some attention during any future revision of GS-G-2.1 for potential coverage. This topic is not specific to facilities/activities/sources that could be potentially involved in an emergency and postulated scenarios. |
| 15 | Radioactive waste management | General (emergency preparedness for safe and effective waste management after an emergency) | / | / | Section 4 | / | / | <p>The draft Safety Guide DS474 under development provides further guidance on safe and effective management of waste following a nuclear or radiological emergency. Disposal of waste generated after an emergency goes beyond the scope of the EPR related safety standards and it is addressed in the Specific Safety Standards Series. The topic is addressed, in more details, in a TECDOC under development on management of large amount of waste after a nuclear or radiological emergency (ready for publishing) developed by NSRW in cooperation with IEC and consistently with DS474.</p> <p>The topic is in the scope of DS474 and thus, may not warrant attention during any future revision of GS-G-2.1. Further guidance provided in waste management related safety standards (listed in this Table) remains applicable irrespective of the origin of the waste.</p> |
| | | Pre-disposal management | / | / | Section 4 | / | GSR Part 5 SSR-5 GSG-1 WS-G-6.1 GSG-3 DS447 ² DS448 ³ DS477DS4 54 GS-G-3.3 | |

² Published as IAEA Safety Standards Series number SSG-41 in August 2016.

³ Published as IAEA Safety Standards Series number SSG-40 in August 2016.

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| | | Disposal | / | / | Section 4 | / | SSR-5 GSG-1 SSG-23 GS-G-3.4 | |
| | | Management of human and animal remains | / | / | Section 4 | / | / | |
| 16 | Mitigating non-radiological consequences | | Section 4 | Section 3 Section 4 | / | / | / | <p>This topic has only been mentioned in GS-G-2.1 without actual guidance and recommendations. As it closely relates to communication with the public, to some extent guidance on how to mitigate such consequences will be given in the Safety Guide DS475 (under development).</p> <p>Consideration of various non-radiological aspects during the transition phase is extensively addressed in the Safety Guide DS474 (under development) including the provision of mental health and psychosocial support to affected populations.</p> <p>Still various aspects may remain in the scope of any future revision of GS-G-2.1 particularly for the early phase of an emergency. An example of such an aspect can be the provision of advice and information to combat unwarranted actions (unless covered in DS475). To great extent such guidance is not specific to facilities/activities/sources that could be potentially involved in an emergency and postulated scenarios; any generic guidance should be adequate and appropriate to be scaled according to the level of response needed.</p> |
| 17 | International assistance | General | / | / | / | / | / | <p>This concept is addressed at a safety requirements level in GSR Part 7 for the first time. Section 3 of GS-G-2.1 very briefly discusses the arrangements under the Assistance Convention only-. Operational tools under the Assistance Convention exist (EPR RANET 2013) and guidelines are under development on</p> |

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| | | Bilateral and multilateral mechanisms/instruments | Section 3 | / | / | / | / | the response and assistance products (EPR Response and Assistance Products). However, this area may warrant some attention in any future revision of GS-G-2.1 in order to provide guidance (at a Safety Guide level) to Member States on how to meet Requirement 17 of GSR Part 7. |
| | | Compatibility | / | / | / | / | / | |
| 18 | Termination of an emergency | Conditions, criteria and objectives to be met | / | / | Section 3 | / | / | This concept supersedes the concept of transitioning from emergency response operations to long term recovery operations contained in the earlier edition of EPR Safety Requirements. Except for addressing protection of emergency workers in general (without clarifying the challenges and arrangements to be made for protecting them during later phases of the emergency as well as how they are to be protected once the emergency is to be terminated), this topic does not have any guidance (either in terms of recommendation or in terms of practical guidelines). The Safety Guide DS474 under development addresses this topic in details. The topic is out of the scope of GS-G-2.1. |
| | | Protection strategy | / | / | Section 4 Annex II | / | / | |
| | | Adjusting and lifting protective actions and other response action | / | / | Section 4 Appendix I | / | / | |
| | | Communication and consultation with the public and other interested parties | / | / | Section 4 | Section X | | |
| | | Responsibilities and their transfer | / | / | Section 4 | / | / | |
| | | Characterization of situation | / | / | Section 4 | / | | |

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| | | Review of the hazard assessment and emergency arrangements | / | / | Section 4 | / | / | |
| | | Coordination and transfer of information | / | / | Section 4 | / | / | |
| | | Workers and helpers protection | / | Section 3 | Section 4 | / | DS453 | |
| 19 | Analysis of the emergency and emergency response | General | / | / | / | / | / | This is a new concept introduced as functional requirement in GSR Part 7. It requires further guidance to support its application and thus, may need to be closely looked at in any future revision of GS-G-2.1. To some extent, some practical guidance may be found on investigating emergencies and learning lessons in EPR Method 2003. This area is not specific to facilities/activities/sources that could be potentially involved in an emergency and postulated scenarios. |
| | | Protecting and preserving data and information in an emergency response | / | / | / | / | / | |
| | | Follow-up actions and sharing of information | / | / | / | / | / | |
| 20 | Authorities | | Section 5 | / | Section 4 | / | / | Infrastructural elements are very briefly discussed in Section 5 of GS-G-2.1. However, no guidance and recommendations are given on most of these elements to facilitate implementation of GSR Part 7 requirements except in relation to Emergency response facilities and locations (Appendix VIII). Within EPR Series, a similar approach to infrastructural elements is followed in EPR Method 2003 too, although very practical guidance can be found for example on various plan templates. The other area addressed comprehensively within EPR series is preparation, conduct and evaluation of exercises. Still, these |
| 21 | Organization and staffing | | Section 5 | / | Section 4 | / | / | |

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| 22 | Coordination | | Section 5 | / | Section 4 | / | / | <p>areas require guidance at a Safety Guide level. Thus, GS-G-2.1 which addresses arrangements for the preparedness for an emergency in its revision may need to pay particular attention to providing guidance and recommendations to areas which are currently not covered in any guidance, particularly infrastructural elements as following:</p> <ul style="list-style-type: none"> - Assignment of authorities per function; - Organizations (on-site and off-site), identification of various positions in the organization including their roles and responsibilities in EPR and staffing recommendations; - Guidance for development of plans and procedures at various levels including templates of them and for their evaluation; - Guidance on qualifications for various positions in emergency response organization as well as on training programmes for various emergency workers, the frequency of training, its evaluation etc.; - Guidance of exercise regime and exercise programme, its objectives, frequencies, evaluation, and observation; - Quality management in EPR (relates also to Requirement 1 of GSR Part 7). |
| 23 | Plans and procedures | | Section 5 | / | Section 4 | / | / | |
| 24 | Logistical support and facilities | | Section 5 Appendix VIII | / | Section 4 | / | / | |
| 25 | Training, drills and exercises | | Section 5 | / | Section 4 | / | / | |
| 26 | QM programme | | Section 5 | / | Section 4 | / | GSR Part 2 GS-G-3.1 | |

ANNEX 2

QUESTIONNAIRE TO GATHER FEEDBACK ON GS-G-2.1

2 GS-G-2.1 evaluation

2.1 Do you find GS-G-2.1 useful?

- Very useful
- Useful
- Not very useful
- Not useful at all

2.1.1 What parts are MOST useful, and why?

2.1.2 What parts are LEAST useful, and why?

2.2 What guidance from GS-G-2.1 did your country implement?

2.3 What guidance from GS-G-2.1, if any, did you not implement because you find it too difficult to follow?

2.4 What feedback do you have from the implementation of GS-G-2.1 in your country?

2.5 Does the guidance provided in GS-G-2.1 sufficiently cover all potential emergencies in your country?

- Yes
- No

2.5.1 If no, what is missing?

2.6 Are there guidance areas that are missing and that you would like to see in the revision?

- Yes
- No

2.6.1 If yes, which ones?

2.7 Do you find the document structure good for your needs?

- Very good
- Good
- Not very good
- Not good at all

2.8 If you could change anything in GS-G-2.1, what would be the most important change?

2.9 Any other suggestion that could improve GS-G-2.1?

2.10 Would you like to see specific guidance for specific practices or specific aspects of EPR?

- Yes
- No

2.10.1 If yes, which ones?