DS505 "Radiological Monitoring for Protection of the Public and the Environment"
(revision of RS-G-1.8)
(Version dated 28-07-2023)
Status: STEP 7

COMMENTS BY REVIEWER				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection or notes
1	Title	General Comment The title in the CSS approved DPP differs from the title in this draft. A full justification for the change should be provided.	"Source Monitoring, Environmental Monitoring and Individual Monitoring for Protection of the Public and the Environment" by approved DPP https://www.iaea.org/sites/default/files/dpp505.pdf "Radiological Monitoring for Protection of the Public and the Environment" by draft (Step 7) https://www-ns.iaea.org/committees/files/draftcomments/2303/DS505RadiologicalMonitoringforProtectionofthePublicandtheEnvironment-Step7.pdf			X	The title was changed for conciseness and clarity, following a suggestion of the IAEA Safety Standards Specialist.

2	Title	"~~**Radiological**~~ Monitoring for Protection of the Public and the Environment" or "~~Radiological~~ Radiation Monitoring for Protection of the Public and the Environment"	Considering the definition of the term "monitoring" in IAEA Safety and Security Glossary: "**The measurement of dose, dose rate or activity for reasons relating to the assessment or control of exposure to radiation or exposure due to radioactive substances, and the interpretation of the results.**" , when using this term it is clear, we are talking about radiation. The term "radiological monitoring" is not common. Also, in the draft mostly "monitoring" is used. In GSR Part 3 and GSR Part 7, only the term "monitoring" has been used.			X	To be consistent with the terminology used in complementary safety guides, particularly GSG 10 Prospective *Radiological* Environmental Impact Assessment for Facilities and Activities. We will discuss though with the IAEA Safety Standards language specialist.
3	Title	The title of this Safety Guide should be changed to "Source Monitoring, Environmental Monitoring and Individual Monitoring for Protection of the Public and the Environment" in light of DPP.	Regarding current title of this Safety Guide, the scope seems not obvious. See Comment No.2.			X	The title was changed for conciseness and clarity, following a suggestion of the IAEA Safety Standards Specialist.
4	General comment	It does not seem to be the usual practice to quote requirements as first paragraphs of chapters in a safety guide. Please ensure consistency with the usual/agreed practice.				X	The practice varies between Safety Guides. However, this will be discussed with the Safety Standard Specialists during further review.

5	General comment	The scope of the document is facilities that emit effluents in normal operation or have the probability to release radioactive material in case of an accident. These facilities will always be regulated by a license and not by registration. All text which refers to registered facilities or activities have to be deleted as they are not relevant.				X	According to GSR Part 3, “typical practices that are suitable for registration are those for which: (i) safety can largely be ensured by the design of the facilities and equipment; (ii) the operating procedures are simple to follow; (iii) the training requirements for safety are minimal; and (iv) there is a history of few problems relating to safety in operations.” Registered practices can generate discharges and monitoring for registered practices might be required by regulatory bodies (see also Table 1). Moreover, the explanation provided from para 5.2 to para 5.6 can be useful for a broader audience of users of the document.

6	General comment	Insert "nuclear" before referring to "safety" which should be needed in some cases.	terms of the IAEA		X		In the context of the IAEA safety standards, the words ‘safety’ and ‘nuclear safety’ are interchangeable according to the IAEA Nuclear Safety and Security Glossary, 2022. A footnote was added with this information in Section 2.
7	General	The explanation of the scope addressed by this document is confusing. For example, it is not clearly stated that monitoring of buildings, land, etc. for decontamination activities carried out during the transition from the emergency exposure situation to the existing exposure situation is not covered. Is it possible to give an overall picture (table or figure) of monitoring addressing in this document?	Clarification.		X		A number of amendments were included to make the scope more straightforward. The inclusion of a summary table for the scope will be evaluated to be included after receiving Member States’ comments. Specifically related to the transition phase monitoring, the requirements in GSR part 3 apply to the transition phase, so it is implied that this safety guide covers monitoring for the protection of the public during the transition phase (see also para 6.10).

8	Contents	Title of the section 3 “CONCEPTS AND TERMS relevant for monitoring” may be changed to “CONCEPTS AND TERMS RELEVANT FOR MONITORING	Editorial. Uniform capital font need to be used in the title.	X			
9	CONTENTS	Section 8 (Design and Implementation of a Monitoring Programme) should be moved to a place after Section 4 (Responsibilities for Monitoring) and before Section 5 (Monitoring in a Planned Exposure Situation).	To improve readability.			X	The Secretariat considers preferable that the different characteristics of the three exposures situations (Sections 5,6, and 7) are presented before the discussions on the design and implementation (Section 8), which have a lot of commonalities applicable to the three situations.

10	p.1	The following is suggested. 1. Introduction 2. Overview of monitoring - Safety objectives 3. Responsibilities and requirements relevant to monitoring 4. Concepts and Terms relevant to monitoring 5. Key considerations for monitoring programme - Planned Exposure situations - Emergency Exposure situations - Existing Exposure situations 6. Design and Implementation of a monitoring programme 7. Data management, analysis, interpretation and reporting of monitoring results 8. References	With regard to the contents, it should be consisted of comprehensive and key words to show the report in advance. In this aspect, it is recommended that a table of contents be changed.			X	The structure of the safety guide is mainly in-line with your proposal other than reversing Sections 3 and 4. As described in "Structure", page 5, Section 2 sets out the IAEA safety requirements relevant for monitoring for which guidance is provided in the document. These requirements should be set first and in line with all IAEA Safety Guides. The concepts described in section 3 are relevant for understanding the responsibilities described in section 4. We consider that the three different types of exposure situation should be separated in different chapter, following a similar logic of the GSR Part 3.

11	1.1/ First paragraph/ Lines 1 and 7	"~~Radiological m~~Monitoring programmes…" "…that may be involved in such ~~radiological~~ monitoring …"	Please consider comment no.1, also, paragraph 3.127 of GSR Part 3.			X	We use "Radiological monitoring" in the first line of the safety guide, to be consistent with the title (see comment above). Afterward just "monitoring' is used for brevity We consider that it in the first sentence is important to specify "radiological", as it gives the context of the safety guide. Nevertheless, this will be discussed with the IAEA Safety Standards language specialist.
12	1.2/3 (p.1), 1.5/3-4 (p.2), 1.10/3 (p.3)	Regarding individual monitoring of public, these three paragraphs describe in different way. ·Para. 1.2: "in very specific cases," ·Para. 1.5: "In some cases," ·Para. 1.10: "where applicable," The description of them would be appropriate to amend for alignment of nuance. For example, using a phrase "as necessary."	Clarification.		X "In very specific cases" was replaced by "as necessary' in Para 1:20.		Para 1.2 was modified; the others were kept as it is a matter of style.

13	1.2	Monitoring for protection of the public and the environment includes monitoring at the source (source monitoring), monitoring in the environment (environmental monitoring) and, in very specific cases, ~~individual~~ monitoring of members of the public (individual monitoring), see also paras 3.11 – 3.13.	Clarification. Please add a reference to paras 3.11 – 3.13, as the three types of monitoring are defined/explained there.	X			
14	Para 1.4	The regulatory body may establish requirements for monitoring the impact of discharges **commensurate with the radiation risks** and using a graded approach	Regulatory requirements are mainly based on the radiation risks.		X The regulatory body may establish requirements for monitoring the impact of discharges using a graded approach, **commensurate with the radiation risk.**		
15	1.4 last line	…IAEA Safety Standards Series No. GSG-8 [~~GSG-8~~ 4].	The reference to GSG-8 should be included as reference [4] in the text and accordingly also included in the "References".	X			
16	1.4 Line 5	… Recommendations on including a graded approach within the licensing process are provided in IAEA Safety Standards Series No. GSG-8, Radiation Protection of the Public and the Environment [~~GSG-8~~X].	Please put a proper reference number here and add the title of GSG-8.	X			
17	1.5 line 4	… for the assessment and implementation of actions for protection of ~~persons~~ the public and the environment.	Clarification: Throughout the text, it usually says "protection of the public and the environment." What is meant by protection of "persons" in this sentence? If it means the public and workers, it should be written that way.	X			

18	1.5 line 7/8	In some cases, individual monitoring of members of the public may be appropriate.	Wording, see also Para 1.10	X			
19	1.5/First line	"…Despite measures to prevent accidents and ~~minimize~~ to mitigate ~~the~~ harmful consequences…"	Considering GSR Part 7, the common term for "minimize" is "mitigate". Please replace "minimize" with "mitigate".	X			
20	1.5	Remove the sentences: "The requirements for radiation monitoring in emergency exposure situations are established in IAEA Safety Standards Series No. GSR Part 7, Preparedness and Response for a Nuclear or Radiological Emergency [5]. In some cases, individual monitoring of the public may be appropriate."	GSR Part 7 does not include requirements for monitoring as such. There are requirements for timely monitoring and the use of operational criteria (5.40); monitoring aligned with the protection strategy (5.82), and others. However as it is, the statement is not accurate, it can be misleading and it does not add guide to the paragraph.			X	There are a number of requirements in GSR Part 7 in which monitoring in the event of an emergency is stated. For example: Requirements 7 (para 5.14 b), 9 (para 5.38 iii) ,14 (para 5.76, 5.81), 16, 18, 24 and 26.
21	1.6	In areas contaminated with long lived radionuclides from past activities that were not subject to appropriate control, or as a result of a nuclear or radiological accident after the emergency has been declared to be ended, monitoring may be needed to aid decisions on the protection of the public and the environment, including for implementing practical measures to reduce the exposures to the population , including remediation activities, where justified.	Clarification.	X			
22	1.6/Second line	"…or as a result of a nuclear or radiological ~~accident~~ emergency after ~~–~~its termination ~~the emergency~~ has been declared ~~to be ended~~."	The initiator of a nuclear or radiological emergency may be a safety or security event. By using the term "accident", the emergency is limited to the events with safety causes. It is suggested to make the sentence more general.	X			

23	1.6/ Last line	"…including ~~remediation activities~~ remedial actions, where justified."	According to GSR Part 7.The definition of "remedial actions" is included in IAEA Safety and Security Glossary.	X			

24	1.7	1.7. Although the IAEA safety standards contain general provisions for the protection of the environment from the harmful effects of radiation, GSR Part 3 [1] does not have specific requirements for the explicit assessment of the exposure (and hence the level of protection) of flora and fauna. Nevertheless, GSR Part 3 [1] identifies the protection of the environment as an issue usually necessitating assessment, while allowing for flexibility in incorporating into decision making processes the results of environmental assessments that are commensurate with the radiation risks. The usual environmental monitoring programmes for the protection of the public, as described in this Safety Guide, are generally sufficient to validate the assessment of the level of protection of the populations of other species.	Consistency with GSR Part 3. Para. 1.33 of GSR part 3 1.33. The system of protection and safety required by these Standards generally provides for appropriate protection of the environment from harmful effects of radiation. Nevertheless, international trends in this field show an increasing awareness of the vulnerability of the environment. Trends also indicate the need to be able to demonstrate (rather than to assume) that the environment is being protected against effects of industrial pollutants, including radionuclides, in a wider range of environmental situations, irrespective of any human connection. This is usually accomplished by means of a prospective environmental assessment to identify impacts on the environment, to define the appropriate criteria for protection of the environment, to assess the impacts and to compare the expected results of the available options for protection. Methods and criteria for such assessments are being developed and will continue to evolve.	X			

25	Para 1.7 and 1.19		The content of the paragraphs is similar, it is proposed to combine them. In addition, the paragraphs indicate that the safety guide does not address issues related to monitoring of flora and fauna, however, further in the text of the guide, these issues are discussed (for example, paragraph 3.4, Table A-1).		X		Paragraph 1.7 is part of the background, while paragraph 1.19 is part of the scope. We consider that it is important to mention the topic in both background and scope. The safety guide does not provide guidance on the situations in which a specific monitoring programme for the protection of flora is required. A number of amendments were made to the text for clarification.
26	1.8A	The terms used in this Safety Guide are to be understood as defined and explained in the IAEA Nuclear Safety and Security Glossary [4].	Please add a new para. Additionally, please check if Reference [4] is relevant for Glossary, as this is not clear from the text (we mean in footnote 1, in para. 3.2, in para. 3.10 etc).		X		The sentence was included as part of an introductory paragraph in section 3.

27	Title and para 1.10	This Safety Guide provides recommendations for **organizations responsible for developing and implementing monitoring strategies and programmes as well as for** governments, regulatory bodies, and other relevant authorities responsible for developing the legal and regulatory frameworks for source and environmental monitoring and, where applicable, individual monitoring of the public. ~~This Safety Guide also provides recommendations for those responsible for developing and implementing monitoring strategies and programmes.~~	If the Safety Guide provides recommendations for governments, regulatory bodies and other relevant authorities as stated in para 1.10 it should be apparent from the title of the Guide or para 1.10 should be reworded.			X	The title of the Safety Guide is general as it covers many aspects related to the safety requirements and other safety guides. As for the suggestion of moving the last sentence to the beginning, we consider legal and regulatory frameworks should be in place to implement the strategies and programmes, so legal and regulatory framework should be first mentioned.
28	Para 1.11	This Safety Guide provides recommendations on confirmatory monitoring programmes conducted by the regulatory body (or by other organizations on their behalf) in relation to the operation **and decommissioning** of facilities and the conduct of activities and where a responsible operating organization cannot be identified.	It is recommended to supplement this paragraph with recommendations for monitoring during decommissioning of installations. Similar recommendation for paragraphs 5.7, Table A-2.	X			The Annex is applicable to the operational stages, the title was changed for clarification.

29	1.13	The scope lists “all exposure situations,” yet it doesn’t appear that direct radiation exposure of members of the public is discussed in much detail in this document (para 5.29 and 5.30 are exceptions) . Direct radiation exposure can become a non-negligible source of exposure if a facility is storing spent fuel in an above-ground interim storage facility on site. Either this mechanism of exposure should be discussed in the document (e.g., in para 5.7), or it should be listed as outside the scope of the document as in para 1.20-1.25			X		A sentence was included in para 5.21, and para 5.22 to address direct radiation from the source. Para 5.24 was also amended.

30	Scope	(be added to scope:) "This safety guide doesn't address (/addresses) the protection of the people and the environment against NORM"	It is not clear whether this document covers the NORM or not.	X	New paragraph added in the Scope: [new] "This Safety Guide applies to the nuclear fuel cycle facilities, including mining and processing activities. This Safety Guide does not cover monitoring in other industries that process materials with elevated concentrations of natural radioactivity, including mining and milling of metalliferous and non-metallic ores, production of coal, oil and gas, extraction and purification of water, generation of geothermal energy, and production of industrial minerals, including phosphate, clay and building materials. However, technical aspects of this safety guide may be helpful for radiological monitoring in such industries."		

31	1.16	General aspects of monitoring performed in response to a nuclear or radiological emergency are also considered in this Safety Guide. More detailed ~~recommendations~~ guidance on monitoring during a nuclear or radiological emergency are provided in IAEA Safety Standards Series Nos GS-G-2.1, Arrangements for Preparedness for a Nuclear or Radiological Emergency [13], GSG-11, Arrangements for the Termination of a Nuclear or Radiological Emergency [14], and SSG-65, Preparedness and Response for a Nuclear or Radiological Emergency Involving the Transport of Radioactive Material [15]. This Safety Guide only addresses the source and environmental monitoring for facilities and activities in emergency situations where an off-site release has occurred or is foreseen to occur.	The referred guidance does not provide recommendations but guidance.	X			
32	1.18	This Safety Guide considers the analysis of the content of radionuclides in food and drinking water only where they are considered environmental matrices (see para.3.1) relevant to public exposures, as part of environmental monitoring programmes.	Term “environmental matrices” is used here for the first time, and first explained in para.3.1. We suggest to refer to para.3.1 to make the text more reader-friendly.	X			

33	1.19	1.19. Monitoring related to assessment of exposures to flora and fauna is not addressed in this Safety Guide. This assessment can be done, if deemed necessary, using a generic methodology ~~reference approach~~ as described in Annex I of ~~ICRP Publication 108 [19] and in~~ Ref. [2]. The monitoring programmes for members of the public would be sufficient to validate the generic assessment for flora and fauna. For very specific cases, for example when dealing with endangered species or in protected areas, the government or the regulatory body could decide whether specific monitoring for a particular flora or fauna would be necessary.	Consistency with GSR Part 3 and GSG-10.		X The text was modified as follows: "Monitoring related **specifically** to assessment of exposures to flora and fauna is not addressed in this Safety Guide. **If deemed necessary,** a generic **methodology as described** in Annex I of Ref. [2] can be used for assessing exposures to flora and fauna [footnote]. The monitoring programmes for members of the public would **generally** be sufficient to validate the generic assessment for flora and fauna. For ~~very~~ specific cases, for example when dealing with endangered species or in protected areas, the government or the regulatory body could decide whether specific monitoring for a particular flora or fauna would be necessary." Footnote: The IAEA generic methodology is based on a reference approach for protection of the environment as described in ICRP 108 [19]		

34	1.19	Line 5 mentions: *"The monitoring programmes for members of the public would be sufficient to validate the generic assessment for flora and fauna"* This needs to be explained. Methods to assess risks for flora and fauna are completely different from those for the members of the public			X The text was modified as follows: "Monitoring related **specifically** to assessment of exposures to flora and fauna is not addressed in this Safety Guide. **If deemed necessary,** a generic **methodology as described** in Annex I of Ref. [2] can be used for assessing exposures to flora and fauna [footnote]. The monitoring programmes for members of the public would **generally** be sufficient to validate the generic assessment for flora and fauna. For ~~very~~ specific cases, for example when dealing with endangered species or in protected areas, the government or the regulatory body could decide whether specific monitoring for a particular flora or fauna would be necessary." Footnote: The IAEA generic methodology is based on a reference approach for protection of the environment as described in ICRP 108 [19]		Despite methods have a lot of commonalities (e.g., they use estimations of activity concentration in environmental media leading to exposures both to humans and to flora and fauna), the paragraph does not state that the methods to assess risk for flora and fauna are exactly the same as those used for humans; it says that the monitoring programmes designed for members of the public generally are sufficient to validate the assessment for flora and fauna. Modifications were included for clarification.

35	1.19	Monitoring related to assessment of exposures to flora and fauna is not addressed in this Safety Guide. This assessment can be done using a generic reference approach as described in ICRP Publication 108 [19] and in Ref. [2]. The monitoring programmes for members of the public would be sufficient to validate the generic assessment for flora and fauna. ~~For very specific cases, for example when dealing with endangered species or in protected areas, the government or the regulatory body could decide whether specific monitoring for a particular flora or fauna would be necessary.~~	The notion of « sensitive biota » should be precised. Does the term correspond to the notion of endangered species as mentioned in para. 1.19 ? If yes, this seems problematic with regard to 2 aspects: ○ This is not consistent with the European ERICA approach, based on organisms that are representative of the ecosystems in which they are living (and which therefore covers all specific species); ○ This creates an additional pressure/constraint on species that are already threatened, and this could ultimately be detrimental to the balance of the ecosystem and biodiversity.		X Text and tables in the Annex were amended to be consistent with paragraph 1.19. Modifications were made in paragraph 1.19 as well.		

36	1.19	1.19. Monitoring related to assessment of exposures to flora and fauna is not addressed in this Safety Guide. This assessment can be done using a generic reference approach as described in ICRP Publication 108 [19] and in Ref. [2]. The monitoring programmes for members of the public would generally be sufficient to validate the generic assessment for flora and fauna. For ~~very~~ specific cases, for example when dealing with endangered species or in protected areas, the government or the regulatory body could decide whether specific monitoring for a particular flora or fauna would be necessary.	For consistency with environmental safety guides GSG-8 and GSG-10, which do not explicitly assume that if people are protected the environment is protected. This change would also be consistent with the words used in paragraph 1.7 of this version of DS505. In particular, see Sections 4.3 & 4.4 of GSG-10. Some further reference to assessment (GSG-10) and GSG-8 could also be considered.	X			
37	1.21 line 3	… IAEA Safety Standards Series No. TS-G-1.3 SSG-86, …	TS-G-1.3 has been revised and is available as preprint SSG-86. Please also check the "References" accordingly.	X			
38	1.21	This Safety Guide does not provide recommendations on monitoring for the purpose of assessing exposures from the transport of radioactive material and exposures: this is addressed in IAEA Safety Standards Series No. ~~TS-G-1.3~~ DS521, Radiation Protection Programmes for the Transport of Radioactive Material [22].	TS-G-1.3 is also under review, now DS521 in Step12 – similar to para. 1.15, where DS529 is indicated. We suggest to use the same format.		X		Reference was changed to SSG-86 (DS521) which is currently in the preprint repository.

39	1.21	This Safety Guide does not provide recommendations on monitoring for the purpose of assessing exposures from the transport of radioactive material ~~and exposures~~: this is addressed in IAEA Safety Standards Series No. TS-G-1.3, Radiation Protection Programmes for the Transport of Radioactive Material [22]	This is surplus here. The later reference referred to TS-G-1.3 deals with the exposures from transport, so there shouldn't be other exposures mentioned here.	X			
40	1.21 line 2	…for the purpose of assessing exposures from the transport of radioactive material ~~and exposures~~:	Duplication of "exposure" in the sentence.	X			
41	1.25/2 (p.5)	Add examples of "physical stressors" so that the readers could easily understand why physical properties should be considered.	For easier understanding by the readers.	X			
42	Page no 7, Title	The title of the section 2 "SAFETY OBJECTIVES AND REQUIREMENTS RELEVANT TO MONITORING" may be changed to "SAFETY OBJECTIVES AND REQUIREMENTS RELEVANT TO **RADIOLOGICAL** MONITORING	In line with the title of the safety guide.	X			

43	2.	Determine the general steps within the regulatory frameworks for safety and environmental control procedures, along with drawing the structure of the physical protection strategy within the infrastructure of the nuclear facility.	Because it includes : 1) IAEA Safety Standards Series No. GSR Part 1 (Rev. 1 GSR Part 3 [1] establishes 2) Requirements relevant to the various interested parties radiation monitoring in emergency exposure situations are established in GSR Part 7 [5]. 3) control the radiation exposure of people and the release of radioactive material to the environment			X	The proposed modifications are related to security. As stated in paragraph 1.24, Scope, monitoring for nuclear security purposes (physical protection) is out of the scope of this Safety Guide. Moreover, Section 2 is intended to present the requirements in GSR Part 3 and GSR Part 7 important for monitoring for the protection of the public and the environment.
44	Page no 7, Para 2.4, line no 11	Requirements for monitoring in relation to all stages of the life cycle of fuel cycle **facilities** are established in IAEA Standards Series No. SSR-4 Safety of Nuclear Fuel Cycle Facilities	Editorial The word “facilites” may be corrected to “facilities”	X			
45	2.5/1 and 2.9/1 (p.8)	Format of citation of Requirement should be aligned as follows. Paragraph ## of GSR Part 3 [1] states that:	Editorial. Consistency with other paras.	X			

46	2.6/Page 12	There is no need to put this paragraph here.				X	The requirement in GSR Part 1 (rev 1) is related to the need to consider in the national infrastructure provisions for the involvement of interested parties. As the communication of monitoring results is relevant for and is discussed in this Safety Guide we consider that it should be kept.
47	2.7 line 3	"emergency exposure situations"	No comma between "emergency" and "exposure".	X			
48	Page no 8, Para 2.7, line no 2 & 4	The responsibilities and requirements for monitoring varies depending on the exposure situation. **Responsibilities** specific to the three exposure situations identified in GSR Part 3 (planned exposure situations, emergency, exposure situations and existing exposure situations) are discussed in detail in **section** 5, 6 and 7 of this Safety Guide.	Editorial ▪ The word "Responsibilites" may be corrected to "Responsibilities" ▪ The word "Secion" may be corrected to "section"	X			
49	2.7	The responsibilities and requirements for monitoring varies depending on the exposure situation. Responsibilites specific to the three exposure situations identified in GSR Part 3 and further explained in para 3.5 (planned exposure situations, emergency~~,~~ ~~–~~exposure situations and existing exposure situations) are discussed in detail in Secion 5, 6 and 7 of this Safety Guide.	Three exposure situations are subject of para. 3.5 in this Safety Guide. Please indicate this here to make the text more reader friendly. Additionally, please delete comma here as its presence here ich changing the meaning of the text.	X			The text from 3.5 was brough to para 2.7.

50	Para 2.8-2.15	The requirements of the GSR Part 3, are repeated exactly without any guidance.	These requirements are repeated in the whole context of the text several times.			X	Section 2 of the document is intended to quote the Requirements important to monitoring. Throughout the document, references to such quotes are included, to facilitate understanding. It is a matter of style adopted in Safety Guides.
51	2.15(f)	Move the following text from the REQUIREMENTS FOR MONITORING IN **PLANNED** EXPOSURE SITUATIONS to the REQUIREMENTS FOR MONITORING IN **EMERGENCY** EXPOSURE SITUATIONS: Establish and maintain a capability to conduct monitoring in an emergency in the event of unexpected increases in radiation levels or in concentrations of radionuclides in the environment due to an accident or other unusual event attributed to the authorized source or facility.	Since this information talks about in the event of an emergency, it fits better in the next section on REQUIREMENTS FOR MONITORING IN EMERGENCY EXPOSURE SITUATIONS.	X			

52	2.16 to 2.22 and section 6	Sections: • Requirements for Monitoring in Emergency Exposure Situations Monitoring in An Emergency Exposure Situation	General comment. The sections mainly refers to other documents and do not provide the guidance that may be expected from such IAEA standard (Safety Guide). Adding specific data (e.g. current Table 4) would provide better guidance. While the comment applies mainly to the said sections it can actually be extended to the whole document. As additional reference supporting this comment 1.12 states that this Safety Guide also provides recommendations on the interpretation of monitoring results, including for use in dose assessment. However, such recommendation on how to interpret monitoring data during emergencies and dose assessment is not provided (e.g. reference to decision making support tools)			X	Section 2 of the document is intended to quote the Requirements important to monitoring. Throughout the document, references to such quotes are included, to facilitate understanding. It is a matter of style adopted in Safety Guides. This is a general safety guide and specific guidance, particularly on monitoring in emergencies, is provided somewhere else (e.g. Ref 45 – EPR-Harmonized Assistance Capabilities 2017). DS-505 does not have the intention of repeating other already published IAEA documents, but mainly point to them wherever appropriate. General guidance on the use monitoring data for dose assessment is given in Section 9 (paragraphs 9.11 onwards).

53	2.21	Immediate precautions must be taken to prevent radiation doses from exceeding the threshold limits for the inevitable medical effects. This is accomplished by taking urgent measures before the occurrence of exposure or the release of radioactive materials, when the accident is discovered directly. Response actions must be taken immediately by the operator.	"Within emergency planning zones and emergency planning distances, arrangements shall be made for the timely monitoring and assessment of contamination, radioactive releases and exposures for the purpose of deciding on or adjusting the protective actions and other response actions that have to be taken or that are being taken."			X	Section 2 present the requirements related to monitoring in GSR part 3 and GSR part 7. The content in this section is mainly direct quotation.
54	Para 2.23 lineNo.1 part3	1) Add a sentence -Installing surveillance cameras to monitor the persons who are exclusively authorized to enter the permitted sites according to the nature of the work of each person. Add sentence-Computer programs to download the data of people allowed to enter these sites and determine the type of radioactive materials for that area.	Enhancing safety procedures on site			X	The proposed modifications are related to security. As stated in paragraph 1.24, Scope, monitoring for nuclear security purposes (physical protection) is out of the scope of this Safety Guide. Moreover, Section 2 is intended to present the requirements in GSR Part 3 and GSR Part 7 important for monitoring for the protection of the public and the environment.
55	2.23	The requirements in GSR Part 3 [1] for monitoring in existing exposure situations are only established within the context of remediation. Nevertheless, monitoring could provide essential data to satisfy a number of other requirements for existing exposure situations, as they are mentioned later in chapter.	Statement "Nevertheless, monitoring could provide essential data to satisfy a number of other requirements for existing exposure situations" is not clear, please provide additional explanation. See our suggestion.	X			

56	2.26	This section mentions reference levels from GSR Part 3. 2)	RASSC and WASSC need to agree on these reference levels. We need to align on terminology too. This may be the case where we need action levels and not reference levels.			X	Para 2.26 is a quotation from GSR Part 3 (paragraph 5.8 of GSR Part 3) which gives a recommendation of setting a reference level between 1-20 mSv for existing exposure situations. This terminology is in line with ICRP recommendations and the terminology is used throughout IAEA safety standards. The choice of a reference level within this range will be different for different situations 'depending on the feasibility of controlling the situation….'. The term action level has been used as a derived criterion in managing contaminated areas or in place of reference level – see examples from Chornobyl and Maralinga in IAEA GSG-15 (Annex III and Annex IV). The choice of a reference level and/or action level is outside the scope of this Safety Guide.

57	Page no 13 , Para 2.29	"Paragraph 5.12 of GRS Part 3 [1]"can be changed to "Paragraph 5.12 of **GSR** Part 3 [1]"	Editorial The word GRS may be corrected to "GSR"	X			
58	2.29	Paragraph 5.12 of ~~GRS~~ GSR Part 3 [1] states:	Typo. Same for paras 2.30, 2.31 and 2.33.	X			
59	2.29/1 (p.13), 2.30/1 (p.14), 2.31/1 (p.14), 2.33/1 (p.14)	GRS → GSR	Editorial.	X			
60	Page no 14 , Para 2.31 (c)	Shall monitor the area regularly during the remediation so as to verify levels of contamination, to verify compliance with the requirements for radioactive waste management, and to enable any unexpected levels of radiation to be detected and the remedial action plan to be modified accordingly, subject to **approval** by the regulatory body or other relevant authority".	Editorial The word "approaval" may be corrected to "approval"	X			
61	Page no 15 , Para 2.33 (b)	Establishment of an **infrastructure** to support continuing 'self-help protective actions' in the affected areas, such as by the provision of information and advice, and by monitoring."	Editorial The word "infraestructure" may be corrected to "infrastructure"	X			
62	2.33 (b) line1	"infrastructure"	Spelling	X			
63	Section 3 title (p.17)	CONCEPTS AND TERMS relevant for monitoring → CONCEPTS AND TERMS RELEVANT FOR MONITORING	Editorial.	X			

64	Section 3 (p.17)	This section seems newly added to the main text of this document instead "Definition" shown in DPP. Although the contents in this section are useful, whole of the section seems "Definition." So, an introductory paragraph under subsection "General" should be added at the beginning of this Section 3 to deliver the intent of this section.	Clarification.	X			
65	p.17/3 (para 3.1)	o The following is suggested. (before) 'Environmental matrices' is used ~~. (after) 'Environmental media' is used ~~~.	o Based on the IAEA Glossary (2022), the term of environmental monitoring already uses the term of environmental media. In my opinion, the environmental matrices is a new term. It could bring confusion. Instead of it, it is recommended that the media be used.	X			
66	p.17/14 (para 3.2)	o The following is suggested. (before) Discharges and releases may include solid and liquid aerosols. (after) Discharges and releases may include gases, aerosols, liquids or solids.	o Based on the IAEA Glossary (2022), it is recommended that these terms be revised.	X			
67	3.2 last line	Discharges and releases may include gases, aerosols, liquids or solids ~~solid and liquid aerosols.~~	Wording, see also the IAEA Glossary.	X			
68	3.2 title (p.17)	ENVIRONMENTAL RELEASES → DISCHARGE AND ENVIRONMENTAL RELEASES	Para 3.2 also mentions "discharge."	X			

69	Footnote page p.17	Bioindicator organisms are biota that might not be significant in relation to pathways of human exposure and are therefore not used for dose assessment purposes, but that ~~concentrate radionuclides effectively and so~~ can be utilized as sensitive indicators for assessing trends in environmental radiation levels and activity concentrations of radionuclides in the environment. ~~Indicator materials are selected because they concentrate radionuclides which are therefore usually more readily detectable than in foodstuffs, so the indicator organisms or materials provide a more sensitive indicator of environmental contamination.~~	There seems to be a confusion on the concepts and uses of bioindicators vs bioaccumulators. A bioindicator does not necessarily concentrate radioactivity nor a specific radionuclide.		X Text in footnotes amended for clarity as follows: "Bioindicator organisms are biota that might not be significant in relation to pathways of human exposure and are therefore not used for dose assessment purposes, but that ~~concentrate radionuclides effectively and so~~ can be utilized as sensitive indicators for assessing trends in environmental radiation levels and activity concentrations of radionuclides in the environment."		
70	3.3/ Third line	"External exposure is defined as "exposure to radiation from a source outside the body**"**, and internal exposure as "exposure to radiation from a source within the body"	Editorial comment	X			
71	3.4 Line 3	… One important purpose of monitoring is to provide data that enable the assessment of doses to the public and to exposures to fauna and flora when required (see paragraphs *1.6, 1.21 and 5.15*).	Please verify if these paras are correct here, it looks like they are referred here by mistake.	3.4 Line 3			

72	3.4 line 4/5	… that enable the assessment of doses to the public and ~~to~~ of exposures to fauna and flora when required (see paragraphs 1.6, 1.21 and 5.15).	Wording Please also check the first two references to the paragraphs, they seem to be wrong.	X			
73	3.4/4 (p.18)	…exposures to fauna and flora →…exposures to flora and fauna	Editorial.	X			
74	3.4	~~One important purpose of monitoring is to provide data that enable the assessment of doses to the public and to exposures to fauna and flora when required.~~	In various parts of the draft it is mentioned that the data provided through monitoring should be used for the evaluation of doses. As already mentioned during the TM and other occasions, annual doses are rarely estimated on the basis of environmental monitoring results and should not be estimated/calculated only in this way. In fact, there are several results < LoD (decision threshold) in routine monitoring that do not allow dose calculation without being too much conservative. The representativeness criterion of the calculated dose is not met, because too far from reality. Therefore, the annual effective dose to the representative person should not be estimated based on environmental monitoring. It could be done using models and the total amount of radioactivity discharged during a year, radionuclide by radionuclide. However, the results provided by the environmental monitoring could be compared to the results of models.		X Text is amended slightly to add clarity as follows (and see comment): "One important purpose of monitoring is to provide data that ~~enable~~ **can be used in** the assessment of doses to the public and to exposures to flora and fauna, when required, **or to confirm that models used to predict doses are adequate**.		In many cases models are used to estimate doses using results from source monitoring /discharges. Environmental monitoring can also be used in conjunction with models or to confirm that models used in dose assessment are adequate (as stated in GSG-10 para 5.3).

75	Page no18, Para 3.5	Paragraph 1.20 of GSR Part 3 [1] distinguishes between three different exposure situations: planned exposure situations, emergency exposure situations and **existing** exposure situations.	Editorial The word “exisiting” may be corrected to “existing”	X			
76	3.5 (a, b and c)	The definitions for planned exposure situation, emergency exposure situation and existing exposure situation could be moved to Section 2.11 for planned exposure situation, Section 2.16 for emergency exposure situation, and Section 2.23 for existing exposure situation.			X The text was modified by moving para 3.5 to para 2.7 to introduce the exposure situations rather than referencing to it.		

77	3.6	3.6. For the protection of the public in planned exposure situations, it is necessary to define a person whose dose can be used for determining compliance with dose constraints and dose limits. This is called the 'representative person' [29], who is a person that receives a dose that is representative of the more highly exposed individuals in the population. The representative person is generally a hypothetical construct and not an actual individual. Factors, such as the spatial distribution of radionuclides in the environment, the location, age, diet, and habits of the population group to which the representative person belongs, as relevant, should be considered when identifying the representative person and estimating the dose received.	Clarification. Dose constraints and dose limits only apply in planned exposure situations.		X The text was modified as follows: "For the protection of the **public in planned, existing and emergency exposure situations**, it is necessary to define a person whose dose can be used for determining compliance with dose constraints and dose limits, **and reference levels, as relevant.** This is called the 'representative person' [30], who is a person **assumed** to receive a dose that is representative of the more highly exposed individuals in the population. The representative person is generally a hypothetical construct and not an actual individual. Factors, such as the spatial distribution of radionuclides in the environment, the location, age, diet, and habits of the population group to which the representative person belongs, as relevant, should be considered when identifying the representative person and estimating the dose received."		

78	Page no 19 , Para 3.7	The term ‘representative person’ applies to planned exposure situations, **existing** exposure situations and emergency exposure situations [29]. However, the particular characteristics of the representative person in each situation, such as his or her location, habits and age group, may be different.	Editorial The word “exisiting” may be corrected to “existing”		X		
79	3.7	3.7. The term ‘representative person’ applies to planned exposure situations, existing ~~exisiting~~ exposure situations and emergency exposure situations [29]. ~~However,~~ The particular characteristics of the representative person in each situation, such as his or her location, habits and age group, may be different. For emergency exposure situations, vulnerability to radiation exposure should also be considered (i.e., pregnant women and children)	Editorial and Clarification. As for the vulnerability, see Requirement 5 (Protection strategy for a nuclear or radiological emergency) and footnote 13 of GSR Part 7.		X The text was modified as follows: “For emergencies, the operational criteria (i.e. operational intervention levels) need to be derived for a representative person with account taken of those members of the public that are most vulnerable to radiation exposure (i.e. pregnant women and children) [GSR Part 7]”.		

80	Page 19 3.8.	'Monitoring strategy' in the context of this Safety Guide refers to the national approach to establish the responsibilities of and interactions among the organizations that will conduct activities related to monitoring. ~~For emergency exposure situations, the monitoring strategy is related to the monitoring arrangements as part of the protection strategy[5] [5].~~	Duplication of para 6.4: Description regarding to the protection strategy should be moved to the section mentioning the monitoring strategy in the emergency exposure situation.		(X) Text was moved to footnote.		Even though this description is repeated in section 6, we decided to keep it here as the terminology used in the context of emergency preparedness is not very well known for those performing other monitoring activities, and it could be useful to introduce such concepts in section 3.
81	3.8-3.13	Shortening of the text. Some definitions can be deleted for example the definition what a "Source" is.	Most of the definitions here are also well defined in the IAEA Safety Glossary and/or are generally known. There is no need to copy this definitions here.			X	Monitoring strategies and programs would involve more than the usual nuclear organizations. Consequently, it is convenient to include definition of elements (such as "source") for those with less expertise in the matter.
82	3.9 (Second line)	(including~~,~~ resources, tools and techniques)	The first comma inside the parenthesis shall be deleted	X			
83	3.9 line 2	"including resources"	No comma between "including" and "resources".	X			

84	3.10 (last clause)	if radioactive substances are already dispersed in the environment, the portion of them to which people are exposed may be considered a source, such as ….	Adding an example for the last type of sources mentioned in the paragraph, makes it more clear.	X	"if radioactive substances are already dispersed in the environment, **such as those resulting from past practices that were not subject to regulatory control or that remain after an emergency exposure situation**, the portion of them to which people are exposed may be considered a source".		
85	Para 3.12, Line 7, Page 20	In new text example of 'bio indicators' may be included	To have an idea of bio indicator that concentrate radionuclides.	X			The following examples were now included (e.g., lichen and seaweed)
86	Page 24 para 3.12	It is written : *"Environmental monitoring programmes also include other physical, chemical and biological factors that can affect exposures"*. This needs clarification. What are the biological factors that are monitored and how are they used to interpret the data on radiological exposure?			X The text was modified as follows: "Environmental monitoring programmes may also include other physical, chemical and biological factors that can affect ~~exposures~~ the behaviour of radionuclides in the environment.		The sentence was rephrased for clarification.

87	3.12	Environmental monitoring' refers to the measurement of external dose rates due to sources in the environment or of radionuclide concentrations in environmental media [4]. Environmental monitoring is considered as the monitoring conducted outside the site giving rise to the exposure. Environmental monitoring programmes include measurements of radiation fields and radionuclide activity concentrations in environmental matrices relevant to human exposure, primarily in air, drinking water, sediments, soils, agricultural produce and foodstuffs, aquatic foods~~, as well as in bioindicators that concentrate radionuclides and provide a measure of trends in activity levels~~. Environmental monitoring programmes also include other physical, chemical and biological factors that can affect exposures.	There seems to be a confusion on the concepts and uses of bioindicators vs bioaccumulators. A bioindicator does not necessarily concentrate radioactivity nor a specific radionuclide.		X Text amended for clarity as follows: "Environmental monitoring programmes include measurements of radiation fields and radionuclide activity concentrations in environmental ~~matrices~~ media relevant to human exposure, primarily in air, drinking water, sediments, soils, agricultural produce and foodstuffs, aquatic foods, as well as in bioindicators (eg lichen, seaweed) that ~~concentrate radionuclides and~~ can provide a measure of trends in activity levels."		
88	Page 20 para 3.13	It is written : *Individual monitoring for members of the public would only be necessary for certain emergency exposure situations*." Although we completely agree it would be nice to make clear what are the corresponding situations (i.e. emergency or known contamination)		X			This is better explained in para 6.21 to 6.24. A reference to these paragraphs was included in para 3.13.

89	General 3.13/4(p.20)	The sentence "Individual monitoring for members of the public would only be necessary for certain emergency exposure situations" should be deleted. Some amendments would be needed for consistency in the document. (For example, the first sentence in Para 8.14 would be changed as following: "Individual monitoring for members of the public may be appropriate in certain emergency exposure situations (see paras 6.22–6.27) and in certain existing exposure situations, if necessary.")	Even under existing exposure situations, individual monitoring would be useful in some cases to achieve the objectives mentioned in Para 7.10, depending on the concentration level of residual radionuclides and other conditions. Actually, monitoring of individual exposure doses in the area on existing exposure situation was conducted after the Fukushima Daiichi NPPs accident. Therefore, the implementation of individual monitoring in existing exposure situations should not be avoided.	X			A sentence was added to 3.13 to reflect that in certain existing exposure situations resulting from emergencies, individual monitoring could be recommended. Other parts of the text were also amended accordingly.
90	Para 4.2	States might have legislative obligations to conduct environmental monitoring to protect people and the environment from non-radioactive pollutants. The framework for radiological monitoring ~~should~~ **may** be compatible and consistent with such obligations	The framework for non-radioactive and radiological pollutants, in generally is different.			X	Radiological monitoring is generally part of a broader monitoring programme, and they should be consistent. Therefore, the "should" statement must be kept.

91	Para 4.3.	With regard to planned exposure situations, the regulatory body **shall be responsible, as appropriate, for** ~~is required to~~ review and approve monitoring programmes and review periodic reports on monitoring data and public exposures, make provisions for an independent environmental monitoring programme, and assess the cumulative radiological impact of multiple sources (see para. 3.135 of GSR Part 3 [1]).	Harmonization of requirements p. 4.3 DS505 with requirements p. 3.135 GSR Part 3.		X With regard to planned exposure situations, the regulatory body is required to review and approve, **as appropriate**, monitoring programmes and review the periodic reports on monitoring data and public exposures, make provisions for an independent environmental monitoring programme, and assess the cumulative radiological impact of multiple sources (see para…"		The recommendations provided in Safety Guide DS505 (and others) are based in relevant requirements (such as GSR Part 3) expressed as 'should' statements. 'Shall' statements are specific for Safety Requirements publications.
92	Para 4.3.	With regard to planned exposure situations, the regulatory body **shall be responsible, as appropriate, for** ~~is required to~~ review and approve monitoring programmes and review periodic reports on monitoring data and public exposures, make provisions for an independent environmental monitoring programme, and assess the cumulative radiological impact of multiple sources (see para. 3.135 of GSR Part 3 [1]).	Harmonization of requirements p. 4.3 DS505 with requirements p. 3.135 GSR Part 3.		X With regard to planned exposure situations, the regulatory body is required to review and approve, **as appropriate**, monitoring programmes and review the periodic reports on monitoring data and public exposures, make provisions for an independent environmental monitoring programme, and assess the cumulative radiological impact of multiple sources (see para…"		The recommendations provided in Safety Guide DS505 (and others) are based in relevant requirements (such as GSR Part 3) expressed as 'should' statements. 'Shall' statements are specific for Safety Requirements publications.

93	4.3	The regulatory body**, or other relevant body as appropriate,** should assist in the coordination of environmental monitoring and individual monitoring in an emergency.	Individual monitoring has a clear connection to healthcare, which may involve other organizations, depending on national arrangements.	X			
94	Para 4.4	**The government might delegate specific responsibilities for monitoring to other parties.**	Regulatory body cannot delegate specific responsibilities for monitoring to other parties	X			The word "responsibilities" was replaced to: "activities related to".
95	Para 4.4/1	**The government or the regulatory body may implement itself or might delegate specific responsibilities for monitoring to other parties.**	In Section 4: Table 1: it is clearly written that **Conduct limited confirmatory Environmental monitoring, as appropriate in** planned and existing exposure situation is the responsibility of Regulatory Body. This statement and para 4.4 contradict each other. Also, in para 5.10, line no 4 it is written clearly that **regulatory body may implement itself or delegate through agreements the implementation of this independent program of source and environmental monitoring to other parties, such as technical support organizations with adequate technical resources.** This para and para 4.4 contradict each other.	X			Paragraph 4.4 was rephrased to make it clear that the regulatory authority cannot delegate responsibilities, but the execution of some activities related to monitoring (sampling, analyses, etc.)

96	4.4	"The government or the regulatory body might delegate specific responsibilities for monitoring to other parties. These parties should possess sufficient technical capacity, equipment, expertise, and authority to fulfil their responsibilities and should remain independent ~~of any government department and~~ of any parties that are responsible for the promotion and development of the practices being regulated, as well as of any registrant, licensee, designer or constructor of the facilities or activities being regulated."	This clause contains a loophole. By saying the government or regulatory body "might" delegate responsibilities for monitoring to other parties, it implies that the government could choose not to delegate such responsibility and instead conduct monitoring itself. Obviously, this would not be "independent of any government department." Furthermore, in an emergency exposure situation, it may not be possible to keep responsibility for monitoring independent of any government department.		X The text was modified as follows: "The government or the regulatory body might delegate specific ~~responsibilities~~ activities related to monitoring to other parties. These parties should possess sufficient technical capacity and should remain independent of ~~any government department and of~~ any parties that are responsible for the promotion and development of the practices being regulated, as well as of any registrant, licensee, designer or constructor of the facilities or activities being regulated."		Paragraph 4.4 was rephrased to make it clear that the regulatory authority cannot delegate responsibilities, but the execution of some activities related to monitoring (sampling, analyses, etc.)
97	4.6	The responsibilities of the operating organization, regulatory body, response organizations and government may	Consistency with GSR Part 7. GSR Part 7 refers to governments, operating organizations, regulatory bodies and response organizations.	X			

98	Para 4.6 (Table 1)		The table indicates that in an emergency exposure situation the regulatory body ensures coordination of individual monitoring of the public, but it does not indicate who carries out this monitoring (see para 6.3 of the Safety Guide). It is recommended to bring footnote "c" to the Table 1 in accordance with paragraphs 7.6 and 7.7 of the Safety Guide, and indicate that if the operating organization is not present, responsibility for remediation is determined by the government.	X			A footnote was included linked to the responsibilities of the regulatory body in emergency exposure situation to clarify that the regulatory body can conduct the monitoring itself or delegate it.
99	Table 1	Add response organizations, and revise roles assigned under emergency exposure situations	Consistency with GSR Part 7. The assignment of roles in Table 1 for emergency exposure situations are not consistent with GSR Part 7. For example, GSR Part 7 does not assign to the regulatory body the roles as currently listed in Table 1. These could be assigned to the operating organization, regulatory body or other response organization depending on national arrangements.		X The following footnotes to the table was included: "(d)The regulatory body can perform itself or delegate the execution of some activities related to monitoring (see para 4.4). (e) In an emergency these responsibilities can be assigned to other response organization depending on national arrangements."		As the table should be general for the three types of exposure situations, a footnote was included to reflect the particularities for emergencies.

100	p.23 (section 4 – Table 1)	o The following is suggested. In the third column of the table 1, regarding the tern of near field (before) near field (after) near or local or small area	o Based on the IAEA Glossary (2022), the term of near field is usually used in the disposal facility. If it is not defined, it could bring confusion. So, it is recommended that the different term be used.		X		The text was modified as following: Near field was replaced by 'local'.
101	Page no 23 ,3rd row in Table-1	"Review and **approve** of monitoring programmes of registrants and licensees" may be modified to "Review and **approval** of monitoring programmes of registrants and licensees"	Editorial The word "approve" may be corrected as **"approval"**		X		Instead of changing "approve" for "approval" the "of' was removed, so the style remains consistent with the rest of the table.
102	p. 4.6 (Table 1)	-	Proposed to add to Table 1 information (in the form of a footnote) about regulatory body right to delegate of implementation of independent programme of source and environmental monitoring to other parties, such as technical support organizations, as stated in p. 5.10 DS505	X			

103	Table 1		Table 1 needs to be reviewed to make it applicable in the UK. It may be that another organization e.g UKHSA is responsible for some aspects. This is acknowledged in para 6.3. For example, the following responsibilities are not generally for the UK regulator: - Coordinate large scale and near field environmental monitoring (emergency) - Coordinate individual monitoring of the public, as appropriate (emergency) The responsibilities need to be aligned with GSR level documents.		X		Para 4.4 mentions that the implementation of some activities can be delegated to other parties by the regulatory body. Nevertheless, the responsibility remains with the regulatory body (see Requirement 32 of GSR Part 3). A note to the table referring to para 4.4 was included. The role of the" response organizations' was also included.

104	Table 1 (Emergency)	Responsibility of individual monitoring may be included.	The responsibilities for the conduct of individual monitoring are not given. The operating organization should be responsible for conduct of individual monitoring and provision of equipment to the individuals.		X INDIVIDUAL MONITORING was added to the title of Table 1. The responsibilities of regulatory body are already indicated in the table i.e., "coordinate individual monitoring of the public".		Individual monitoring referred in this guide is of the members of the public; in this case the responsibility should remain with the regulatory authority. This is stated in the column reserved for the regulatory authority in table 1. "coordinate individual monitoring of the public, as appropriate.' A footnote was included linked to the responsibilities of the regulatory body to clarify that the regulatory body can conduct the monitoring itself or delegate it.
105	Table 1 page 23	Planned / ~~Authorized~~ Licensed practice/source	Authorization can be the process of licensing or registration (see e.g. footnote 8). Please change also footnote b accordingly.	X			
106	Table 1 page 23	Planned / Multiple Sources / Operating organization: Source monitoring of its own facility[b], site specific environmental monitoring[b], dose assessment for its own facility[b]	The operating organization can only perform the dose assessment for its own facility.	X			
107	Table 1	Licensed ~~Authorized~~ practice/source	Editorial	X			

108	Table 1 (first row after header)	Exempted ~~or~~, cleared and notified practices	In paragraph 5.3, it says "For practices which notification alone is sufficient there is no requirement for monitoring in GSR Part 3 [1]." (Also, it makes the table more complete)	X			
109	Table 1	A note can be added under the table for clarifying of the responsibility of the operating organization in a planned exposure for registered practice/source: "The source monitoring for the registered practice/source may not be necessary"	According to the paragraph 5.6 of this draft: "For registered practices, the regulatory body might require source monitoring to be performed,"		X The following note to the table was added: "For registered practices, the regulatory body might require source monitoring to be performed"		
110	Page 28 Table 1	Emergency situation may appear after existing situations (there is a graduation in the requirements)				X	As in the rest of the document, table 1 follows GSR3 Part 3 logic: Planned, Emergency, and Existing. We must also consider that an existing exposure situation can originate from an emergency.
111	4. TABLE 1 (p.23)	Add "Not applicable" to the blank column under Regulatory body.	Clarification.	X			

112	Para 4.6 (Table 1)		Proposed to add to Table 1 information (in the form of a footnote) about regulatory body right to delegate of implementation of independent programme of source and environmental monitoring to other parties, such as technical support organizations, as stated in para 5.10 DS505	X			
113	4. annotation c of TABLE 1 (p.23), 7.6 and 7.7 (pp.44-45)	Who has responsibility in cases where it is not possible to identify a responsible party; · the government (Para 7.6), · a responsible body assigned by the government (Para 7.7), or · regulatory body (annotation c of TABLE 1)? Please check consistency among those sentences.	Clarification.	X			Footnote (e) from Table 1 was amended as follows for consistency: "If the operating organization is not present, ~~the regulatory body has those responsibilities~~ <u>the government should assign a responsible body</u>".
114	Table 1		Delete the text on exempted, registered and multiple sources as not relevant			X	The explanation provided Table 1 and from para 5.2 to para 5.5 is included to be useful for a broader audience of users of the document.

115	5.2. Addition at end of paragraph.	"However, while not amenable to control, it might be necessary to measure these sources as part of the pre-operational baseline".	This addition is for clarity.			X	As paragraph 5.2 is related to excluded exposures, adding this statement here may cause confusion. Guidance on baseline studies in the pre-operational stage is given in paragraph 5.17.
116	5.5	For authorized practices/activities [1], routine monitoring programmes are required (see para. 3.127(f) of GSR Part 3 [1]).	What is the difference between authorized practice and authorized activity? Both terms are used. If they are synonyms, please indicate this somewhere in the text, as its otherwise confusing.	X			Activities is more general than practices, but in the context of planned exposure situations, the terms are interchangeable. A footnote was included in 5.3 to explain this.
117	Footnote 8 (page 25)	8 Sources or practices for which neither exclusion nor exemption is appropriate are required to be notified to or authorized by the regulatory body [1]. The authorization can take the form of either a registration or a license. Examples of licensed practices are nuclear power plants and other fuel cycle installations. Examples of registered practices are those conducted at small research institutes and small hospitals, where the usage of short lived radionuclides and the corresponding discharges to the environment are low.	Clarification. Notification should be added here as "Notification", "registration" and "licensing" are the key three steps, and the phrase "authorization" is used for registration and licensing.	X			

118	annotation No.8 (p.25)	Examples of licensed practices are operations of nuclear power plants and of other fuel cycle installations.	Clarification: "nuclear power plants" or "other fuel cycle installations" themselves may be licensed sites but not practices. Please add examples of practices.	X			
119	Page no 26 , Para 5.7	During the authorization process, the conditions of the operation of facilities that are likely to discharge radioactivity to the environment, which are related to the management of gaseous, airborne and liquid effluents should be defined by the regulatory **body**.	Editorial The word "rody" may be corrected to "body"	X			
120	5.7	During the authorization process, the conditions of the operation of facilities that are likely to discharge radioactivity to the environment, which are related to the management of gaseous, airborne and liquid effluents should be defined by the regulatory **body**.	Typo in the last word of the sentence	X			
121	5.7. line 3	"regulatory body"	Spelling	X			
122	5.7	Change "regulatory rody" to "regulatory body".	Correct typographical error	X			

123	p. 5.7	During the authorization process, the conditions of the operation of facilities that are likely to discharge radioactivity to the environment, which are related to the management of gaseous, airborne and liquid effluents ~~should be defined~~ **shall be established or approved** by the regulatory rody. In general, the following data should be established as part of the authorization process [3]: (a) The total inventory of radionuclides in the facility or activity; (b) The total activity of radionuclides expected to be discharged during a defined period in different operational states[I]; (c) The exposure pathways that contribute to the doses to the public; (d) The expected doses to the public due to discharges; (e**) list of radionuclides or their groups discharges of which should be limited,** ~~(e)~~ (f) The discharge limits.	1. Para 3.123 GSR Part 3 states: The regulatory body shall establish or approve operational limits and conditions relating to public exposure, including authorized limits for discharges. 2. Para 5.68 GSG-9 states: discharge limits should be specified for different radionuclides, or groups of radionuclides, depending on the significance of the radionuclides in terms of dose to the representative person.		X Instead of adding the new item to the list, item (e) was modified as follows: e) The discharge limits, **specified for different radionuclides, or groups of radionuclides**		The first comment was rejected as the recommendations provided in Safety Guides are expressed as 'should' statements. 'Shall' statements are specific for requirements publications. The second part of the comment was accepted with modification.

124	Para 5.7	During the authorization process, the conditions of the operation of facilities that are likely to discharge radioactivity to the environment, which are related to the management of gaseous, airborne and liquid effluents s~~hould be defined~~ **shall be established or approved** by the regulatory body. In general, the following data should be established as part of the authorization process [3]: (a) The total inventory of radionuclides in the facility or activity; (b) The total activity of radionuclides expected to be discharged during a defined period in different operational states[1]; (c) The exposure pathways that contribute to the doses to the public; (d) The expected doses to the public due to discharges; (e) **list of radionuclides or their groups discharges of which should be limited,** (f) <u>(f) The discharge limits.</u>	1. Para 3.123 GSR Part3 states: The regulatory body shall establish or approve operational limits and conditions relating to public exposure, including authorized limits for discharges. 2. Para 5.68 GSG-9 states: discharge limits should be specified for different radionuclides, or groups of radionuclides, depending on the significance of the radionuclides in terms of dose to the representative person.		X Instead of adding the new item to the list, item (e) was modified as follows: e) The discharge limits, **specified for different radionuclides, or groups of radionuclides**		The first comment was rejected as the recommendations provided in Safety Guides are expressed as 'should' statements. 'Shall' statements are specific for requirements publications. The second part of the comment was accepted with modification.
125	5.9 Line 5	evidence that ~~that~~ authorized facilities and activities	"that' is repeated	X			
126	5.9. line 5	"evidence that authorized"	Correction repetition of "that"	X			

127	Para No. 5.10	The para may not be made as binding to regulatory body for an independent monitoring programme of source measurement. This is not implementable by regulatory body	It is stated that the regulatory body is required to make arrangements for an independent monitoring programme of source and environmental measurements to verify the quality of results provided by the operating organization and to confirm that the doses to members of the public are below dose constraints. However, it is impractical for regulatory body to make arrangements for source monitoring. Therefore, the requirement related to independent source monitoring for regulatory body may be ommitted.		X The text was modified as follows: "The regulatory body is required, as appropriate, to make arrangements for an independent monitoring programme ~~of source and environmental measurements~~ to verify the quality of results provided by the operating organization and to confirm that the doses to members of the public are below dose ~~constraints~~ limits (see para. 3.135(c) of GSR Part 3 [1]. The regulatory body may implement itself or delegate through agreements the implementation of this independent programme ~~of source and environmental monitoring~~ to other parties, such as technical support organizations with adequate technical resources; however, the responsibility for such a programme remains with the regulatory body."		

128	p.27/5	o The following is suggested. (before) 5.10. The regulatory body is ~~~ for independent monitoring programme of source and environmental measurements to verify ~~. (after) 5.10. The regulatory body is ~~~ for independent monitoring programme ~~(of source and environmental measurements)~~ to verify ~~~.	o 3.135 (c) of GSR Part 3 says that making provision for an independent monitoring programme. o RS-G-1.8 3.6 (a) say that although the licensees should be generally responsible for source and environmental monitoring, in some cases (such as major practices or sources) the regulatory body may carry out a limited confirmatory programme of environmental measurements to verify the quality of results provided by the licensee. o Based on the things above, in my opinion, the regulatory body can't conduct the independent source monitoring easily in planned exposure situations due to its limited resources and access to the facility or activity. o So, it is recommended that the phrase be deleted or modified as appropriate.	X			

129	5.10	5.10. The regulatory body is required, as appropriate, to make arrangements for an independent monitoring programme of ~~source and~~ environmental measurements to verify the quality of results provided by the operating organization and to confirm that the doses to members of the public are below dose constraints (see para. 3.135(c) of GSR Part 3 [1]). The regulatory body may implement itself or delegate through agreements the implementation of this independent programme of ~~source and~~ environmental monitoring to other parties, such as technical support organizations with adequate technical resources; however, the responsibility for such a programme remains with the regulatory body.	For consistency with Table 1 of DS505 and para. 3.135 of GSR Part 3. Para. 3.135 of GSR Part 3 requires the responsibilities of the regulatory body as appropriate, but para 5.10 of DS505 requires with no exception. Moreover, Table 1 of DS505 states the responsibility of the regulatory body for environmental monitoring, not for source monitoring.		X The text was modified as follows: "The regulatory body is required, as appropriate, to make arrangements for an independent monitoring programme ~~of source and environmental measurements~~ to verify the quality of results provided by the operating organization and to confirm that the doses to members of the public are below dose ~~constraints~~ limits (see para. 3.135(c) of GSR Part 3 [1]. The regulatory body may implement itself or delegate through agreements the implementation of this independent programme ~~of source and environmental monitoring~~ to other parties, such as technical support organizations with adequate technical resources; however, the responsibility for such a programme remains with the regulatory body."		

130	5.10	The regulatory body is required to make arrangements for an independent monitoring programme of source and environmental measurements to verify the quality of results provided by the operating organization and to confirm that the doses to members of the public are below ~~dose constraints (see para. 3.135(c) of GSR Part 3 [1].~~ dose limits.	Dose constraints are within the responsibility of the operator. They are not regulated by authorities. The quotation in brackets is wrong.		X The text was modified as follows: "The regulatory body is required, as appropriate, to make arrangements for an independent monitoring programme ~~of source and environmental measurements~~ to verify the quality of results provided by the operating organization and to confirm that the doses to members of the public are below dose ~~constraints~~ limits (see para. 3.135(c) of GSR Part 3 [1]. The regulatory body may implement itself or delegate through agreements the implementation of this independent programme ~~of source and environmental monitoring~~ to other parties, such as technical support organizations with adequate technical resources; however, the responsibility for such a programme remains with the regulatory body."		

131	5.10	Recommend stating that the regulatory body can choose to make arrangements for independent monitoring…, if it deems it necessary.	Independent monitoring may not be prudent, or necessary for all planned exposure situations.		X The text was modified as follows: "The regulatory body is required, as appropriate, to make arrangements for an independent monitoring programme ~~of source and environmental measurements~~ to verify the quality of results provided by the operating organization and to confirm that the doses to members of the public are below dose ~~constraints~~ limits (see para. 3.135(c) of GSR Part 3 [1]. The regulatory body may implement itself or delegate through agreements the implementation of this independent programme ~~of source and environmental monitoring~~ to other parties, such as technical support organizations with adequate technical resources; however, the responsibility for such a programme remains with the regulatory body."		

132	5.11	5.11. The regulatory body is required, as appropriate, to assess the total radiological impact based on the results of monitoring conducted by operating organizations and other parties (see para. 3.135(d) of GSR Part 3 [1]. For the assessment of the total public exposure due to multiple authorized sources and practices that might have impact on the same population groups, the cumulative radiological impact should be considered.	For consistency with para. 3.135 of GSR Part 3. Para. 3.135 of GSR Part 3 requires the responsibilities of the regulatory body as appropriate, but para 5.11 of DS505 requires with no exception.	X			
133	5.12 (a)	To demonstrate compliance of the facility or activity with the authorized discharge limits, radiation dose limits/constraints and operational conditions concerning the impact on the public and the environment	Some countries may provide options to demonstrate compliance with regulatory requirements either through discharge limits or exposure estimations to maximally exposed members of the public	X			
134	5.12	(d) To provide input to the periodic safety reviews, including the reassessment of the ~~environmental~~ radiological environmental impact and, if necessary, the review of the discharge limits;	Editorial.	X			

135	5.12 (c)	Clarify the definition of "unanticipated operational occurrences" in this passage: "To check the conditions of operation and verify the adequacy of controls on discharges from a source and to provide an early warning of unanticipated operational occurrences, which might trigger the need of additional monitoring, mitigation and corrective actions on the facility or activity."	What is the definition of "unanticipated operational occurrences?" Could it include incidents that give rise to an emergency? If so, the passage should make reference to section "6. Monitoring in an Emergency Exposure Situation.".		X The text was modified as follows: "To check the conditions of operation and verify the adequacy of controls on discharges from a source and to provide an early warning of ~~un~~anticipated operational occurrences, which might trigger the need of additional monitoring, mitigation and corrective actions on the facility or activity."		The word "unanticipated" was replaced for "anticipated" according to the IAEA Safety Standards SSR-2/2, SSG-70 and the IAEA Safety Glossary.
136	Page no 28 , last bullet	5.12. (j) is mistakenly written as 5.12 (e). Corrected statement would be - **(j)** To evaluate long term trends.	Sequence of bullet is not correct. Bullet (e) at the last may be corrected to bullet (j)	X			
137	5.12	List labelling – last item given as "(e)" should be "(j)"	Correct typographical error	X			
138	Para: 5.12 (i), Page 28	In new text example of an 'interested parties' may be included	To have an idea regarding interested parties	X			The definition of 'interested party' as in GSR Part 3 was now added as a footnote
139	5.12	(j) To evaluate long term trends.	The bullet point should be (j) instead of (e)	X			

140	5.12	(k) maintain competences for emergency monitoring and to provide a baseline for the assessment of radiological impact of emergency releases to the environment	Even though there is chapter 6 provides information about emergency situations, the general need to establish and maintain baseline information is not clearly stated elsewhere.		X Para 5.5 was modified as follows: "These monitoring programmes might also contribute to maintain competences for emergency monitoring and provide a baseline for the assessment of radiological impact of emergencies , although not all facilities and activities will need full emergency monitoring capability."		The objectives in 5.12 are 'should' statements and general, so they should apply to all facilities. However, not all facilities will need to maintain competence for emergency monitoring. Para 5.5 somehow addresses the role of monitoring programmes in the operational stage in maintaining competency for emergency monitoring.
141	Para 5.12	(j) To evaluate long term trends	Incorrect alphabetical ordering	X			

142	5.12	The objectives of a monitoring programme for the protection of the public and the environment in a planned exposure situation, should be as follows: (a) To demonstrate compliance of the facility or activity with the authorized discharge limits and operational conditions concerning the impact on the public and the environment; (b) To provide information and data for the radiological environmental impact assessment [2], including the evaluation of doses to the representative person; (c) To check the conditions of operation and verify the adequacy of controls on discharges from a source and to provide an early warning of unanticipated operational occurrences, which might trigger the need of additional monitoring, mitigation and corrective actions on the facility or activity; (d) To provide input to the periodic safety reviews, including the reassessment of the environmental radiological environmental impact and, if necessary, the review of the discharge limits; (e) To detect unexpected or unauthorized discharge, including fugitive releases; (f) To detect any unexpected increase in radionuclide concentrations in the environment; (g) To assess the buildup of activity concentrations in the environment arising from discharges; ~~(h) To verify or validate environmental models used in the prospective radiological environmental impact assessment;~~ (i) To provide information for interest-	The document mentions the validation of models as another objective of the environmental monitoring. In practice results from environmental monitoring can be compared to results obtained from models, with the objective to verify the consistency with the results of the impact studies. On the contrary, validation of models should be based on specific experiments and specific data, which could not be collected by routine monitoring.			X	Results from environmental monitoring can be used to confirm that the environmental models used in dose assessment are adequate, and, with care, to validate the models used, if sufficient supporting information is collected with the monitoring results. See para 5.3 of GSG 10.

143	5.13	5.13. If required in the national regulations, dose rates to the reference ~~representative~~ animals and plants may also be evaluated with a methodology as described in annex I of GSG-10 [2], based on the ICRP approach for the protection of the environment [20]. To the extent possible, monitoring programmes for environmental protection should be integrated to fulfill dose assessment objectives for the protection of people and flora and fauna. The environmental media and locations sampled to support human dose assessment might also be useful for the dose assessment of flora and fauna as radionuclide activity concentrations in biota are likely to be estimated from activity concentrations measured in environmental media (e.g. water, soil, sediments) taking account of relevant exposure pathways.	Editorial. Consistency with GSR Part 3 and GSG-8, 9, 10.	X			
144	5.13/3 (p.28)	[20] → [19]	Editorial.	X			
145	Para No. 5.14	The specific information like sampling media, frequency, analysis, location, direction etc. may be included in detail.	The general information regarding the source and environmental monitoring requirements for each facility stage is given. However, the specific information like sampling media, frequency, analysis, location, direction etc. is required to be included for more guidance.			X	Section 8 and Annex 1 provide specific guidance on these matters. To avoid repetition, we consider that it is not necessary to include these details here.

146	5.15	Nevertheless, any decision to reduce the frequency of sampling or the scope of the environmental monitoring programme should be justified **and documented. Account** should be taken of potential changes in the discharge regimes or unexpected releases, as well as any concerns raised by the public.	Clarification of the sentences. Two different things were put in one sentence. Also, please consider if "account taken" could be replaced with "registered/ keeping track" to pinpoint that a record should be kept of the changes (and their justifications) to the programme .	X			
147	5.16	Monitoring programmes should be reassessed **as often as established by regulatory body and also in cases** when changes are anticipated in operations of the facility or activity, which affect the radionuclides composition or magnitude of the discharges, leading for example to a modification of the discharge authorization, or when significant changes in the local environment or in the habits of the local population are observed.	The regulatory body shall be responsible, as appropriate, for review and approval of monitoring programmes of registrants and licensees (p. 3.135 GSR Part 3)		X The text was modified as follows: "Monitoring programmes should be reassessed **with the frequency established by the regulatory body or** when changes are anticipated in operations of the facility or activity, which affect the radionuclides composition or magnitude of the discharges, leading for example to a modification of the discharge authorization, or when significant changes in the local environment or in the habits of the local population are observed."		

148	Para 5.16	Monitoring programmes should be reassessed **as often as established by regulatory body and also in cases** when changes are anticipated in operations of the facility or activity, which affect the radionuclides composition or magnitude of the discharges, leading for example to a modification of the discharge authorization, or when significant changes in the local environment or in the habits of the local population are observed.	The regulatory body shall be responsible, as appropriate, for review and approval of monitoring programmes of registrants and licensees (para 3.135 GSR Part 3)		X The text was modified as follows: "Monitoring programmes should be reassessed **with the frequency established by the regulatory body or** when changes are anticipated in operations of the facility or activity, which affect the radionuclides composition or magnitude of the discharges, leading for example to a modification of the discharge authorization, or when significant changes in the local environment or in the habits of the local population are observed."		

149	5.16	"Monitoring programmes should be reassessed when changes are anticipated in operations of the facility or activity, which affect the radionuclides composition or magnitude of the discharges, leading for example to a modification of the discharge authorization, or when significant changes in the local environment or in the habits of the local population are observed. Changes to the monitoring programme should be made in consultation with, and communicated clearly to, the public."	Consultation and communication with the public are critical for reassurance.		X The following sentence was added: "It is advisable to communicate the changes in the monitoring programmes to the public, as appropriate."		Engage the public in the design of monitoring programes is not a requirement, even though it is a good practice. A sentence was added to reflect it.
150	5.17	Pre-operational studies should include the monitoring of the environmental matrices mentioned in para. 3.1 in this Safety Guide, such that the measurements that are contemplated to occur during the operational stage (i.e., para 5.26) are provided with accurate baseline values.	Recommend emphasizing the need for baseline environmental measurements from which comparisons can be made during the operational stage	X			

151	5.17	Pre-operational studies[11] for those facilities and activities for which a site evaluation is part of the authorization process should be performed in planned exposure situations to establish baseline[12] environmental radiation levels and activity concentrations for the purpose of subsequently determining the radiological impact of the source. The results from the baseline characterization studies should be used for future evaluation of the impact of the facility on the site and the surrounding area from its operation, determining acceptability of proposes decommissioning options and establishing end state criteria and demonstrate compliance with the proposed end state [33–35]. Pre-operational assessments should also provide information for use in the prospective assessment of doses to the public [2], such as information on the expected inventories of radionuclides during normal operation of a facility, the possible discharge pathways and the likely amounts that will be discharged to the environment, with due consideration of the effluent treatment systems that will be installed.	We suggest to incorporate footnotes 11 and 12 into the body of para 5.17 as should statements due to their importance.	X			
152	5.17 Line 8	… Pre-operational studies should include the monitoring of the environmental matrices ~~mentioned~~ explained in para. 3.1 in this Safety Guide.	Clarification	X			

153	Para:5.18, Line 2, Page 29	In new text example of an ‘indicator materials’ may be included	To have an idea of ‘indicator materials’ for the radionuclides	X			The following examples were included: water catchment soils, marine and riverine sediments.

154	5.19	The pre-operational monitoring programme should be initiated in sufficient time before the start of operation, ~~(e.g. for nuclear installations it should be undertaken 2–3 years before the start of operation)~~ to be able to study the possible effect of the annual variability in the local environment on the measurements and the results obtained. The results of this pre-operational monitoring should be used as an input to the development of the monitoring programme for the operational stage. So, for nuclear power plants an environmental monitoring programme should be implemented in accordance with the requirements of the regulatory body. A pre-operational programme should be implemented two to three years before the planned commissioning of the plant. This pre-operational programme should provide for the measurement of background radiation levels in the vicinity of the plant and their variation over and between the seasons. It should also provide the basis for the operational programme of environmental monitoring and should include the routine collection and radionuclide analyses of various samples, such as samples of vegetation, air, milk, water, sediment, fish and environmental media collected from several fixed and identified locations off the site.	Statement about initiating of the pre-operational monitoring programme was firstly part of NS-G-2.7, Radiation Protection and Radioactive Waste Management in the Operation of Nuclear Power Plants, which is superseded. It looks like that in the follow-up Safety Guides this statement is not mentioned anymore and that it was lost due to all the revisions. **We suggest to incorporate the current statement in DS505, as other Safety Guides are referencing it respectively, see for example para. 8.34 of DS524.**		X The statement was included as a footnote as follows: " For nuclear power plants a pre-operational environmental monitoring programme should be implemented two to three years before the planned commissioning of the plant. This pre-operational programme should provide for the measurement of background radiation levels in the vicinity of the plant and their variation over and between the seasons. It should also provide the basis for the operational programme of environmental monitoring and should include the routine collection and radionuclide analyses of various samples, such as samples of vegetation, air, milk, water, sediment, fish, and environmental media collected from several fixed and identified locations off the site."		

155	5.20	~~5.20. At the pre-operational stage, one or more areas for control measurements13 that are beyond the range of impact from the facility or activity, should be identified. If such areas are not covered in national environmental monitoring programmes, pre-operational monitoring should also be undertaken in these areas.~~	When something is beyond the impact of the facility, it is unlogic to demand something.		X The text was modified as follows: "At the pre-operational stage, one or more areas **that can be assumed as not being impacted by the** ~~for control measurements13 that are beyond the range of impact from~~ the facility or activity, should be identified. If such areas are not **already** covered in national environmental monitoring programmes, pre-operational monitoring should also be undertaken in these areas **as** control measurements for comparison.		Undertaking measurements in an area not expected to be impacted by a facility for comparison is an established practice. The text was modified, and the footnote was brought to the main text.

156	Section 5.21	There are three types of source monitoring: grab, composite, and continuous. Grab samples might be needed for unstable parameters. Composite samples might be needed when effluent quality is not expected to be relatively constant. Continuous monitoring might be needed when effluent quality is expected to be highly variable over weekly timeframes.	Mention that there are three types of source monitoring: grab, composite, and continuous. Guidance should be given when to take each type of sample. For example, grab samples might be needed for unstable parameters. Composite samples might be needed when effluent quality is not expected to be relatively constant. Continuous monitoring might be needed when effluent quality is expected to be highly variable over weekly timeframes.			X	This would be too detailed for this section in this generic safety guide. Guidance in this regard is provided in Annex 1, particularly in paragraphs A-2 to A-7.
157	Para 5.21	…The monitoring of radioactive discharges may entail measurements for specific radionuclides or ~~gross~~ **total** activity measurements, as appropriate…	Clarification of the term.	X			
158	5.22	In the case of batch discharges, the material discharged should be adequately characterized by the volume of the batch and the radionuclide composition of a sample taken from either (a) the homogenized batch prior to discharge; or (b) a flow proportional sample taken during the discharge process.	This is used practice in the UK and is useful where it is difficult to ensure homogeneity of the batch prior to sampling.				

159	Para 5.23	The expected variation with time in the discharge rates of the radionuclides and in the radionuclide composition and **volume.**	In sampling the composition and volume both are important.		X The text was modified as follows: "The expected variation with time in the discharge rates, ~~of the radionuclides and~~ in the composition of radionuclides and the volume of effluent involved."		
160	5.23/1 (p.31)	(b) The expected variation with time in the discharge rates of the radionuclides and in the radionuclide composition Why does it need to add "the nuclide composition" to (b) of Para 5.19 of RS-G-1.8? If necessary, it is preferable to state below: (b) The expected variation with time in the discharge rates and the composition of radionuclides	Clarification. "discharge rates of the radionuclides" and "the radionuclide composition" may mean the same.	X			
161	5.23(c)	(c) The likelihood of unplanned ~~discharges~~ release requiring prompt detection and notification.	Discharges is Planned and controlled release of radioactive substances	X			
162	5.23(C)	The likelihood of abnormal or unexpected releases requiring prompt detection, notification, and possible mitigation.	Discharges are by definition planned, this change will make the language consistent with 5.25. It is important to monitor so that if something is discharged, there may be a mitigation to prevent the spread of the discharge or to quarantine or limit access to the area.	X			

163	Para 5.24	After bullet (c) may be added: (**d) volatility of the radionuclides discharges.**	This parameter is vital in the radionuclide's discharges.		X The text was modified as follows: "For properly evaluating the radiological impact of the discharges other <u>physical and chemical</u> parameters should be considered. Footnote: Such as, the physical and chemical form and solubility of the radionuclide(s) discharged; the particle size distribution in the case of airborne discharges; the pH in the case of water based liquid discharges; the temperature of the effluent and the volatility of the substances in the discharges.		The bullets were moved to a footnote as examples, and the paragraph was made generic as described.

164	Section 5.24	d) temperature e) specific conductivity f) total suspended solids	Include temperature, specific conductivity, and total suspended solids as other parameters that should be considered to evaluate the impact of discharges.		X The text was modified as follows: "For properly evaluating the radiological impact of the discharges other physical and chemical parameters should be considered. Footnote: Such as, the physical and chemical form and solubility of the radionuclide(s) discharged; the particle size distribution in the case of airborne discharges; the pH in the case of water based liquid discharges; the temperature of the effluent and the volatility of the substances in the discharges.		The text was modified to clarify that the parameters mentioned are those affecting the radiological impact. And the temperature of the effluent was included. Moreover, the bullets were moved to a footnote as examples, and the paragraph was made generic as described.
165	5.24. line 6	"considered"	Spelling	X			
166	5.24/6 (p.31)	Other parameters that should be consider → Other parameters that should be considered	Editorial.	X			
167	5.24 (line 6)	"Other parameters that should be considered for …"		X			
168	5.24	"Other parameters that should be ~~consider~~ considered for properly evaluating the impact of the discharges include the following"	Grammar	X			

169	5.24	~~(c) The pH in the case of water based liquid discharges~~.	It does not seem relevant for calculations.		X Text has been amended and the example physical and chemical properties put in a footnote		
170	5.25	In selecting the instrumentation for source monitoring, possible abnormal and unexpected releases should also be considered to ensure that the measurement range is sufficient and that ~~alarms~~ alarm levels are adequately set.	Clarification	X			
171	5.25	5.25. In selecting the instrumentation for source monitoring, possible abnormal ~~and unexpected~~ releases should also be considered to ensure that the measurement range is sufficient and that alarms levels are adequately set.	If something is unexpected it makes no sense to consider it. If it is considered, it is no longer unexpected.	X			
172	5.29	"Where there are several facilities or activities giving exposure to the same group of individuals, there ~~could be~~ is a need to select sampling locations from which the aggregate effect of all discharges can be assessed.	This need is definitive.			X	Environmental monitoring is not always used to evaluate aggregated impact from several facilities. In some situations, the cumulative assessment is done based on the results of source monitoring and modelling.
173	Section 5.30, Line 6 (Addition – See Bolded Text)	The monitoring programme for the source and the environment that were in place during operation of the facility should be re-evaluated **whenever dynamic changes in the site occur** to determine whether they remain appropriate.	Demolition of buildings causes significant variability in environmental pathways.	X			

174	Section 5.30, Line 7-8 (Last Sentence)	Any new arrangement for source and environmental monitoring should be discussed in the decommissioning plan and implemented as appropriate.	The source and environmental monitoring plan is typically documented in another license basis document.	X			
175	Section 5.31, Line 5 (Addition)	New Text Following "…extended area sources may emerge and should be considered." : The contamination control program should be modified to control sources during decommissioning and minimize extended or non-traditional sources.	Make sure there is appropriate contamination control to minimize or address discrete radioactive sources, spills from waste haul paths, etc.		X The text was modified as follows: "The objectives of source monitoring should be essentially the same as for the operational stage. When defining the source monitoring programmes during decommissioning, the possible changes of quantities, radionuclides composition and physicochemical characteristics of the releases should be considered, as well as the changes in the external radiation fields around the facility".		
176	p.33/4 (p 5.33)	o The following is suggested. (before) As the facility undergoes ~~~ levels as specified by the regulatory body. (after) As the facility undergoes ~~~ levels as specified or approved by the regulatory body.	o In my opinion, as for the discharge limits and so on, they have to be specified or approved by the regulatory body during the licensing process for decommissioning. So, it is recommended that the phrase be modified.	X			

177	5.34	Recommendations for monitoring in this stage are provided in IAEA Safety Standards Series No. WS-G-5.1,	The recommendations concerning the need of monitoring the environment affected by tailings from processing or radioactive waste disposal sites/repositories should also be mentioned here			X	Monitoring of radioactive waste disposal facilities is out of the scope of DS-505 (see para 1.22).
178	5.34	Prior to the release from regulatory control of source or of site, monitoring should be conducted to verify compliance with the authorized end state criteria. Recommendations for monitoring in this stage are provided in IAEA Safety Standards Series ~~No. WS-G-5.1~~DS542, Release of Sites from Regulatory Control on Termination of Practices [37].	What exactly is been released from regulatory control? Please clarify. We made a suggestion.	X			
179	p33 Annotation 15	decommission activities → decommissioning activities	Editorial.	X			
180	5.35	The results of source monitoring and environmental monitoring should be used to confirm that the dose to the public due to radioactive discharges during normal operation and for decommissioning comply with the appropriate dose limits and dose constraints.	Please include decommissioning as well.	X			

181	5.36	The calculation of doses on the basis of the results of environmental monitoring should be used when sufficient results of measurements of the activity concentration of radionuclides in air, water and foods are available to avoid significant statistical uncertainties. In many cases, only some of the discharged radionuclides can be measured above the detection limits16 in the relevant environmental media. The others can be computed through scaling factors. The calculation of doses from the results of environmental monitoring should therefore be complemented with calculations made on the basis of the results of annual discharges derived from source monitoring combined with environmental models.	Addition about the use of "scaling factors" for difficult to measure radionuclides		X The following text was added to the Footnote 17: "Alternatively, radionuclides concentrations that cannot be measured above the detection limits can be computed through scaling factors. It is an accepted practice to derive the activities from a fraction of the detection limit to refrain to add up to result in unrealistic estimation."		

182	5.36	Both measurement results above the detection limit and measurement results below the detection limits could be used for dose assessment purposes. However, it should be noted that, in the cases when measurements are below the detection limits, the use of detection limits as substitutive values might substantially overestimate the estimated dose. However, when doses from nuclides which activities are derived from detection limits add up to result in unrealistic estimation, it is an accepted practice to derive the activities from a fraction (e. g. ¼) of the detection limits	Addition of accepted practice		X The following text was added to the Footnote 17: "Alternatively, radionuclides concentrations that cannot be measured above the detection limits can be computed through scaling factors. It is an accepted practice to derive the activities from a fraction of the detection limit to refrain to add up to result in unrealistic estimation."		

183	Page 36 para 5.36	There is something illogical in these paragraphs. It is rightly mentioned that environmental measurements may not be sufficient to determine doses to the public due to detection limits that are too low. To overcome this difficulty, it is advisable to combine measurements with models. Later in the paragraph, it is indicated that the measurements must make it possible to verify that the models are relevant. This deserves more explanation because written like this it is very confusing			X		The text was modified as follows: "When sufficient results of measurements of the activity concentration of radionuclides in air, water and foods are available, the calculation of doses on the basis of ~~the results of environmental monitoring~~ ~~the~~ these measurements results should be preferable used to avoid significant statistical uncertainties. In many cases, only some of the discharged radionuclides can be measured above the detection limits[1] in the relevant environmental media. The calculation of doses from the results of environmental monitoring should therefore be complemented with calculations made on the basis of the results of annual discharges derived from source monitoring combined with environmental models.

[1] Both measurement results above the detection limit and measurement results below the detection limits could be used for dose assessment purposes. However, it should be noted that, in the cases when

184	Section 5.37	Data from environmental monitoring for the operational stage of a facility or activity can be used to verify compliance with **any applicable limits on the concentration in the environment**, dose limits and dose constraints.	Discharge limits are applied at the end of the source and not in the receiving environment where environmental monitoring samples are taken. Therefore, suggest replacing "discharge limits" with "any applicable limits on the concentration in the environment."		X The text was modified as follows: "Data from environmental monitoring for the operational stage of a facility or activity can be used **as an input** to verify compliance with ~~discharge limits~~, dose limits and dose constraints, **applicable derived limits on the radionuclide concentration in the environment**, and also to confirm that the environmental models, assumptions, and parameters used in the prospective assessment are adequate [2]."		

measurements are below the detection limits, the use of detection limits as substitutive values might substantially overestimate the estimated dose. Alternatively, radionuclides concentrations that cannot be measured above the detection limits can be computed through scaling factors. It is an accepted practice to derive the activities from a fraction of the detection limit to refrain to add up to result in unrealistic estimation.

185	5.37	~~When possible, the models used for the prospective radiological impact assessment should be validated through a comparison of the results predicted by environmental models with the actual data from measurements.~~ Data from environmental monitoring for the operational stage of a facility or activity can be used to verify the consistency with the results of ~~compliance with discharge limits, dose limits and dose constraints, and also to confirm that the~~ environmental models.~~, assumptions, and parameters used in the prospective assessment are adequate [2]~~. Please implement the same modification, as appropriate, in other relevant parts of the draft.	The document mentions the validation of models as another objective of the environmental monitoring. In practice results from environmental monitoring can be compared to results obtained from models, with the objective to verify the consistency with the results of the impact studies. On the contrary, validation of models should be based on specific experiments and specific data, which could not be collected by routine monitoring.			X	Results from environmental monitoring can be used to confirm that the environmental models used in dose assessment are adequate, and, with care, to validate the models used, if sufficient supporting information is collected with the monitoring results to use for model validation. See para 5.3 of GSG 10.
186	Page no 34 , Para 5.38, line no 4 & 6	The assessment of doses from external irradiation from the source within the facility using direct dose rate **measurements** is straightforward, at least in principle. The radiation fields in its vicinity may be measured or calculated using simple radiation detectors. **Additional** recommendations on dose assessment from monitoring results are provided in Section 9.	Editorial ▪ The word "measurments" may be corrected to "**measurements**" ▪ The word "Additonal" may be corrected to "**Additional"**	X			
187	5.38/4 (p.34)	measurments → measurements	Editorial.	X			

188	Para 5.39	**In the last bullet after** **"**Dose limits for members of the public" may be completed as **"-Dose limits for members of the public and for occupational exposure"**	Dose limits here have to be included public and occupational exposure.			X	Exposures (and doses) in the scope of this safety guide are those for the members of the public. Occupational exposure is out of the scope of this safety guide.
189	5.39 Bullet 3	Dose constraints for the facility, activity or **site**	The dose constraint may also be set for site.	X			
190	5.39 (line 2)	"… the actual radiation conditions with regulatory limits and constraints by comparison …"	Third bullet is: "Dose constraints for the facility or activity" and as "dose constraint" is not a limit, it is suggested to add "and constraints" to the sentence	X			
191	Page no 35 , Para 5.41, line no 4	The report should also include the **circumstances** of the release, the results of any additional monitoring and estimation of doses to the public from the event	Editorial The word "cicumstances" may be corrected to "**circumstances"**	X			
192	5.41 (line 4)	"The report should also include the circumstances of the"		X			

193	5.41 and 5.43	**5.41.** Discharge limits generally include a margin of flexibility to provide for operational variability and for anticipated operational occurrences [3]. ~~Whenever discharge limits have been exceeded, the operating organization is required to report promptly to the regulatory body (see para. 3.137(d) of GSR Part 3 [1]). The report should also include the cicumstances of the release, the results of any additional monitoring and estimation of doses to the public from the event.~~ **5.42.** Authorizations may also include environmental limits, such as radiation levels at the site boundary or limits on the concentrations of radionuclides or categories of radionuclides in specific environmental compartments. Data from environmental monitoring should be used to ensure that actual radiation levels and radionuclide concentrations are below these limits. **5.43.** The operating organization should report promptly to the regulatory body whenever discharge limits have been exceeded, (see para. 3.137(d) of GSR Part 3 [1]). The report should also include the circumstances of the release, the results of any additional monitoring and estimation of doses to the public from the event. Operating organizations should report promptly to the regulatory body a significant unexpected increase in environmental radiation fields or activity concentrations, or an unplanned release of a significant quantity of radionuclides. The report should include a description of the investigation that has been initiated, the preliminary results, the immediate actions that have been taken in relation to discharge operations (e.g. stopping batch discharges) and the actions that are anticipated for the immediate future (e.g. resuming discharge operations).	Part of the para 5.41 be transferred to the start of the para 5.43 (with very little modification) in order to keep the continuity of the subject (first talking about limits, then talking about reporting)	X			

(1) 194	Para: 5.44, Page :35, Line 4	In new text example of 'other data' may be included	To know about other data that are relevant to the dose assessment.	X			The following was included "such as meteorological".
195	5.44 line 3	This should include, as applicable, the results of dose assessment…	See para. 3.173 (c) of GSR Part 3	X			
196	Section 5.44	The operating organization is required to report the results of the monitoring programme for a facility or activity to the regulatory body **at a minimum once a year**.	Specify a reporting frequency that the operator must report monitoring results to the regulatory body.	X			
197	Subsection of Section 6	Monitoring in Situations of Chronic Exposure	Section 6 of RS-G-1.8 contains the monitoring of chronic exposure; such kind of monitoring is required for long term exposure in emergency exposure situations. Please include.			X	GSR Part 3 considers: Planned, Emergency and Existing exposure situations. DS-505 reviews RS-G-1.8, among other things, to adequate the terminology/approach to GSR part 3.
198	Subsection of Section 6	Dose Assessment in Situations of Chronic exposure	Section 8 of RS-G-1.8 contains the dose assessment in situations of chronic exposure; GSR part 7, mentioned the dose limitations of acute exposures. Please include.			X	GSR Part 3 considers: Planned, Emergency and Existing exposure situations. DS-505 reviews RS-G-1.8, among other things, to adequate the terminology/approach to GSR part 3.
199	Section 6 Section 7	We recommend to add a reference, *ICRP Publ.146 Radiological Protection of People and the Environment in the Event of a Large Nuclear Accident: Update of ICRP Publications 109 and 111*.	Usefulness.	X			

200	Paragraph 6		The section recommends reflecting that dose assessment involves not so much an assessment of effective radiation doses, but rather an assessment of the equivalent dose received by individual organs, as provided in GSR Part 3 (Annex A).			X	Doses, as mentioned in most parts of the document, relate to effective doses; there are a few parts in which equivalent doses are mentioned, particularly in the context of individual monitoring in emergencies, in addition to the effective dose.
201	Page.36 6.1.	…This should include the responsibilities fir monitoring in accordance with the possible radiological consequences of the ~~accident~~ emergency.	Editorial: For example, see para 4.8 of GSR Part 7: …, to prepare for and to deal with both radiological and non-radiological consequences of a nuclear or radiological emergency, …	X			
202	6.1	Monitoring concerns “accidental release” and the exposure deriving from a malicious act			X The text was modified as follows: “Monitoring during a nuclear or radiological emergency is a key tool to assess the impact on the public of ~~an accidental~~ a release of radioactive material..”		

203	6.1/ First paragraph/ Second line	"…to assess the impact of an accidental release of radioactive material on the public ~~of an accidental release~~ and assist in the …"	The definition of the term "release" in IAEA Safety and Security Glossary is general. Also paragraph 1.25 states: "This Safety Guide does not address monitoring of non-radiological contaminants…". So for clarification, it is suggested to add "radioactive material".		X The text was modified as follows: "to assess the impact on the public of ~~an accidental~~ a release of radioactive material and assist in the.."		
204	6.1/ Second line	"…and assist ~~in the implementation~~ to decide on or adjust the ~~of~~ protective actions and other response actions that have to be taken or that are being taken to…"	Not so agree with using the term "implementation". Paragraph 5.40 of GSR Part 7 states: "Within emergency planning zones and emergency planning distances, arrangements shall be made for the timely **monitoring and assessment of contamination, radioactive releases and exposures for the purpose of deciding on or adjusting the protective actions and other response actions that have to be taken or that are being taken**." Before taking protective actions, decision on perotective actions should be made.		X "The text modified as follows: "and assist ~~in the implementation~~ in the decision making or adjustment of protective actions to prevent or minimize the radiological consequences."		
205	6.1/ Last line	"…the possible radiological consequences of ~~the accident~~.a nulear or radiological emergency."	By using the term "a nuclear or radiological emergency", the sentence becomes more general, because the initiator may be a nuclear security event too.		X The text was modified as follows: "…the possible radiological consequences of the ~~accident~~ emergency."		
206	6.2	"information required" could be replaced by "information useful"		X			The paragraph was deleted.

207	6.2	Please delete the paragraph or make it clear.	This paragraph should be clarified. It is rewording of paragraph 6.1 but is not clear It is suggested to make this paragraph clear or delete it. Also paragraph 6.12 is about this subject.	X			The paragraph was deleted.
208	6.2	Rather than "to facilitate dose assessment for the protection of the public and the environment" we propose "to provide decision support in order to implement an heath care and follow-up for people"	Dose assessment is not strictly an aim but rather a tool to achieve different goals like protection of the public or health care and follow-up	X			This paragraph has been deleted as these aspects are picked up throughout Section 6 in more detail.
209	6.3	Monitoring during an emergency may be undertaken by different organizations (e.g. the operating organization, the regulatory body, ~~technical support organizations~~ response organizations).	Consistency with GSR Part 7. GSR Part 7 refers to response organizations, not technical support organizations		X The text was modified as follows: Monitoring during an emergency may be undertaken by different organizations (e.g. the operating organization, the regulatory body, the technical support organizations or the response organizations).		"Response organizations" was included, but "technical support organizations" was kept, as in some countries they can undertake emergency monitoring.
210	6.3	It could be included that monitoring in EmES do not start from scratch and compose also with elements available thanks to PES monitoring	Emergency monitoring also uses means and results of peacetime monitoring (locations, instruments, background level before accident…).	X			Additions were made in para 5.5 and para 5.22 to include the role of monitoring in normal operation in building capacity for emergency monitoring.

211	Page.36 6.4.	The monitoring strategy for an emergency exposure situation should be developed at the preparedness stage as part of the protection strategy to protect the public and emergency workers, and to provide information necessary to make decisions on protective actions17 and other response actions [5, 13, 38], which needs to be included in a part of the emergency plan, or to be issued as a standalone document, as appropriate. The monitoring strategy should be established on the basis of the hazard assessment whose performance is ensured by ~~that is the responsibility of~~ the government (see Requirement 4 of GSR part 7 [5]), which should be reassessed on the basis of the adjusted protection strategy throughout an emergency.	Clarification of the monitoring strategy in case of an emergency Also, GSR Part 7 does not mention that perform of hazard assessment is the responsibility of the government, which is required ensuring that hazard assessment is performed.		X The text was modified as follows: "The monitoring strategy for an emergency exposure situation should be developed at the preparedness stage as part of the protection strategy to protect the public, ~~and~~ emergency workers, and helpers, to provide information necessary to make decisions on protective actions and other response actions, which need to be included in the emergency plan, or issued as a standalone document, as appropriate. The monitoring strategy should be established on the basis of the radiological hazard assessment as requested by the government (see Requirement 4 of GSR part 7 [5]) and should be adjusted on the basis of the prevailing circumstances during the emergency."		

212	6.4 Line 4	… The monitoring strategy should be established on the basis of the radiological hazard assessment that is the responsibility of the government (see Requirement 4 of GSR part 7 [5]).	Clarification	X			
213	6.4/ Second and third line	"…preparedness stage as part of the protection strategy to protect the public, ~~**and**~~ emergency workers and helpers, and to…"	Please include "helpers" according to GSR Part 7 too. In the protection strategy, their protection should be considered.	X			
214	6.5	Depending on the severity of a nuclear or radiological emergency, all three types of radiation monitoring — source monitoring, environmental monitoring and individual monitoring — ~~could~~ should be performed~~,~~ in accordance with a graded approach.	Clarification.	X			

215	Page.37 6.7.	The government should ensure that a monitoring strategy for ~~each type~~ different phases of ~~the~~ an emergency ~~exposure situation~~ has been developed at the preparedness stage. ~~Each type of~~ The monitoring ~~strategy~~ strategies should take account of the resources required to undertake monitoring and should stipulate priorities for the different phases of the emergency18, in accordance with the protection strategy.	The wording of "each type of emergency exposure situation" is unclear.		X The text was modified as follows: "The government should ensure that a monitoring strategy ~~for each type of emergency exposure situation has been~~ is developed at the preparedness stage as part of the protection strategy, based on the hazards identified. ~~Each type of~~ The monitoring ~~s~~trategy should take account of the type of emergency, the resources required to undertake monitoring, and should stipulate priorities for the different phases of the emergency, in accordance with the protection strategy."		

216	6.7	The government should ensure that ~~a~~ monitoring strategies ~~for each type of emergency exposure situation~~ have been developed at the preparedness stage as part of the protection strategies, based on the hazards identified.	Consistency with GSR Part 7. The phrase 'each type of exposure situation' is not clear. Monitoring strategies are based on the hazard assessment, using a graded approach.		X Modified as follows: "The government should ensure that a monitoring strategy ~~for each type of emergency exposure situation has been~~ is developed at the preparedness stage as part of the protection strategy, based on the hazards identified. ~~Each type of~~ The monitoring ~~s~~trategy should take account of the type of emergency, the resources required to undertake monitoring, and should stipulate priorities for the different phases of the emergency, in accordance with the protection strategy."		The type of emergency here refers to the emergency classes as in GSR Part7, Para 5.14. The wording in GSR part 7 is as follows: "This shall include a system for classifying all types of nuclear or radiological emergency".

217	6.7	The government should ensure that **a monitoring strategy for an emergency exposure situation** has been developed at the preparedness stage. **The monitoring strategy** should take account of **the type of emergency,** the resources required to undertake monitoring**,** and should stipulate priorities for the different phases of the emergency, in according with the protection strategy.	Consider adjusting the text for clarity. It is either an emergency exposure situation or not. However, the emergencies causing the emergency exposure situation can be different (e.g. radiological or nuclear). In paragraphs 6.4 and 6.6 one monitoring strategy ("The monitoring strategy") is mentioned. The single strategy should thus be applicable to different scenarios, as described in GSR Part 7 5.82.		X Modified as follows: "The government should ensure that a monitoring strategy ~~for each type of emergency exposure situation has been~~ is developed at the preparedness stage as part of the protection strategy, based on the hazards identified. ~~Each type of~~ The monitoring ~~s~~trategy should take account of the type of emergency, the resources required to undertake monitoring, and should stipulate priorities for the different phases of the emergency, in accordance with the protection strategy."		

218	6.7/ First and second lines	"The government should ensure that a monitoring strategy for each type of ~~emergency exposure situation~~ nuclear or radiological emergency has been…"	Emergency exposure situation is a type of exposure situation. But no reference could be found about types of emergency exposure situation. Please consider paragraph 5.14 of GSR Part 7 that classifies all types of nuclear or radiological emergencies.		X Modified as follows: "The government should ensure that a monitoring strategy ~~for each type of emergency exposure situation has been~~ is developed at the preparedness stage as part of the protection strategy, based on the hazards identified. ~~Each type of~~ The monitoring ~~s~~trategy should take account of the type of emergency, the resources required to undertake monitoring, and should stipulate priorities for the different phases of the emergency, in accordance with the protection strategy."		

219	6.7 Footnote 19 (Footnote 27)	19 Competent authority is "any ~~body~~ entity or authority designated or otherwise recognized as such for any purpose in connection with regulation". Although the term is generally applicable in the context of transport regulations, it is used here to indicate that in an emergency situation the responsible ~~is not necessarily the regulatory body but~~ could be any competent organization indicated by the government [4].	There are few States where the regulator will take the lead of the emergency response.		X "any body or authority designated or otherwise recognized as such for any purpose in connection with regulation". Although the term is generally applicable in the context of transport regulations, it is used here to indicate that in an emergency situation the responsible ~~is not necessarily the regulatory body but~~ could be any competent organization indicated by the government"		The sentence between quotation markers is a quotation from the IAEA Safety Glossary; therefore, the word 'body' was kept.
220	Page.36 6.8.	The regulatory body or other competent authorities[19] should ensure that arrangements for monitoring on the site and its vicinity during an emergency are established by the operating organization and are routinely tested. This should include ensuring the capability for rapid monitoring ~~under~~ during an emergency ~~conditions~~.	Clarification: The scope of the monitoring by the operating organization should be clarified to be consistency with the next paragraph.	X			

221	6.8 (p.37), 6.20 (p.40)	Please add description on “emergency conditions” so that readers can understand how it is different from “emergency”.	Clarification.		X The text was modified as follows: “The regulatory body or other competent authorities should ensure that arrangements for monitoring on the site and its vicinity during an emergency are established by the operating organization and are routinely tested. This should include ensuring the capability for rapid monitoring ~~under~~ during an emergency ~~conditions.~~”		
222	6.9	The operating organization should establish and maintain an adequate capability to carry out monitoring on the site and its vicinity for which a license is ~~warranted~~ issued, in accordance with an emergency plan approved by the regulatory body.	Clarification.	X			

223	6.10	The government is required to ensure that there is coordination between all the organizations involved in emergency preparedness and response (see Requirement 22 of GSR Part 7 [5]). This should include identifying or establishing a ~~governmental organization~~ coordinating mechanism responsible for the coordination of all the monitoring activities involved in emergency preparedness and response.	Consistency with GSR Part 7. GSR Part 7, 6.13 states that "arrangements for coordination shall be put in place", but does not specify that this would the responsibility of a single governmental organization, as this may not be achievable for emergency situations depending on national legislation.		X The text was modified as follows: "This should include ~~identifying or~~ establishing a ~~governmental organization~~ coordinating mechanism to identify responsible organizations and ~~responsible for the~~ coordinat~~ion of~~ all the monitoring activities involved in emergency preparedness and response."		
224	6.12	Guide decision makers on the need to take protective actions and other response actions ~~mainly on the basis of defined operational criteria~~	The use of operational criteria (OILs and EALs) should not be part of the objectives for monitoring. They aid in the interpretation of monitoring results. Operational criteria are also referred to elsewhere, e.g. 6.21, where a reference to the technical information could be included. Suggest to remove the last part of the sentence, concerning OILs:	X			
225	6.12 b	"Assess doses" could be replaced by "Contribute to dose assessments"	Monitoring results might not be sufficient to assess doses.	X			
226	6.12 d	"Confirm the efficiency of" could be replaced by "Provide information on the efficiency of".		X			

227	6.12 (d)	"Confirm the ~~efficiency~~ efficacy of the protection strategy."	Confirming the efficacy of the protection strategy is more important than its efficiency.	X			
228	6.12/ Last paragraph (bullet (g))	"Facilitate the coordination ~~**of**~~ and consistency of…"	Editorial comment	X			
229	6.13	Decisions regarding the urgent protective actions to be taken in the event of a nuclear or radiological emergency depend on the prevailing conditions at the facility or on the environmental monitoring. ~~In addition,~~ ~~s~~Source monitoring should be conducted to provide information for emergency classification and facilitate the assessment of the magnitude of radiological hazard and possible development of conditions throughout a nuclear or radiological emergency in order to promptly initiate an effective response and revise the protection strategy, as appropriate. Source monitoring is also particularly helpful to obtain information for the estimation of the actual source term and to assist the implementation of environmental monitoring.	In addition to what? We suggest to delete. Please specify that radiological hazard is meant here, as there might be a number of different hazards in case of nuclear or radiological emergency.	X			

230	6.13	Source monitoring ~~is also particularly helpful~~ **can be used** to obtain information for the estimation of the ~~actual~~ source term **or activity of the source** and to assist the implementation of environmental monitoring.	It is important to recognize that the source term will be difficult to assess based on source monitoring and that the source term is likely to be discussed for a long time after the emergency. Please also consider other types of emergencies, e.g. a transport accident involving a radioactive source. Source monitoring may then also refer to monitoring of for example dose rate to estimate the activity of the source. This could be clarified in the paragraph. C.f. the definition in 3.11. Suggest to adjust the text accordingly.		Text was modified as follows: X "Source monitoring ~~is also particularly helpful~~ **can be used** to obtain information for the estimation of the ~~actual~~ source term and to assist the implementation of environmental monitoring."		Emergencies involving the transport of radioactive material are out of the scope of this safety guide, as stated in 1.17. Therefore, the second suggestion (to include 'or activity of the source') was not included in the text.
231	6.13 Footnote 21 (Footnote 29)	To be corrected or removed	The footnote currently states "Emergency classification using monitoring data is based on emergency action levels (EALs)" which is not accurate. The classification is to be made based on the hazard assessment. While EAL are the basis for classification (in particular for nuclear emergencies) it should be considered that EALs are "specific, predetermined criterion for observable conditions used to detect, recognize and determine the emergency class" which is way broader that monitoring only.		X Text was modified as follows: "When monitoring data is used to emergency classification, emergency action levels (EALs) are the basis."		The sentence does not state that classification is only based on EALs, but that when emergency classification uses monitoring data, it is based on emergency action levels. The text was modified for clarity.

232	6.13/ whole paragraph specially Lines 3 and 4	Please clarify this paragraph by providing references in the text, especially for conducting source monitoring to provide information for emergency classification.	It is suggested to clarify this paragraph by providing the references in the text. For example provide the reference for lines 3 and 4, in the text, which states source monitoring should be done for emergency classification. The reference could not be found. Paragraph 4.2 of GS-G-2.1 states: "**Furthermore, the Requirements [2] (para. 4.20) require that the criteria for classification be "predefined emergency action levels (EALs) that relate to abnormal conditions for the facility or practice concerned, security related concerns, releases of radioactive material, environmental measurements and other observable indications.**"		X The text was modified as followed: "Decisions regarding the urgent protective actions to be taken in the event of a nuclear or radiological emergency depend on the prevailing conditions at the facility or on the results of environmental monitoring. ~~In addition~~ Source monitoring should be conducted to provide information for emergency classification and facilitate the assessment of the magnitude of radiological hazard and possible development of conditions throughout a nuclear or radiological emergency, in order to promptly initiate an effective response and revise the protection strategy, as appropriate. Source monitoring ~~is also particularly~~ can be used to obtain information for the estimation of the ~~actual~~ source term and to assist the implementation of environmental monitoring.		In the mentioned paragraph (4.2 of GS-G-2.1) releases of radioactive material is one of the factors that relates to the criteria for emergency classification. Source monitoring provides information on the releases of radioactive material. GS-G-2.1 [Ref 14] was included as a reference in this paragraph.

233	6.14	For facilities that might experience an accidental release that could ~~warrant~~ require urgent protective actions, early protective actions or other response actions, a continuous or batch monitoring system, able to measure the potential range of activity concentrations, should be established at all potential release points, such as stacks and discharge points of radioactive liquid effluents. Additional technical information about source monitoring in emergency exposure situations is provided in Ref. [42]. For nuclear power plants event sequences that could result in high radiation doses or in a large radioactive release have to be 'practically eliminated', see DS508	We believe "require" fits better. Please incorporate a statement on "practical elimination".		X "Warrant" was replaced by "require", as suggested		Regarding the additional statement proposed for the end of the paragraph, we consider it is not related to monitoring but to the design of nuclear power plants. Moreover, emergency exposure situations could be the result of accidents beyond design basis.
234	6.15	The arrangements for source monitoring should consider that for certain accidents, further releases may occur through different locations (e.g. due to building leaks). For such cases, the source monitoring arrangements should include means to urgently deploy special monitoring equipment. In such cases, information related to source terms can also be derived from other measurement devices on site or at the boundaries of the facility.	We guess that this is information related to source terms which can be derived in such a way, not the source terms themselves. Please verify.	X			

235	6.16	6.16. Environmental monitoring should provide information on the need and extent of protective actions and other response actions, and facilitate the following: (a) Characterization ~~Calculation~~ of the source; (b) Assessment of doses to members of the public, facility operating personnel ~~personal~~, emergency workers and helpers; (c) Assessment of risks of health effects and provide information to identify needs for individual monitoring; (d) Confirm if the urgent protective actions implemented, such as evacuation, sheltering, relocation, iodine thyroid blocking, are appropriate.	Clarification. Source is not to be calculated. The phrase "personal" should be replaced by "personnel" because the sentence (b) states about assessment of doses to those who are engaged in facility operation.		X		The word "term" was missing in bullet (a). The sentence should be "Calculation of the source term". Operating personnel has been deleted from the bullet (b), which was moved to bullet (d).
236	6.16 (a)	Calculation of the source term;		X			
237	Page. 39 6.16	(a) Calculation of the source;	It is not clear. Clarification is needed.	X			The word "term" was missing in bullet (a). The sentence should be "Calculation of the source term"
238	6.16/ Bullet (a)	Please clarify: "(a) Calculation of the source;"	It is not clear what should be the "calculation of the source".	X			The word "term" was missing in bullet (a). The sentence should be "Calculation of the source term"

239	6.16 (b)	Assessment of doses to members of the public, facility operating ~~personal~~ personnel, emergency workers and helpers;	Clarification.	X			Operating personnel has been deleted from the bullet (b), which was moved to bullet (d).
240	Page.39 6.16.	(d) Confirm if urgent and early-protective actions implemented, such as evacuation, sheltering, relocation, iodine thyroid blocking, are appropriate.	Relocation is early protective action.	X			
241	6.16 (d)	~~Confirm~~ Confirmation if the urgent protective actions implemented, such as evacuation, sheltering, relocation, iodine thyroid blocking, are appropriate.	Editorial.	X			
242	6.16	(d) …, such as ~~evacuation, sheltering,~~ relocation, ~~iodine thyroid blocking~~ are appropriate	Decisions on ITB/evacuation/sheltering should be taken based on plant conditions and the emergency class, preferably before the release occurs. Suggest removing the urgent protective actions from the list of examples.		X The text was modified as follows: "Confirmation whether the urgent and early protective actions implemented, such as evacuation, sheltering, relocation, iodine thyroid blocking, are appropriate."		

243	6.16	New text: (e) Identification of areas in which urgent or early protective actions or other response actions need to be implemented.	A bullet on the implementation of protective actions is missing. This is important, especially in the early phase of an emergency, where protective actions are mainly implemented based on monitoring results. Suggested text has language aligned with 7.10 (c) "To identify areas in which remedial actions or protective actions are justified;"	X			Bullet (a) has been added with the proposed text.
244	6.16		Consider also the order of the bullets. Based on the urgency and public impact, we suggest that bullet(s) regarding protective actions and other response actions should come first.	X			
245	Para 6.16	(b) Assessment of doses to members of the public~~, facility operating personal~~, emergency workers and helpers; (c) ~~Assessment of risks of health effects and~~ provide information to identify needs for individual monitoring;	It is proposed to exclude operational personnel from listing "b", since according to the definition (see paragraph 3.12 of the safety guide), environmental monitoring is carried out only outside the nuclear facility site. It is proposed to exclude health risk assessment from listing "c" as an excessive recommendation.	X			
246	Footnote 22 line 2 (link with 6.17)	"and it could be difficult"	"it" is missing.	X			

247	6.17	Depending on the duration of the release[22] , environmental monitoring may include measurements of dose rates and the sampling of radionuclides from the plume to compare with operational criteria for emergency preparedness and response (see GSR Part 7).	Please clarify what are the operational criteria here.	X			

248	Page.40 6.18.	During and immediately after the onset of a nuclear or radiological emergency, dedicated monitoring resources could be insufficient, particularly in a severe nuclear accident. The available resources should be utilized as effectively and efficiently as possible, in a timely manner, by setting priorities considering the population density and land use in the emergency planning zones and distances and also available infrastructure on the basis of prevailing conditions. It might be necessary to request support from other organizations including those for which monitoring is not their normal responsibility. At the development of the monitoring strategy, the suitable infrastructure should be selected based on the measurable values for each operational criteria considering the exposure pathways of radionuclide. The monitoring strategy should anticipate such situations and, when necessary, include pre-signed agreements and training.	Clarification of the monitoring strategy in case of an emergency		X The text was modified as follows: "During and immediately after the onset of a nuclear or radiological emergency, ~~dedicated~~ the available monitoring resources could be insufficient to cover all the monitoring needs, particularly in a severe nuclear accident. The available resources should be utilized as effectively and efficiently as possible, in a timely manner, by setting priorities considering characteristics such as the population distribution and land use in the emergency planning zones, the distances involved and the available infrastructure, on the bases of the prevailing conditions. It might be necessary to request support from other organizations including those for which monitoring is not their normal responsibility. The monitoring strategy should anticipate such situations and, when necessary, include pre-signed agreements and training."		The second sentence suggested was not included as it relates to the design of monitoring programmes and is too detailed for this section.

249	6.18	"dedicated monitoring resources could be insufficient" for achieving which target ? Or simply indicate that "mobilizable monitoring resources are by nature limited in number so they should be utilized efficiently" etc.			X The text was modified as follows: During and immediately after the onset of a nuclear or radiological emergency, ~~dedicated~~ the available monitoring resources could be insufficient to cover all the monitoring needs, particularly in a severe nuclear accident.		
250	6.20	For facilities that ~~could~~ should warrant urgent protective actions or early protective actions and other response actions, environmental monitoring systems, consisting of fixed remote stations at designated locations and mobile resources for environmental monitoring under emergency conditions should be established and deployed in accordance with the provisions included in the emergency plan. Additionally, for nuclear power plants event sequences that could result in high radiation doses or in a large radioactive release have to be 'practically eliminated', see DS508	Please clarify, that facilities must warrant urgent or early protective actions. From other site, for nuclear power plants situations with early radioactive release or with large radioactive release have to be 'practically eliminated': please put in line with SSR-2/1 (Rev. 1) and DS508.		X		"Could' was replaced by "should", as suggested. Regarding the statement, we consider that it is not related to monitoring but to the design of nuclear power plants.

251	6.21		Consider referring to OIL EPR-series publications here (see comment on 6.12 above). The paragraph is one long sentence. Suggest splitting it into shorter sentences for readability and clarity.	X			

252	6.23	6.23. In establishing the individual monitoring strategy, it should be considered that measurements of external exposure of members of the public are effective only ~~technically feasible~~ if the dose rate in the area significantly exceeds the natural background level, for example three times. Selected representative members of the public may be provided with individual dosimeters and receive instructions on their use.	Clarification. It is technically possible to measure the external dose even if the measurement is ineffective.		X The text was modified as follows: "In establishing the individual monitoring strategy, it should be considered that the interpretation of measurements of external exposure of members of the public may be difficult as the dose may fall within the range of the variation of the natural radiation background level . Therefore, individual monitoring of the external dose rate ~~are~~ is only ~~technically feasible~~ effective if the dose rate in the area significantly exceeds the natural background level, ~~for example three times~~. Selected representative members of the public may be provided with individual dosimeters and receive instructions on their use."		

253	6.23	In establishing the individual monitoring strategy, it should be considered that measurements of external exposure of members of the public become less accurate when the dose rate does not sufficiently exceed background radiation levels. ~~are only technically feasible if the dose rate in the area significantly exceeds the natural background level, for example three times~~	Provides more generalized language. The 3x background can be misinterpreted as an effectiveness measure when useful information can be obtained at levels less than this.		X The text was modified as follows: "In establishing the individual monitoring strategy, it should be considered that the interpretation of measurements of external exposure of members of the public may be difficult as the dose may fall within the range of the variation of the natural radiation background level . Therefore, individual monitoring of the external dose rate ~~are~~ is only ~~technically feasible~~ effective if the dose rate in the area significantly exceeds the natural background level, ~~for example three times~~. Selected representative members of the public may be provided with individual dosimeters and receive instructions on their use."		

254	6.23	In establishing the individual monitoring strategy, it should be considered that measurements of external exposure of members of the public are only technically feasible if the dose rate in the area significantly exceeds the natural background level, *for example three times*. Selected representative members of the public may be provided with individual dosimeters and receive instructions on their use.	Why three times, do we have any reference to this? Please specify.		X The text was modified as follows: "In establishing the individual monitoring strategy, it should be considered that the interpretation of measurements of external exposure of members of the public may be difficult as the dose may fall within the range of the variation of the natural radiation background level . Therefore, individual monitoring of the external dose rate ~~are~~ is only ~~technically feasible~~ effective if the dose rate in the area significantly exceeds the natural background level, ~~for example three times~~. Selected representative members of the public may be provided with individual dosimeters and receive instructions on their use."		

255	6.23	We do not see the point of the first sentence.	Individual monitoring can be implemented in areas far from the contaminated territories, for example where people have been evacuated.		X The text was modified as follows: "In establishing the individual monitoring strategy, it should be considered that the interpretation of measurements of external exposure of members of the public may be difficult as the dose may fall within the range of the variation of the natural radiation background level . Therefore, individual monitoring of the external dose rate ~~are~~ is only ~~technically feasible~~ effective if the dose rate in the area significantly exceeds the natural background level, ~~for example three times~~. Selected representative members of the public may be provided with individual dosimeters and receive instructions on their use."		

256	6.23	In establishing the individual monitoring strategy, it should be considered that measurements of external exposure of members of the public are only technically feasible if the dose rate in the area significantly exceeds the natural background level~~, for example three times~~. Selected representative members of the public may be provided with individual dosimeters and receive instructions on their use.	There is no official basis for this.	X			
257	Page no 41 , Para 6.24, line no 4 & 5	Measurements of iodine **isotopes** in the thyroid, other gamma emitters (such as cobalt and caesium isotopes), beta **emitters** (such as tritium and strontium-90) and alpha emitters (such as radium, uranium and plutonium isotopes) should be considered in accordance with the radiological characteristics of the emergency.	Editorial ▪ The word “isopotes” may be corrected to “isotopes” ▪ The word “emmiters” may be corrected to **“emitters”**	X			

258	6.24	6.24. Measurements of quantities of radionuclides incorporated or deposited on individuals should provide input for the assessment of the committed dose and may help to reassure members of the public, for example, who have been evacuated. Measurements of iodine isotopes ~~isopotes~~ in the thyroid, other gamma emitters (such as cobalt and caesium isotopes), beta emitters ~~emmiters~~ (such as tritium and strontium-90) and alpha emitters (such as radium, uranium and plutonium isotopes) should be considered in accordance with the radiological characteristics of the emergency [23].	Editorial (typo)	X			
259	6.24 line 4	"isotopes"	Spelling	X			
260	Page 48 para 6.24	Isopotes should be isotopes		X			
261	6.24	"isopotes" -> "isotopes"		X			

262	Para 6.25 Line No. 3	Taking information about existing medical conditions in their families and hereditary conditions so as not to affect the results, being a preexisting medical conditions, or as a result of exposure.	Results of individual monitoring and related information should be carefully managed since they contain personal information should be clearly specified in the draft safety guide.			X	This level of details is not appropriated for a general safety guide. The careful management of personal information is already stated in para 6.25 (moved to 9.5).
263	6.25 and 6.26	6.25 and 6.26 should move up to before 6.22.	Before talking about how to monitor individuals, it is important to get their consent and to address the short-lived isotopes first.	X			Paragraphs 6.25 and 6.26 were rearranged in the text.
264	6.25	"contain personal and health related information"	Results of individual monitoring may also be covered by medical secret	X			Sentence moved to para 9.5.
265	Para 6.25	Permission should be sought from each person **(legal representative of person)** before performing individual measurements, and the nature and purpose of the measurements, and the planned use and protection of the information obtained, should be explained to the persons that are monitored.	It is proposed to supplement the paragraph with the need to accept permission to conduct individual measurements from a legal representative of the person (for example, in the case of minor children).	X			Sentence moved to para 6.21
266	6.26	Merging with 6.24	Consideration on the monitoring of ^{131}I refers to the characteristics of the accident	X			
267	6.26	Beyond this we think that the principle of prioritization and efficiency of use of the measurement means addressed in 6.18 for environmental purpose also applies for individuals.		X			A sentence was included in para 6.21 to reflect the principles of prioritization and efficiency.

268	6.27		In addition to ICRP 119, consider adding a reference to ICRP Publication 144 for dose coefficients for external exposure.	X			
269	6.27-6.28		Please clarify if and how monitoring results should be used to calculate doses to representative persons in order to be able to use the reference level as a benchmark during emergency response. The use of representative person in dose assessment is mentioned e.g. in paragraphs 7.22 and 9.11-9.15, but not here.	X			A paragraph related to the identification of the representative person was included in section 6. The recommendations provided in 9.15-9.18 apply for emergencies unless otherwise specified.
270	6.29	Monitoring data should be interpreted and presented to the regulatory body, response organizations and other governmental organizations	Consistency with GSR Part 7.		X The text was modified as follows: "Monitoring data should be interpreted and presented to ~~the regulatory body and other~~ governmental organizations…"		
271	6.29	"…presented to ~~the regulatory body and other~~ governmental organizations…"	Suggest to focus on decision makers (in governmental organizations) in general in the first sentence. National arrangements concerning decisions on e.g. protective actions differ between Member states. Different actors are involved depending on the type of monitoring.	X			

272	6.29	…provided in Ref. [44].	Footnote 25 should refer to reference [44]	X			The reference numbering has changed, but footnote is referring to the correct reference now.
273	6.29	~~A centralized s~~**Systems** to collect … , should be developed, **as appropriate**.	Suggest also to rephrase the last sentence to acknowledge that there can be different systems for different types of monitoring.	X			
274	6.29/5 (p.42)	The monitoring results and related analysis from different organizations (at local, national and international levels) conducting monitoring ~~should~~ is preferable to be presented in a pre-arranged compatible format[25].	Too prescriptive.	X			
275	6.29	More emphasis should be placed on the development of a centralized system to collect all the results of individual monitoring, which is a very important stake in a monitoring strategy to ensure traceability of individual results and reliable health follow up.				X	The level of detail in relation to the systems to manage information is considered adequate for a general safety guide. Additional information can be found in ref 45 (EPR Harmonization).

276	6.30	The government is required to ensure that arrangements are in place to provide the public with information that is necessary for their protection (see Requirement 10 and 13 of GSR part 7 [5]). This should include arrangements for the regulatory body or other response organizations to promptly provide the public with clear information based on the results of monitoring and additional analysis and interpretation. The information should include understandable interpretations in terms of health risks and advice on protective actions and other response actions.	Consistency with GSR Part 7. GSR Part 7 Req 10 or Req 13 doe not assign this role to the regulatory body, as there may be other response organizations responsible for this, such as health ministries. (for example Req 10, 5.48 refers explicitly to response organizations)	X			

277	6.30	The government is required to ensure that arrangements are in place to provide the public with information that is necessary for their protection (see Requirement 10 of GSR part 7 [5]). This should include arrangements for the ~~regulatory body~~respective entity ~~–~~to promptly provide the public with clear information based on the results of monitoring and additional analysis and interpretation. The information should include understandable interpretations in terms of health risks and advice on protective actions and other response actions. Refer to? IAEA Safety Standards Series No. GSG-14, Arrangements for Public Communication in Preparedness and Response for a Nuclear or Radiological Emergency provides further recommendations [45].	Such role is not necessarily with the regulator. About the second suggestion is to provide clarity to the sentence.		X The text was modified as follows: "This should include arrangements for the regulatory body or other response organizations to promptly provide the public with clear information based on the results of monitoring and additional analysis and interpretation. The information should include understandable interpretations in terms of health risks and advice on protective actions and other response actions. Further recommendations on Arrangements for Public Communication in Preparedness and Response for a Nuclear or Radiological Emergency are given in IAEA Safety Standards Series No. GSG-14.		

278	6.31/3, 4 (p.43)	The State where the emergency occurred should arrange with the States concerned the means for exchange of information and consultations, as appropriate. → The State where the emergency occurred should provide such information to the States concerned using the means for exchange of information and consultations, as appropriate.	Since Para 6.6 already describes arrangement of information exchange route, this paragraph is better to focus on the usage of such tool.	X			
279	6.31	When the results of monitoring programmes indicate that the information is relevant outside national boundaries, this information should be shared with the States concerned in accordance with the Early Notification Convention. [Delete footnote 26]	Reference to the Early Notification Convention is warranted in the text itself and should not be relegated to a footnote.		X		The sentence was added to the main text, but the footnote was kept. This was added as a footnote for editorial reasons. We cannot use a website as a reference in the IAEA safety standards, so adding it in a footnote is the only way of referring to the Early Notification Convention.
280	6.3	State responsibility is twofold. The level of local authorities in the facility area. national level.	Monitoring during an emergency may be undertaken by different organizations (e.g. the operating organization, the regulatory body, technical support organizations		X		The responsibilities for monitoring in an emergency exposure situation are covered in 6.6-6.10. Some modifications were made in these paragraphs for clarity and consistence. The same in Table 1.

281	Sections 5 , 6, and 7	Source and environmental monitoring are the same for any situation. The only differences are the reasons we monitor and the varied actions we can take based on those measurements. Is there a way to place monitoring in one location to reduce redundancies and to highlight the differences in a planned, emergency and existing exposure situation? Since Monitoring is discussed in Section 8, Sections 5, 6, and 7 should be streamlined.	To reduce redundancies and duplications thereby focusing on the differences with a planned, emergency and existing exposure situation.		X		The safety guide was elaborated with the intention of avoid repetition and simplify as much as possible sections 5, 6 and 7, although sometime this is challenging. We consider that the sections 5, 6 and 7 are concise and address the particularities of each exposure situation. For instance, monitoring in planned exposure situations must consider the different stages on the lifetime, which is not applicable to emergencies and existing exposures. On the other hand, monitoring in emergencies applies a different logic, and includes individual monitoring. Source monitoring in existing exposures is not straightforward. Some modifications were made to the text towards conciseness.

282	7.X	No Paragraph nor Alinea dedicated to individual monitoring in ExES especially after a radiological or nuclear accident or a malicious act ?		X			Paragraphs 7.6, 7.23 and 7.24, on individual monitoring in existing exposure situations, were included, and a number of amendments were made throughout the text.
283	7.1	Monitoring programmes for the existing exposure situations addressed in this Safety Guide include those for sites with residual radioactive material as a result of past activities that were not subject to effective regulatory control~~,~~ and areas with residual contamination as a consequence of a nuclear or radiological emergency.	Clarification.	X			
284	Para 7.7, Page :45, Line-1	The following sentence may require to be revised: Where an existing exposure situation results from a practice where the operating organization has been identified, this organization should have the responsibility to assess and manage that situation, including performing the appropriate monitoring	To understand the appropriate meaning of the sentence	X			The text was modified as follows: "Where the operating organization from a past practice which resulted in an existing exposure situation has been identified, this organization should have the responsibility to assess and manage that situation, including performing the appropriate monitoring."
285	7.7	Both terms are used, practice and activity; if they are synonymous, please make this clear.	Where an existing exposure situation results from a practice / activity where the operating organization has been identified,…	X			A footnote was included in 5.3.

286	7.7/1 (p.45)	results from → resulting from	Editorial.	X			This paragraph was rephrased.
287	7.10	(e) To evaluate and verify the effectiveness of remedial actions, and as relevant, other protective actions; (f) To detect changes and evaluate long term trends in radiological conditions in the environment as a result of natural processes and human activities, including remedial actions; (g) To provide information to build trust with and for the reassurance of interested parties, including local communities and members of the public. (h) To provide information to support decisions related to release of contaminated land from regulatory control and application of restrictions and institutional controls, as relevant.	Incorrect alphabetical ordering	X			
288	Page no 46 , Para 7.10, bulleting	Bulleting given in the section is not correct after bullet (d) and the same should be corrected as (e), (f), (g), and (h) subsequently.	Bulleting need to be corrected after bullet (d)	X			
289	7.10 (p.46)	~~(a)~~(e) To evaluate and verify the effectiveness of remedial actions, and as relevant, other protective actions; ~~(e)~~(f) ... ~~(f)~~(g) ... ~~(b)~~(h) ...	Editorial. Sequence is out of alignment.	X			

290	7.10	Mistake in numerotation of alineas a, b, …		X			

291	Section 7.14, Line 3-7 (Deletion)	Delete: "Changes in exposure pathways, for example, in cases where remedial actions alter the structure of the environment are taken (e.g., remedial actions involving tree removal, excavation, blasting, diversion of water courses) or where groundwater contamination reaches surface waters, should be taken into account in the monitoring programmes.	The sentence is confusing and hard to apply.		X The text is modified as follows: 'To develop an effective environmental monitoring programme for sites or areas with residual radioactive material, the most significant exposure pathways should be characterized ~~to identify whether or not they are likely to evolve rapidly~~ and <u>any likely changes in their significance in the future identified</u>. Changes in the <u>most significant</u> exposure pathways, for example, in cases where remedial actions alter the ~~structure~~ <u>distribution of radionuclides in the</u> environment ~~are taken~~ (e.g. ~~remedial actions involving~~ tree removal, excavation, blasting, diversion of water courses) or where groundwater contamination reaches surface waters <u>over a period of time</u>, should be taken into account in the monitoring programmes.'		The text was modified to make it clearer, but it should be kept as it is an important aspect in certain exposure situations, especially those involving remediation.

292	7.17	New para: “Areas may have residual contamination as a consequence of a nuclear or radiological emergency. In such cases, the monitoring conducted and the protective actions implemented during the emergency response should be taken into account in the development of the monitoring programme for the existing exposure situation.”	Suggest a new paragraph after 7.17 highlighting the need to take monitoring results from the emergency response (emergency exposure situation) into account, should such results exist. 7.17 mentions large areas to be surveyed, but in this situation, the areas with residual contamination are likely to have been surveyed already.		X Text was included as follows: “In areas with residual contamination as a consequence of a nuclear or radiological emergency, the monitoring conducted, and the protective actions implemented during the emergency response should be taken into account in the development of the monitoring programme for the existing exposure situation.”		The addition was made to the para 7.2 instead, as the statement is general and not only applicable to external exposure.
293	7.19/7 (p.48)	such us → such as	Editorial.	X			
294	7.19	“In areas with residual radioactive material, the inhalation of resuspended radionuclides from the ground ~~can cause a significant~~ **may cause** exposure.”	Suggest a change of words or to add a reference to the statement that resuspension can cause “significant exposure”. According to the UNSCEAR 2020/2021 Report, Volume II, Scientific Annex B, paragraph 30: “ *…, all of these studies have confirmed that resuspension did not significantly contribute to the long-term exposure of the public*.”	X			

295	Para 7.20		The paragraph states that drinking water should be controlled only if the source of drinking water is located in a contaminated area. However, the possibility of migration of radionuclides through the aquifer has not been taken into account.	X			The text was modified as follows: "Drinking water should also be monitored if a source of drinking water is present in the contaminated area or could be contaminated by migration of radionuclides".
296	7.21	7.21. In areas with significant radioactive contamination, ~~particularly naturally occurring radionuclides,~~ radionuclide activity concentrations in environmental matrices should be measured at an adequate sampling frequency to establish whether the activity concentrations comply with the reference levels established for the existing exposure situation (see paras 5.2, 5.4, 5.8 and 5.9 of GSR Part 3 [1]).	Clarification. The reason why naturally occurring radionuclides were specifically mentioned should be described for better understanding. Otherwise, this part should be deleted from the sentence.	X			
297	Page no 49 , Para 7.22, line 8	In sites with highly **heterogeneous** contamination, the dose assessment could also consider potential exposures	Editorial The word "heterogenous" may be corrected to **"heterogeneous"**	X			

298	Para 7.22		In the paragraph, it is recommended to clarify what heterogeneity is **high** (for example, indicate a numerical criterion in the form of a footnote).		X The heterogeneity is rather qualitative; therefore, it is not possible to provide a numerical criterion. Footnote 35 gives an example of such cases, which is when there is the presence of discrete particles. The word "radioactive" was included before "particles" for clarification.		
299	Page no 50 , Para 7.24, line no 3	**Additional** recommendations on undertaking dose assessment from monitoring results are provided in Section 9.	Editorial The word "Additonal" may be corrected to "Additional"	X			
300	Para 7.25		It is proposed to clarify in the paragraph that the uncertainties associated with a representative person, such as his habits, biological parameters, should not be taken into account.		X		Additional information on consideration of uncertainties is given in paras 9.20 to 9.22. A reference to these paragraphs was included in 7.25.
301	7.27	Reports of the results of the source monitoring and environmental monitoring programmes should be produced at periodic intervals, at least once per year, by the responsible party to monitor the evolution of radiological conditions and, in situations when remediation was justified and implemented, to verify the effectiveness of the of remedial actions.	Please clarify what are periodic intervals for this case.	X			

302	8.	The radiation monitoring system is designed to provide information that flows regularly, and occurs automatically, for the benefit of the competent authorities and other concerned parties, which allows expanded coverage of radiation monitoring emanating from the affected lands in the long term. In order to assess the conditions of radiation exposure and study the extent of development in The effectiveness of prevention strategies, provided that they are supervised by the competent authorities that bear the responsibility. These records are of particular importance in defining and identifying groups exposed to potential risks, in conjunction with health monitoring. For such a system to work permanently, this requires a professional maintenance system and continuous training on it. Using competent training programs by national and local authorities.	From a practical point of view, the performance of this practice requires the availability of powerful radiation monitoring system; It performs measurements of ambient dose rates, and radionuclide concentrations in materials food and in the environment, careful examination of radioactive contamination of individuals; And also measuring pollution in the rest of the human body.			X	Section 8 is intended to describe aspects of the implementation of a monitoring programme which are applicable to all types of exposure situations. The proposed new text has details that are applicable only for emergency situations. The use of on-line and fixed location equipment for monitoring is included in 8.27 and Table 4. On-line networks are covered in 5.22 and 6.5. The recommendations for maintenance and training are addressed elsewhere in section 8 (8.21, 8.26, and 8.34).
303	8.1	A monitoring programme should be designed using a systematic approach. The characteristics of the exposure situation (planned, emergency ~~existing~~ or ~~emergency~~ existing), …	Please use the same order all over the text.	X			

304	p.52/ (Table 2)	o The following is suggested. In the table 2, the column of dose assessment is added.	o Based on DPP DS505 section 3, the relationship between monitoring and modelling is one of areas to be undated in the revision of RS-G-1.8. o Table 1 in the RS-G-1.8 has a dose assessment column. o In my opinion, it should be helpful to understand the relationship between monitoring and dose assessment modeling by adding a column of dose assessment in the table.			X	The safety guides GSG 9 and GSG 10, published after RS-G-1.8, address dose assessment. As these documents complement DS505, we consider that a detailed description of dose assessment in this safety guide is not required. Moreover, we consider that including a dose assessment column in Table 2 will not add value, as the table is intended to summarize the types of monitoring recommended for different exposure situations, and a dose assessment is recommended for all types of exposure situations, as appropriate.

305	Table 2	Notified or registered practices/sources	Clarification. Notified practices/sources should be added in this table.		X		Notified practices were included together with exempted and excluded practices/sources instead of registered practices/sources as the requirements for monitoring for notified practices are consistent with the requirements for monitoring for exempted and excluded practices/sources.
306	Table 2	Individual monitoring for members of the public	Clarification.	X			
307	Table 2		Delete the text on exempted, registered and multiple sources as not relevant			X	The explanation provided from para 5.2 to para 5.5 is included to be useful for a broader audience of users of the document.
308	Para 8.3		It is proposed to indicate in the listing "c" what is meant by the term "release rate".	X			The following was included: "Radionuclide activities being released per unit of time."
309	Fig. 1		The figure does not take into account the paths of transfer of radionuclides from soil to water, wind carryover of contaminated soil, as well as soil ingestion (for example for children).	X			This figure will be redrawn, a new figure is being prepared and it will be included before the next step.

310	8.5	The scale and extent of monitoring programmes should take into account the information from safety assessments (for planned exposure situations) and also from the radiological hazard assessment (for emergency exposure situations) which can assist in defining the areas of the environment potentially impacted, the radionuclides involved, and the dose to the representative person in each area.	Clarification.	X			
311	8.7/ Second line	"…radiation or the release of ~~radionuclides~~ radioactive material arising from a facility or activity."	Mostly the term "radioactive material" is used.	X			
312	8.9	Additional supporting information that should be considered in the design of a source monitoring programme includes information on the chemical form (i.e. which can affect the migration of radionuclides), temperature and flow rates of the release, as well as meteorological and hydrological data and information on the ~~receiving~~ environment.	Clarification.	X			
313	8.14	Individual monitoring for members of the public may be appropriate in certain emergency exposure situations (see paras 6.22~~–6.27~~6.26).	Please check reference to para.	X			
314	8.14	The 1st sentence suggest that individual monitoring could only be set up in Emergency exposure situation, but it could also make sense in ExES…	In the case of an accidental release or a malicious act, it could be imagine that the health follow up would continue during the existing phase, even after the end of the emergency phase.	X			A sentence was added to reflect that in certain existing exposure situations individual monitoring may be needed.

315	8.14	It should be added that "monitoring program have to be adapted to the situation, in particular to the size of the population to control"	A graded approach may have to be decided for the screening of the whole population of the territory and complemented by additional measurements for the most exposed / sensitive people	X			
316	8.15	Baseline monitoring data and data from control measurements, as appropriate, should be collected over a period as deemed necessary by the regulatory body or other relevant authority to enable the understanding of spatial and temporal trends (e.g. over *at least two years*).	Why two years, do we have any requirements/references about this? Please clarify.			X	It is only a recommendation, typical for environmental studies, based in the need to consider natural variability of environmental conditions impacting in the activity concentrations to be measured (e.g, dry year versus rainy year).
317	8.16	For planned exposure situations (and existing exposure situations), the hydrological characteristics of the aquatic environment and the meteorological characteristics of the atmosphere into which radionuclides are expected to be released should be monitored in the pre-operational stage (or during characterization studies) and periodically verified in the operational stage and while the exposure situation remains. For emergency exposure situations, where possible, studies performed in the operational stage should be used to identify the general characteristics of the environment that might affect accidental releases and which should be considered in the monitoring programme.	Suggest putting 'and existing exposure situations' in brackets so as to clarify that the monitoring for existing situations is during the characterisation studies, not in the pre-operational stage. Not all emergencies are preceded by an 'operational stage'	X			

318	8.18 line 5/6	Land and water use, such as local practices of agriculture, and aquaculture should be considered ~~as well as agricultural practices~~.	Repetition ("local practices of agriculture" and "agricultural practices").	X			
319	Para 8.18	Environmental monitoring programmes should take account of the distribution and habits of the population in the vicinity of the site or area, and other factors that may be relevant to estimate doses, such as age ~~distribution,~~ food consumption rates and the fractions locally obtained, location of drinking water sources, and human activities.	It is proposed to exclude the age **distribution** of the population as an insignificant factor for the environmental monitoring program.	X			

320	Para 8.20	The specific content for Source Monitoring Program, Enviornmental Monitoring Program and Individual Monitoring Program may be included in the safety guide.	The generic contents of monitoring program are given. The specific contents for Source Monitoring Program, Environmental Monitoring Program and Individual Monitoring Program may be included in the safety guide.			X	The specific content for a monitoring programme will depend on the exposure situation, specific characteristics of the area, facility or activity and objectives of the monitoring programme, as well as on other programme specific factors. Therefore, it is not appropriate to include this level of detail in a general safety guide. Annex 1 gives some examples of specific parameters for a planned exposure situation, and additional information can be found in the SRS 64 [Ref 43].
321	8.21	"The monitoring programme should also provide information on procedures for managing and interpreting the data, assessing data quality, and reporting the results, including uncertainties."	Recognise the need for understanding the uncertainty associated with the results.	X			
322	8.24 Table 3	Sampling Approach Description Comment	Repetition of the tables' header row on the second page is missing which leads to inconsistency with the other tables in the document. Please add.	X			

323	Para 8.29	If monitoring data are used to verify compliance with a dose limit or a dose constraint, or compared to an operational limit or reference level, the ~~minimum detectable activity~~ **detection limit** of the analytical procedure and equipment should be selected so as to enable measurements to be made at levels that are substantially lower than the limits or levels against which the results are to be compared. This could, for example, involve **use of more sensitive equipment,** collecting a statistically significant number of samples, improving measurement statistics and/or increasing counting times. The contribution of multiple radionuclides to the total dose to the public should also be considered in the determination of a fit-for-purpose detection limit.	Clarification of the term. It is proposed to supplement the paragraph with an example of the use of more sensitive equipment.	X			
324	8.30	The equipment to be used for measurements should be selected taking into account the purpose for which it is to be used. In particular, it should take into account the specific radionuclides that may be present ~~that might be released from a facility~~, both in normal operation and in accident conditions. For example, nuclear power plants may discharge a large number of radionuclides with half-lives ranging from seconds to thousands of years, whereas fuel fabrication facilities discharge a much narrower range of radionuclides with no short lived radionuclides.	This paragraph is very specific to facilities. The suggested edit widens the application.	X			

325	8.33	An adequate quality assurance programme should be designed to satisfy as a minimum the general requirements established by the regulatory body or other authority for quality assurance in the field of radiation protection.	Consistency with GSR Part 7. Not all monitoring programs, particularly for off-site response in an emergency, will be under the authority of the nuclear regulatory body.	X			
326	Para 8.34	c) The uncertainty analysis; (d) The requirements for record keeping; (e) The qualification and training of personnel, including the necessary theoretical knowledge, the relevant legislation and regulations, and the appropriate technological tools to perfom tasks related to the monitoring programme.	Incorrect alphabetical ordering	X			
327	8.34	Suggested addition for the quality assurance programme: - Robust chain of custody, information management system	Omission.		X The text was included as follows: - Robust chain of custody - Description of the information management system		

328	Page no 62 , Para 8.34 (g)	The qualification and training of personnel, including the necessary theoretical knowledge, the relevant legislation and regulations, and the appropriate technological tools to **perform** tasks related to the monitoring programme.	Editorial The word "perfom" may be corrected to **"perform"**	X			
329	8.37	Monitoring programmes should be *evaluated and reviewed regularly* to ensure that they are producing data that are sufficient to meet the objectives of the programme and that no significant routes of discharge or environmental transfer or no significant exposure pathways have been overlooked.	How regularly? Do we have any requirement about this? Please specify.	X			Text was modified as follows: Monitoring programmes should be evaluated and reviewed regularly, **with the frequency established by the regulatory body or, in the case of planned exposure situations, when changes are anticipated in operations of the facility or activity, which affect the radionuclides composition or magnitude of the discharges,** to ensure that they are producing data that are sufficient to meet the objectives of the programme and that no significant routes of discharge or environmental transfer or no significant exposure pathways have been overlooked. If this is the case, causes should be identified, and changes in the monitoring programme should be implemented.

330	8.37	8.37. Monitoring programmes should be evaluated ~~and reviewed regularly~~ to ensure that they are producing data that are sufficient to meet the objectives of the programme and that no significant routes of discharge or environmental transfer or no significant exposure pathways have been overlooked	A review is necessary only if significant changes occur. This is addressed in 8.38 and 8.39.		X The text was modified as follows: "Text was modified as follows: Monitoring programmes should be evaluated and reviewed regularly, **with the frequency established by the regulatory body or, in the case of planned exposure situations, when changes are anticipated in operations of the facility or activity, which affect the radionuclides composition or magnitude of the discharges,** to ensure that they are producing data that are sufficient to meet the objectives of the programme and that no significant routes of discharge or environmental transfer or no significant exposure pathways have been overlooked. If this is the case, causes should be identified, and changes in the monitoring programme should be implemented."		

331	8.X and 9.X	For several alineas some precisions should be indicated when applicable more to one situation than another. Feeling that, especially in §9, balance is towards Planned or Existing situations.	8.X and 9.X	X			A number of amendments were included in Sections 8 and 9 to make the recommendations more general or to indicate for which situation the recommendation applies. This will also be revaluated in further steps (after receiving Member States comments).

332	Section 9	Uncertainties in monitoring data and major sources of uncertainties in dosimetric models should be taken into account in determining the uncertainties in dose assessments made on the basis of monitoring results.	Uncertainties in monitoring data determining the uncertainties in dose assessments made on the basis of monitoring results as presented in Table 7 of RS-G-1.8 may kindly be included.		X Uncertainties are covered in paragraphs 9.20 to 9.22 at the general level. Reference to SSR 64 in where more information can be obtained, was included. Also, the inclusion of model uncertainties if used in dose assessment was made in the following amended text: "When interpretating monitoring data, particularly when estimating public doses that are used in the decision making process to protect the public and/or the environment (e.g. decisions about implementation of protective actions or remedial actions), uncertainties in the monitoring data alongside those in any environmenta and dosimetric models being used, should be considered."		

333	9		Please consider that Chapter 9 needs to be appropriate for all exposure situations and that each of the Chapters 5-7 has a section on Interpretation, reporting etc. Careful consideration is needed to avoid overlaps between Chapter 9 and the sections mentioned above. Careful consideration is also needed to avoid recommending unjustified measures. What is appropriate may differ significantly in different circumstances (e.g. urgent phase of an emergency vs. a planned exposure situation). For example, c.f. comment on 9.18.	X			A number of amendments were included in Section 9 to make the recommendations more general or to indicate for which situation the recommendation applies. This will also be reevaluated in further steps (after receiving Member States comments).
334	9.11	Information from monitoring programmes should be used to assess radiation doses to members of the public for comparison with criteria established by the regulatory body or other authority.	Consistency with GSR Part 7. Dose criteria for off-site public doses in an emergency may not necessarily be under the authority of the nuclear regulatory body. For example, this could be the responsibility of a health ministry or other response authority.	X			
335	Page no 67 ,Para 9.14, line no 7	For indirect measurements, dose coefficients that relate the measured or estimated **activity** concentration to a dose rate should be used.	Editorial The word "activitity" may be corrected to "**activity"**	X			
336	9.16 Line 3	… When only source monitoring results are available or when environmental monitoring does not provide sufficient data on radiation levels and activity concentrations in air, water and food~~;~~, models for transfer of radionuclides through the environment and the food chains could be used	Please use comma, otherwise meaning of the statement is not clear.	X			

337	9.16 line 5	"food, models for"	Spelling	X			
338	9.16	~~When environmental monitoring provides results on the radiation levels and activity concentrations of radionuclides in air, water and food, dose coefficients should be used for the purposes of dose assessment, in conjunction with habit data. When only source monitoring results are available or when environmental monitoring does not provide sufficient data on radiation levels and activity concentrations in air, water and food; models for transfer of radionuclides through the environment and the food chains could be used.~~ Please replace the text above with the one below: The use of models for transfer of radionuclides through the environment and the food chains should be used for the purposes of dose assessment, when possible, complemented as appropriate and as necessary by results provided by environmental monitoring. Please implement the same modification, as appropriate, in other relevant parts of the draft.	In various parts of the draft it is mentioned that the data provided through monitoring should be used for the evaluation of doses. As already mentioned during the TM and other occasions, annual doses are rarely estimated on the basis of environmental monitoring results and should not be estimated/calculated only in this way. In fact, there are several results < LoD (decision threshold) in routine monitoring that do not allow dose calculation without being too much conservative. The representativeness criterion of the calculated dose is not met, because too far from reality. Therefore, the annual effective dose to the representative person should not be estimated based on environmental monitoring. It could be done using models and the total amount of radioactivity discharged during a year, radionuclide by radionuclide. However, the results provided by the environmental monitoring could be compared to the results of models.			X	Activity concentrations in the environment and external dose rates can be used with habit data and dose coefficients to estimate doses. Doses can also be calculated using source monitoring/discharges and environmental models, habit data and dose coefficients. Therefore, both source and environmental monitoring data can be used for dose assessment, which is expressed in para 9.16. This is also consistent with para 5.3, of GSG 10.

339	9.18	The calculation of doses from the results of environmental monitoring in case of planned exposure situations requires appropriate processing of the monitoring results. The background radiation, whether natural background radiation or that due to fallout from nuclear weapon tests, should be identified, generally by means of comparison with results from monitoring in an area that has not been contaminated, and should be subtracted from the results.	Please underline, that subtraction of the background radiation from the results is meant for calculation of dosed in planned exposure situations.		X The text was modified as follows (sentence included after the end of the paragraph): "In emergency exposure situations and in some existing exposure situations, the background radiation may in some cases be negligible compared to the projected doses and may then be ignored in the calculations."		A sentence was added to reflect that the background radiation subtraction can be neglected in some existing and emergency exposure situations.
340	9.18	Add sentence: In emergency exposure situations, the background radiation may in some cases be negligible compared to the projected doses and may then be ignored in the assessment.	The paragraph needs to be appropriate for all exposure situations. For example, in the early phase of an emergency exposure situations, where the dose assessment from monitoring primarily aims at identifying groups which may receive projected doses corresponding to the criteria for relocation etc., the background levels can be ignored.		X The text was modified as follows (sentence included after the end of the paragraph): "In emergency exposure situations and in some existing exposure situations, the background radiation may in some cases be negligible compared to the projected doses and may then be ignored in the calculations."		

341	Para No. 9.21	The maximum value of allowed uncertainty may be provided in the safety guide.	It is stated that uncertainties cannot be eliminated but they can be reduced and controlled by use of appropriate standard procedures in the field and in the laboratory. The quantitative value for the the maximum allowed uncertainty is not given in the safety guide which may be included.		X Paragraph 9.21 was modified as follows: "<u>The acceptable level of uncertainty should be commensurate with the magnitude of the quantity being measured and the relevant criteria for making decisions.</u> Uncertainties cannot be eliminated but they ~~can~~ should be reduced and controlled by use of appropriate standard procedures in the field and in the laboratory, and by use of a quality assurance programme to verify that these procedures are followed."		It is not possible to establish a generic quantitative value for the maximum allowed uncertainty that applies to all situations, as uncertainties, especially those involving the measurement of radionuclide concentrations, depend on many parameters specific to the situation, for instance, the techniques being used for measurement. A sentence was included in paragraph 9.22 to qualitatively inform on the appropriate magnitude of uncertainties.
342	9.22 line 2	… at a frequency required by the regulatory body or other <u>competent</u> authority,	Specification	X			
343	Para 9.27	The regulatory body is required to publish or make available on request, **as appropriate,** results from monitoring programmes and related dose assessment to the public (see para. 3.136 of GSR Part 3 [1]).	It is proposed to bring the paragraph into compliance with the provisions of paragraph 3.13 of GSR Part 3.	X			

344	Reference [9]	INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Power Plants: Design, IAEA Safety Standards Series No. SSR-2/1 (Rev. 1), IAEA, Vienna (~~2012~~2016).	Clarification. Rev. 1 of SSR-2/1 was published in 2016.	X			
345	All (references)	Check consistency in terms of the references.	Some examples: • Footnote 25: Which states that "content and format of reports of measurement results" are included in IAEA Glossary • The Annex reference refers to SSG-32 which does not include the data in the Annex. • Reference 40 is not mentioned in the body of the document.	X			Reference to footnote 25 (32) was reference 45, this was corrected. Some references were included, and the lists of references were amended and checked according. The previous ref 40, is mentioned in para 6.11 (a).
346	New Section	Education and Training	The GSR part 3 clearly mentioned the requirements of education, training and competence. Furthermore RS-G-1.8 was also containing a separate Section 11 on education and training. Please include.			X	The section on education and training in RS-G-1.8 provides only general guidance in 4 paragraphs. Education and training are covered in DS-505 in relation to the quality assurance programme as part of the management system
347	Para A-2		It is proposed to clarify what is meant by "on-line measurements". Other industries also use the terms "inline measurements", "atline measurements" and "offline measurements". Perhaps the term "real time measurements" was meant.	X			

348	A-6 and New A-7	A–6. As generally the concentrations of radionuclides are measured in the discharged effluents, an accurate measurement of the volume of discharged effluent is needed to derive the radionuclide quantities discharged into the environment. A-7. The diffuse discharges might be assessed from various parameter measurements, including parameters of the industrial processes, or from environmental measurements in the vicinity of the facility. The procedure to estimate diffuse discharges will normally be specified or approved by the regulatory body.	Since para. A-6 states two topics, para. A-6 should be divided into two paragraphs.	X			

349	A-8	Sampling locations are therefore selected close to points where the maximum exposure or deposition is expected for airborne discharges, or downstream from the release point for aquatic discharges, where the representative person lives or gets food. ~~where sensitive biota or species at risk endangered species have been identified~~. to be replaced by : In special cases when a specific monitoring of endangered species or in protected areas is required, samples should also been taken in or close to this protected area or where the endangered species have been identified.	According to 1.19. […] The monitoring programmes for members of the public would be sufficient to validate the generic assessment for flora and fauna. **For very specific cases, for example when dealing with endangered species or in protected areas, the government or the regulatory body could decide whether specific monitoring for a particular flora or fauna would be necessary. […]** Paragraph A-8 should therefore be consistent with 1.19 and samples should be collected near endangered species are living or protected area only in case a specific monitoring of that area are required, but not generally. Moreover sensitive biota is not defined in the safety guide itself. Please use the same terminology as in the main text of the Safety Guide.		X Text was modified as follows: "Sampling locations are therefore selected close to points where the maximum exposure or deposition is expected for airborne discharges, or downstream from the release point for aquatic discharges, where the representative person lives or gets food~~,~~ ~~where sensitive biota or species at risk have been identified,~~ or (for direct radiation from the source) at the site boundary. In special cases when a specific monitoring of endangered species or in protected areas is required, samples can also be taken in or close to this protected area or where the endangered species have been identified. Since atmospheric dispersion and water dispersion might vary significantly from year to year, a part of the monitoring measurements needs to be performed at the same location for the year by year comparison of the results."		

350	Annex A-8	The main objectives of environmental monitoring during normal operation are the verification of compliance of measured values with environmental limits, or the comparison of measured values with predicted values of dose rates or radionuclide concentrations in environmental samples. Sampling locations are therefore selected close to points where the maximum exposure or deposition is expected for airborne discharges, or downstream from the release point for aquatic discharges, where the representative person lives or gets food~~, where sensitive biota or species at risk have been identified, or (for direct radiation from the source) at the site boundary~~. Since atmospheric dispersion and water dispersion might vary significantly from year to year, a part of the monitoring measurements need to be performed at the same location for the year by year comparison of the results.	The notion of « sensitive biota » should be precised. Does the term correspond to the notion of endangered species as mentioned in para. 1.19 ? If yes, this seems problematic with regard to 2 aspects: ○ This is not consistent with the European ERICA approach, based on organisms that are representative of the ecosystems in which they are living (and which therefore covers all specific species); ○ This creates an additional pressure/constraint on species that are already threatened, and this could ultimately be detrimental to the balance of the ecosystem and biodiversity.		X The text was modified as follows: "Sampling locations are therefore selected close to points where the maximum exposure or deposition is expected for airborne discharges, or downstream from the release point for aquatic discharges, where the representative person lives or gets food~~, where sensitive biota or species at risk have been identified,~~ or (for direct radiation from the source) at the site boundary. <u>In special cases when a specific monitoring of endangered species or in protected areas is required, samples can also be taken in or close to this protected area or where the endangered species have been identified. S</u>ince atmospheric dispersion and water dispersion might vary significantly from year to year, a part of the monitoring measurements needs to be performed at the same location for the year by year comparison of the results."		

351	Para A-13		It is proposed to supplement the recommendations on the physical separation of not only equipment, but also laboratories involved in low-background measurements. Also considered advisable to introduce a recommendation for the location of low-background laboratories outside nuclear facilities sites.	X			The following was included: "It is advisable to have separate laboratories for performing low-level measurements and effluent analyses. When possible, it is advisable to allocate the laboratory for low-level measurements outside of the facility."
352	Title before A-2 and A-8	SOURCE MONITORING DURING ~~NORMAL OPERATION~~ operational states OF FACILITIES ENVIRONMENTAL MONITORING IN ~~NORMAL OPERATION~~ operational states OF FACILITIES	What about anticipated operational occurrence? Annex is about planned exposure conditions. We would like to suggest "operational states" here.	X			
353	TABLE A–1 Air / Monitoring Location	-Near areas with *sensitive biota* Note X: only applicable if a specific monitoring of endangered species or of a protected area is required	A footnote should be added to mention that this sampling location only applies if specific monitoring of endangered species or a protected area is required (consistency with 1.17, 1.19 and A-8). Moreover "sensitive biota" has not been defined previously and should be replaced by " endangered species or protected area"	X			

354	TABLE A–1 Deposition/ Monitoring Location	-Near areas with *sensitive biota* Note X: only applicable if a specific monitoring of endangered species or of a protected area is required	A footnote should be added to mention that this sampling location only applies if specific monitoring of endangered species or a protected area is required (consistency with 1.17, 1.19 and A-8). Moreover "sensitive biota" has not been defined previously and should be replaced by " endangered species or protected area"	X			
355	TABLE A–1 Deposition/ Monitoring Location	-Near areas with *sensitive biota* Note X: only applicable if a specific monitoring of endangered species or of a protected area is required	A footnote should be added to mention that this sampling location only applies if specific monitoring of endangered species or a protected area is required (consistency with 1.17, 1.19 and A-8). Moreover "sensitive biota" has not been defined previously and should be replaced by " endangered species or protected area"	X			

356	TABLE A–1.	In the column "Monitoring location", please delete all the mentions "-Near areas with sensitive biota"	The notion of « sensitive biota » should be precised. Does the term correspond to the notion of endangered species as mentioned in para. 1.19 ? If yes, this seems problematic with regard to 2 aspects: o This is not consistent with the European ERICA approach, based on organisms that are representative of the ecosystems in which they are living (and which therefore covers all specific species); o This creates an additional pressure/constraint on species that are already threatened, and this could ultimately be detrimental to the balance of the ecosystem and biodiversity.		X The text was modified as follows: "Near areas with ~~sensitive biota~~ endangered species or protected areas".		
357	Table A-2, Aquatic environment - surface water	The option of doing grab sampling (e.g., weekly) should be added	Continuous sampling is not possible in all weather conditions from rivers. Therefore, the option of doing regular grab sampling should be allowed to fulfill this requirement.	X			Spot sampling was added.
358	Table A-3, Aquatic environment - surface water	The option of doing grab sampling (e.g., monthly) should be added	Continuous sampling is not possible in all weather conditions from sea water. With batch type releases and no other release routes, the continuous surveillance is not always necessary. Therefore, the option of doing regular grab sampling should be allowed to fulfill this requirement.	X			Spot sampling was added.

359	Table A-3		Footnote “a” is proposed to be supplemented with a clarification that control is provided for significant quantities of tritium, carbon, strontium and alpha-emitting radionuclides.			X	The column heading indicates that nuclides should only be measured as appropriate to the source. The note was trying to emphasize that these nuclides are expensive and resource intensive and therefore only analysed if present in the discharge.
360	Table A-3, Note 2	Potassium can be ~~is~~ measured in order to derive the Potassium-40 content. Alternatively, K-40 can be measured directly by gamma spectrometry to be subtracted from gross beta measurements.	Clarification. Either “can be” or “is” must be deleted. By deletion of “is” consistency with note 2 of table A-2 and note 3 of table A-1 is achieved.	X			
361	Page no 81	The title “ANNEX REFERENCE” can be changed to “REFERENCE TO THE ANNEX”	Editorial and in line with other published IAEA General Safety Guides.	X			
362	Page no 81 , ANNEX REFERENCE	“ANNEX REFERENCE” given in the document contain only one reference and the content given in the annex is not found in the given annex reference.	The Annex Reference is mentioned as SSG-32 which deals with the protection of the public against exposure indoors due to radon and other natural sources of radiation. Additional references covering sampling and measurement for routine discharges in planned exposure situation may be added in the annex reference.	X			