

**DS524 - DPP SG Radiation Protection Aspects of Design for NPPs
Resolution of Comments**

COMMENTS BY REVIEWER				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
UK 1	General	General Comment no proposed text change, but recognition that ONR welcomes and is supportive of this proposed revision and its timing due to the nuclear new build programme being undertaken in the UK at this time.		X			
Canada 1	overall	This DPP does not address ALARA, and in particular optimization of chemistry and materials to reduce radiation field build-up and to reduce generation of radioactive waste	For considerations	X	The topics are already included in the existing NS-G-1.13 and will be revised and included as well.		
Canada 2	overall	A clearer distinction between RP aspects of design and programmatic aspects for RP is needed.	For considerations	X	It will be considered.		
Canada 3	overall	At first glance and given the following statement taken verbatim from this DPP <i>“this Safety Guide is relevant to design issues associated with modifications to existing plants and their decommissioning”</i> we suggest adding a sub-section under chapter 3 to address design consideration for ageing	For considerations	X	It will be a subsection not indicated in DPP. SSG-48 is included in the List of References.		

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		<p>management and long-term operation.</p> <p>This is of crucial interest for member states with mature and long-standing nuclear programs. The recently published SSG-48 (November 2018) on “<i>Ageing Management and Development of a Programme for Long-Term Operation of Nuclear Power Plants</i>” is offering basic guidance on this matter. The IAEA should consider expanding on this baseline info through the revision of this safety standard (NS-G-1.13).</p>					
USA 3	Generic	<p>The document would benefit by listing some key measures to be discussed/described in the guidance when developed.</p> <p>The document also references 20+ documents. These documents should be included in the reference section of the DS (provided that they are discussed in the document). The US believes that there are 3 documents of particular importance that should be referenced and considered during the development of the DS:</p> <p>These guides, which were issued</p>	Clarity of Scope	X	The proposed Safety Guides (GSG-8, GSG-9, GSG-10 are included in the DPP.		

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		recently, are: GSG-8 (Radiation Protection of the Public and the Environment); GSG-9 (Regulatory Control of Radioactive Discharges to the Environment); and GSG-10 (Prospective Radiological Environmental Impact Assessment for Facilities and Activities).					
UK 2	Section 3 Para 4	Since the publication of NS-G-1.13, experience has been gained from design assessment activities and improvements have been introduced to plant designs for new NPPs and modifications to existing NPPs in different areas that affect radiation protection of workers and members of public such as outages, maintenance, communication technologies, automation and management of plant operations.	Recognition of the significant design assessment activities carried out since the last revision and the subsequent influence on design improvements following assessments enhancing radiological protection of these facilities.	X			
UK 3	Section 5, Para 1	for all operational states, including commissioning and accident conditions, including for the decommissioning stage	Having reviewed the related Safety Requirements and considered experience and learning from recent assessments I consider it necessary to make an explicit statement with regard to “Commissioning”. Experience suggests designers, constructors and operators are not consistently considering commissioning chemistry and specifically with respect to	X			

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			Radiological Protection at this point. Lack of appropriate consideration at the design stage may also lead to greater RP hazards during plant operations.				
UK 4	Table of Contents, 3	3. GENERAL ASPECTS OF RADIATION PROTECTION IN DESIGN 3.1. Description of Sources of Radiation 3.2. Use of Operating Experience 3.3. Design Considerations for Commissioning 3.4. Design considerations for operation and accident conditions 3.5. Design considerations for decommissioning	Inclusion of specific chapter section on Design Consideration for Commissioning, required to explicitly communicate guidance on the importance of aspects of correct materials selection in relation to operational requirements and safety functional requirements of the plant design to ensure Radiological Protection is controlled.	X	Design considerations for operation and <u>commissioning</u>		
SA 1	Section 6	In light of requirement 5 of SSR-2/1, and for the reason of assisting in making decisions early in the design processes which influence radiation protection measure, it would have been reasonable to make some reference to GS-G-2.1 'Arrangements for Preparedness for a Nuclear or Radiological Emergency' (and GSG-2).	Scope: DS524 is covers design considerations for accident conditions	X	GSG-2 and GS-G-2.1 are included into the List of References. GSR part 3 and 7 were already included earlier.		

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		Unless it is regarded as good enough to just make reference to GSR part 3 and 7, without specifically invoking these two guides.					
SA 2	Section 3	A summary of new requirements that were not addressed in NS-G-1.13 on the DPP would have been helpful	For completeness of information, to guide the reviewer	X	New requirements were added in the List of references and the Section 3.		
Ukraine 1	2/15	It is proposed to replace the title “2 SAFETY OBJECTIVES, DOSE LIMITATION AND OPTIMIZATION OF PROTECTION AND SAFETY” with “2 SAFETY OBJECTIVES, DOSE LIMITATION AND OPTIMIZATION OF PROTECTION AND SAFETY DURING OPERATION AND DECOMMISSIONING” and add new items, in particular: 2.1 Design targets for operational states 2.2 Authorized personnel dose limits and dose constraints for operational states and decommissioning 2.3 Authorized public dose limits and dose constraints for operational states and	The objective of the proposed changes is to guarantee radiation safety for personnel and public by adopting design solutions proceeding from restrictions of public and personnel exposure during normal operating conditions as well as under accidents. For example, limitation of public exposure during normal operation immediately leads to requirements to reduce releases and discharges, and limitation of personnel exposure requires specific design solutions on the entire NPP environment (circuit activity, bioshielding etc.). The same is with limitation of personnel and public exposure during accidents, what requires	X	These recommended Titles will be included as subtitels.		

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		<p>decommissioning</p> <p>2.4 Application of the personnel optimization principle for operational states and decommissioning</p> <p>2.5 Application of the public optimization principle for operational states and decommissioning</p> <p>Add Para “3 SAFETY OBJECTIVES, DOSE LIMITATION AND OPTIMIZATION OF PROTECTION AND SAFETY FOR ACCIDENT” with new items:</p> <p>3.1 Design targets for accident states</p> <p>3.2 Authorized personnel dose limits and dose constraints for accident</p> <p>3.3 Authorized public accident dose limits and dose constraints</p> <p>3.4 Application of the personnel optimization principle for accident states</p> <p>3.5 Application of the public optimization principle for accident states</p>	adequate design solutions for radioactive release confinement as well as for accident management possibility with involvement of emergency personnel.				
Sweden			Requirement 81 and 82 in SSR-				

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1		: In particular it will provide recommendations on meeting Requirement 5, 81 and 82 of SSR-2/1 (Rev. 1).	2/1 is about for Radiation Protection and should be mentioned here.				
Iran 1	Clause 5 (Scope)/ First paragraph Table of /contents/ Bullet 2	<p>“Table of contents 2. SAFETY OBJECTIVES, DOSE LIMITATION, ACCEPTABLE LIMITS, AUTHORIZED LIMITS AND OPTIMIZATION OF PROTECTION AND SAFETY 2.3 Application of acceptable limits and authorized limits into design.”</p>	<p>According to the scope: “This safety guide will describe the measures to be taken in design of nuclear power plants for the radiation protection of workers and the public, and for protection of the environment, for all operational states and accident conditions, including for the decommissioned stage.” But according to the bullet 2 of the table of contents, in this guide, only dose limitation has been considered.. The definition of “dose limit” according to the IAEA Safety glossary is: “The value of the effective dose or the equivalent dose to individuals in planned exposure situations that is not to be exceeded.”</p> <p>So according to this dpp, the protection of the environment and the accident conditions have not been included in this guide.</p>	X	Acceptable limit and authorized limit will be considered in this guide.		

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			<p>Requirement 5 of SSR2/1 is as follows: “Raditaion protection in design The design of a nuclear power plant shall be such as to ensure that radiation doses to workers at the plant and to members of the public do not exceed the dose limits, that they are kept as low as reasonably achievable in operational states for the entire lifetime of the plant, and that they remain below acceptable limits and as low as reasonably achievable in, and following, accident conditions.” The definition of “acceptable limit” according to IAEA Safety Glossary is: “a limit acceptable to the regulatory body · The term acceptable limit is usually used to refer to a limit on the predicted radiological consequences of an accident (or on potential exposures if they occur) that is acceptable to the relevant regulatory body when the probability of occurrence of the accident or potential exposures has been taken into account (i.e. on the basis that it is unlikely to occur). · The term</p>				

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			<p>authorized limit should be used to refer to limits on doses or risks, or on releases of radionuclides, which are acceptable to the regulatory body on the assumption that they are likely to occur.”</p> <p>According to the above mentioned paragraphs, acceptable limit and authorized limit should be considered in this guide too.</p>				
Japan 1	The first sentence of 2nd bullet of "5.Scope"	Although the majority of the new design for nuclear power plants are for water cooled reactors, <u>the scope of</u> this Safety Guide may will also be relevant to cover other types of commercial reactors;	Clarification.	X			
Japan 2	Line 4 of the first paragraph of 7. OVERVIEW	(as stated in GSG-7 and by taking into account the itinerant workers)	<p>Delete the word “the itinerant workers.”</p> <p>Design to reduce radiation exposure is a common issue for radiation workers, not just for the itinerant workers. Therefore, the wording of "the itinerant workers" is not appropriate and should be deleted.</p>	X			

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Japan EPreSC, RASSC	5. SCOPE	Comment	As a brief overview, the draft DPP should highlight some examples of measures to be taken in the design of nuclear power plants such as release reduction systems for accident conditions (e.g. Filtered Containment Venting System). For operational stages, it could include control of sources radiation, system design, component design, remote techniques, decontamination, shielding, ventilation, waste treatment systems, storage of radioactive waste at the plant, discharge criteria, source reduction, and effluent treatment systems as given in NS-G-1.13, but this revision should also take into account the improvements in the latest design.	X	Recommended topics will be included in the DS524 as given in NS-G-1.13 but this revision will also take into account the improvements in the latest design Relevant references were added: IAEA SGs NS-G-1.9 (DS481) and DS 440.		
USA 1	Section 4. Objective Paragraph 2	could be further enhanced by means of reasonably practicable safety improvements” <u>consistent with the member state’s regulations:</u>	Please add the underlined text to allow flexibility for individual member states to address incompatibilities between legacy and updated standards.	X			
USA 2	Sections 3 and Section #4	DS524 is intended to be a revision of NS-G-1.13 on “Radiation Protection Aspects of Design for	Clarity of Justification and Objective.	X			

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		NPPS (issued in 2005). The main justification and objective for this revision is to address new safety requirement under SSR-2/1 (Rev. 1, 2016), particularly Requirement #5; and requirements under GSR Part 4 Rev. 1, 2016). In this context, we recommend the “Justification,” and the “Objective” Sections be expanded to summarize new requirements that were not addressed in NS-G-1.13.					
Germany WASSC 1	Section 6	Please add SSG-47 “Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities” to the list.	Section 7.5 to 7.9 of the SSG are also relevant and interferes with the scope of the DPP. E.g. “7.6. Relevant features and aspects that should be considered during the design stage of a facility to facilitate decommissioning, and which should not reduce but might enhance the safe operation and maintenance of the facility, include the following: (a) Minimization of the number and size of contaminated areas to facilitate decontamination during decommissioning; (b) Facilitation of access to SSCs, including compartmentalization of processes (e.g. through incorporation of hatches and large	X			

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			doors); (c) Minimization of underground piping and of embedded pipes in the building structures (e.g. through the use of pipe trenches and pipe sleeves); (d) ...”				
Germany WASSC 2	Section 6	Please add GSR Part 6 “Decommissioning of Facilities” to the list.	GSR Part 6, especially Requirement 10 and the following paragraphs (e.g. “7.3. For a new facility, planning for decommissioning shall begin early in the design stage and shall continue through to termination of the authorization for decommissioning.”) are also be applicable in the new Guide.	X			
PAK 1 WASSC	Section 6	IAEA GSR Part 5: Predisposal Management of Radioactive Waste IAEA GSR Part 6: Decommissioning of Facilities	May be included in reference documents list. <ul style="list-style-type: none"> ▪ GSR part 5 is applicable for waste management generated from various facilities including NPPs. As the IAEA SSG -40 is mentioned in the References. ▪ In the scope it is mentioned that subject RG is also applicable to Decommissioning however, reference documents is not included in the list. 	X			

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PAK 2 WASSC	Section 2, Table of Contents	Safety Objectives, Dose Limitation And Optimization of Protection And Safety 2.1. Safety Objectives 2.2. Application of Dose Limits into design 2.3. Dose Constraint 2.4. Optimization of protection and Safety	Dose constraint is used for the optimization of radiation protection, therefore, may be included. Furthermore, it is also mentioned at para 2.2 & 2.3 in NS-G-1.13.	X			
PAK 3 WASSC	Section 3.3, Table of Contents	Section 3.3 may be modified as: 3.3 Design consideration for operation 3.4 Design consideration for Accident Conditions	Section 3.3 may be split into two sections to make it in line with section 4 and 5 which are given separately.	X			
PAK 4 WASSC	Table of Contents	New section may be included: 6. SPECIFIC DESIGN FEATURES OF RADIATION PROTECTION IN DESIGN FOR DECOMMISSIONING	This heading is missing, may be included.	X			
PAK 5 WASSC	Section 6 of Table of Contents	6.4 Effluent Monitoring	May be included as the contents does not give information on effluent monitoring as it is mentioned in section 7 of NS-G-1.13.	X			
PAK 6 WASSC		Auxiliary Facilities as mentioned in NSG 1.13 may be included.	The provision of Auxiliary facilities in design of NPPs are necessary for radiological control and limiting the spread of contamination.	X	DS440 was included in List of References		

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ENNIS EPRReSC		<p>1. I have no specific scope of this DPP document as the practices are better reviewed by other SC's as the requirements are not in the skill set of an EP SQEP</p> <p>2. The absences of reference to the Part 7 requirements is important for this document as this will provide the basis for reviewing and adjusting the scope of the emergency arrangements.</p> <p>3. The objectives of the document should be updated to relate the outcome of the RP design assessment to the basis of developing or reviewing the capability of the emergency response.</p> <p>4. In summary high level impact EPRReSC test for operating organization : <i>Does this document affect or contribute to the basis or scope of EP&R?</i> YES currently the opportunity to provide detail for the EP operational organizations is missing</p>				X	GSR Part 7 is included
				X	RP design assessment to the basis of developing or reviewing the capability of the emergency response will be included into the document		

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		<p><i>Does the document make the use of the emergency response arrangements more or less likely?</i> Probably not</p> <p><i>Does the document require any changes to the emergency arrangements in terms of mitigation actions?</i> Indirectly currently as there is no reference to the requirements of Part 7 for instance requirements 4;7;8;9;11;14, once the document DS494 requirements have been met additional actions of preventing escalation of plant conditions could evolve and to the extent of countermeasure to prevent exposure to people and the environment</p>					