TITLE: DS440

COMMENTS BY REVIEWER Reviewer: Page Country/Organization: France – ASN/IRSN Date: 26/10/2018				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	3.5	Each system providing an essential service should have the capacity, ~~capability to act autonomously~~, availability, ~~robustness~~ and reliability that is commensurate with the associated safety function(s) and with the maximum required demands of the systems that it supports, with appropriate margins	Robustness is a general word not clearly defined. Its use does not provide any guidance "capability to act autonomously" is not clear. Does it mean "autonomy" (why not using this word?) The intrinsic maximum demands is not necessary, only required demand is necessary		X Each system providing an essential service should have the capacity, autonomy time and reliability that is commensurate with the associated safety function(s) and with the maximum ~~required~~ necessary demands of the systems that it supports, with appropriate margins		"Autonomy" has been used as suggested – but amended to "autonomy time" which is the intended meaning and is scalable, i.e. it can be commensurate with the safety functions. 'required' is used only when referring to a safety requirement ; therefore, it is replaced by necessary.

COMMENTS BY REVIEWER Reviewer: Country/Organization: France – ASN/IRSN			Page Date: 26/10/2018	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2.	3.6	Consider deletion Or At a minimum, following modifications: For nuclear power plants relying on ~~passive safety features, most of the safety systems rely~~ on the driving forces of buoyancy, gravity and stored energy sources to perform a safety function, ~~This means that they~~ containing ~~no~~ less active components (for example, no pumps) ~~and any valves are operated by either air pressure or DC electric power from batteries, or else are check valves actuated by the pressure differential across the valve. For such designs~~, there might be much less need for safety classified auxiliary systems and supporting systems to support the safety functions.	3.6 does not provide any guidance and passive systems is still a disputable topic except absence of pump, fan… According to glossary "safety feature" refers to DEC (or potentially to "safety systems support feature"). Moreover, a feature is not equivalent to a system. Most of passive systems contain active components (such as valves) Valves are active components according to IAEA safety glossary		X For nuclear power plants relying on the driving forces of buoyancy, gravity and stored energy sources to perform a safety function, and containing less active components (for example, no pumps), there might be much less need for safety classified auxiliary systems and supporting systems to support the safety functions.		More clear formulation. There is need to keep para. 3.6 to reflect on other designs that rely more on passive systems.

COMMENTS BY REVIEWER Reviewer: Country/Organization: France – ASN/IRSN			Page Date: 26/10/2018	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3.	3.11	A design basis should be defined for every structure, system and component and should take into account the following (see 3.12 to 3.79): • xxx	The bullet list should use the same wording and the same topics as the "subtitles" from 3.12 to 3.79. If not, consider deletion of the list which provides no guidance		X 3.1. A design basis should be defined for every structure, system and component and should take into account the following (see paragraphs 3.12 to 3.79): • The safety function(s) to be performed by the structure, system or component; • xxxxx		The bullet should be unchanged in order to be informative. If we put only the titles of the sub-sections, there is no need to put the bullets.

COMMENTS BY REVIEWER Reviewer: Country/Organization: France – ASN/IRSN			Page Date: 26/10/2018	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
4.	3.12	The safety function(s) to be fulfilled by an auxiliary system or supporting system and the contribution of each ~~major~~ component important to safety should be described at a level of detail sufficient for a correct safety classification.	The definition of "major" component does not exist. Another proposal could be "relevant component"	X			
5.	3.13	The design of the plant ~~auxiliary systems and supporting systems within the scope of this Safety Guide~~ should be ~~designed~~ such that a failure of the auxiliary systems and supporting systems would not lead to a postulated initiating event; ~~alternatively~~, if it is foreseeable, the design should include appropriate measures for the mitigation of such an event, with account taken of the effects of the failure of the auxiliary system or supporting system on other plant systems.	Considering that AS&SS is necessary for a safety function, the failure could be by nature a PIE. Thus, it is the general reactor design which could be such as the failure of AS&SS would not lead to PIE. According to SSR-2/1 req 16 and SSR-2/1 art.5.6, the foreseeable failure of any system should be considered as a PIE	X			

COMMENTS BY REVIEWER Reviewer: Country/Organization: France – ASN/IRSN			Page Date: 26/10/2018	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
6.	3.15	~~A list of typical internal hazards usually considered is provided for guidance; however, this list should be supplemented as needed to include design specific hazards relevant for the SSC of AS&SS:~~ ~~- Breaks in high energy systems likely to jeopardize the performance of the SSC of AS&SS;~~ ~~- Heavy load drop;~~ ~~- Internal missiles;~~ ~~- Fires and explosions;~~ ~~- Flooding;~~ ~~- Electromagnetic interferences.~~	SSR-2/1 proposes a different list. There are other guides dedicated to hazards with list (for example DS 494). This list is not relevant within DS 440 and may lead to inconsistency with other guides.			X	Paragraph 5.16 of SSR-2/1 (Rev.1) provides examples of internal hazards and not an exhaustive list. Moreover, the list proposed in DS440 is not exhaustive too (please consider the second sentence of para. 3.15) and is consistent with the list adopted for DS494.

COMMENTS BY REVIEWER Reviewer: Country/Organization: France – ASN/IRSN			Page Date: 26/10/2018	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
7.	3.16/3.17	Layout and design provisions should be provided to protect the structures, systems and components of auxiliary systems and supporting systems according to ~~against the effects of the postulated internal hazards, for example:~~ ~~(a) The …;~~ ~~(b) …;~~ ~~(c) …;~~ ~~(d) ….~~ ~~3.17. More detailed~~ recommendations ~~are~~ provided in [3] and [5].	There is nothing specific to AS&SS in 3.16. DS 494 should also be mentioned after publication			X Although the comment is rejected, the reference to paragraph 3.7 of DS440 is reflected as follows: Layout and design provisions should be provided to protect the structures, systems and components of auxiliary systems and supporting systems against the effects of the internal hazards to be considered accordingly to para. 3.7, for example and when relevant: (a) The …; (b) …; (c) …; (d)….	Section 3 was developed for other systems (e.g. containment structure and systems (DS482) and the reactor coolant systems (DS481)). Based on the reasons explained in para 3.7 of DS440, this section 3 was discussed and adapted to auxiliary systems and supporting systems. The similar paragraphs in DS481and DS 482 have been approved to go to the CSS. Based on the key para. 3.7 of DS440, there is no reason to remove them for DS440.

COMMENTS BY REVIEWER Reviewer: Country/Organization: France – ASN/IRSN			Page Date: 26/10/2018	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
8.	3.19	Auxiliary systems and supporting systems needed to ensure the operation of systems necessary to mitigate accident conditions should be designed to withstand ~~the SL-2 design basis earthquake and~~ or should be protected against the effects of ~~other~~ external hazards and against common cause failure mechanisms that could be generated by those hazards consistently with the required systems with due consideration of the AS&SS function.	Earthquake is not the only hazard for which it is possible to design a SSC that could withstand it If the supported system does not need to consider hazard, there is no need to consider hazard for corresponding AS&SS The role is important. For example, if the role of the system is to cool temperature, there is no need to consider extreme low temperature		X Auxiliary systems and supporting systems needed to ensure the operation of systems necessary to mitigate accident conditions should be designed to withstand ~~the SL-2 design basis earthquake and~~ or should be protected against the effects of ~~other~~ design basis external hazards and against common cause failure mechanisms that could be generated by those hazards consistently with the necessary systems and with due consideration of the AS&SS function.		More clarity and consistency between 3.19, 3.20 and 3.21. The comment is globally accepted. However, the last paragraph of the 'Reason' is questionable as consideration of extreme low temperature is needed to avoid freezing of water necessary for cooling.

COMMENTS BY REVIEWER Reviewer: Page Country/Organization: France – ASN/IRSN Date: 26/10/2018				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
9.	3.20	Any structure, system or component whose failure could compromise the operation of the auxiliary systems and supporting systems described in para. 3.19 should be consistently designed ~~to withstand the SL-2 design basis earthquake and~~ or should consistently be protected against the effects of ~~other~~ external hazards and against common cause failure mechanisms that could be generated by those hazards	See above		X Any structure, system or component whose failure could compromise the operation of the auxiliary systems and supporting systems described in para. 3.19 should consistently be ~~consistently~~ designed ~~to withstand the SL-2 design basis earthquake and~~ or should consistently be protected against the effects of ~~other~~ design basis external hazards and against common cause failure mechanisms that could be generated by those hazards		Consistency in the wording

COMMENTS BY REVIEWER Reviewer: Country/Organization: France – ASN/IRSN			Page Date: 26/10/2018	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
10.	3.21	Any SSC of AS&SS whose failure could initiate accident conditions should be designed to withstand ~~the SL-2 design basis earthquake (DBE) and~~ or should be protected against the effects of ~~other~~ design basis external hazards and against common cause failure mechanisms that could be generated by those hazards.	See above	X			
11.	3.27	With regard to external flooding, either all the structures hosting the systems described in para. 3.26 should be located at an elevation higher than the elevation of the design basis flood, or else adequate ~~safety features~~ provisions (e.g., water tight doors) are required to be provided in	According IAEA glossary, "safety feature" is dedicated to DEC	X			

COMMENTS BY REVIEWER Reviewer: Country/Organization: France – ASN/IRSN			Page Date: 26/10/2018	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
12.	3.31	Consider deletion or When considering multiple failures leading to design extension conditions, the failure of auxiliary systems and supporting systems that support safety systems~~, or that support safety features for design extension conditions~~, should be taken into account	It is not the scope of this guide to explain how to establish the list of DEC event Multiple failure events are yet DEC. Thus, it does not really make sense to consider multiple failure of safety features (used for DEC) to define multiple failure event for DEC		X When considering multiple failures leading to design extension conditions, the failure of auxiliary systems and supporting systems that support safety systems, or that support safety features for design extension conditions without significant fuel degradation, should be taken into account.		For the first part of the reason, please refer to the explanation in the resolution of comment No. 7. Regarding the second part of 'Reason', the failure of safety features for DEC without significant fuel degradation could be considered to define DEC with core melting.
13.	3.40	~~A reliability analysis of the auxiliary systems and supporting systems that support safety systems designed for given safety functions should be undertaken to identify the need for additional safety features to fulfil these safety functions~~	The expectation of this recommendation is not understandable Moreover, it is not the scope of this guide to explain how to establish the list of safety features on the basis of DEC event			X	Please refer to the resolution of comment No.7.

COMMENTS BY REVIEWER Reviewer: Country/Organization: France – ASN/IRSN			Page Date: 26/10/2018	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
14.	3.41	~~The more likely combinations of postulated initiating events and common cause failures in redundant safety systems should be analysed. If the consequences exceed the limits for design basis accidents, the vulnerabilities should be removed or additional design features should be implemented to cope with such situations. The additional features for the safety functions that are reactor technology and design dependent should be designed and installed such that they are protected against common cause failures.~~	The link between this recommendation and AS&SS is not clear This article is not in the scope of the guidance			X	Please refer to the resolution of comment No. 7, with reference to paragraph 3.54 of DS481 and paragraph 3.65, bullet (b) of DS482. The link with auxiliary systems and supporting systems can be explained as follows: the common cause failure of redundant safety systems could be either directly in supporting systems (credited in DBA) or in supporting systems while supporting safety systems and inducing their failure.

COMMENTS BY REVIEWER Reviewer: Country/Organization: France – ASN/IRSN			Page Date: 26/10/2018	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
15.	3.52	… If part of a supporting system is supporting safety systems or safety features of different safety classes, this part should have the ~~same~~ safety class ~~as~~ commensurate with the system or component having the highest safety class	To be consistent with the first sentence		X If part of a supporting system is supporting safety systems or safety features of different safety classes, this part should have a ~~the same~~ safety class ~~as~~ commensurate with the system or component having the highest safety class.		Better formulation.
16.							

Design of Auxiliary and Supporting Systems for Nuclear Power Plants

DS440, Step 11, Version dated September 24, 2018

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)** (with comments of GRS) Pages: 3 Country/Organization: **Germany** Date: 22.10.2018				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	2.5 (a)	The auxiliary systems and supporting systems addressed in this Safety Guide, as defined in para. 2.2, do not include those systems that are (or are intended to be) addressed in other Safety Guides. For example: ~~(a) Heat transport systems (Requirement 70 of SSR-2/1 (Rev.1) [1]) are addressed in IAEA Safety Standards Series No. DS481, Design of the Nuclear Coolant System and Associated Systems in Nuclear Power Plants [3];~~ …..	This is in contradiction to 2.6 (b). In fact this guide treats heat transport systems.		X The comment is accepted with the following modifications in 2.2 (a) and 2.6 (b): 2.2 (a)Heat transport systems (Requirement 70 of SSR-2/1 (Rev.1) [1]) removing residual heat are addressed in detail in IAEA Safety Standards Series No. DS481, Design of the Nuclear Coolant System and As-		Only heat transport systems not considered in DS481 are briefly addressed in DS440. This was done in coordination with the Technical Officer in charge of DS481.

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)** (with comments of GRS) Pages: 3 Country/Organization: **Germany** Date: 22.10.2018				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					sociated Systems in Nuclear Power Plants [3]; 2.6 (b) Heat transport systems (Requirement 70 of SSR-2/1 [1]) that are not considered in DS481.		
2	2.5 (d)	The auxiliary systems and supporting systems addressed in this Safety Guide, as defined in para. 2.2, do not include those systems that are (or are intended to be) addressed in other Safety Guides. For example: ….. (d) Radiation protection ~~and radiation monitoring systems~~ (Requirements 81 ~~and 82~~ of SSR-2/1 (Rev.1) [1]) are addressed in IAEA Safety Standards Series No. NS-G-1.13 [5], Radiation Protection Aspects of Design for Nuclear Power Plants.	This is in contradiction to 2.6 (d). In fact this guide treats radiation monitoring systems.	X			Initially, the radiation monitoring system was not specifically addressed; it was embedded in the Section on 'Process and post-accident sampling system'. Following Belgium comment to separate process and post-accident sampling system and process radiation monitoring

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)** (with comments of GRS) Pages: 3 Country/Organization: **Germany** Date: 22.10.2018				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
							system, a specific section was created for the latter, without reflecting it in Section 2.
3	4.188	The use of overhead lifting equipment should be prevented ~~in the event of an accident~~ under conditions that could result in unplanned radioactive releases in case of an accident (see also para. 6.55 (d) of SSR-2/1 (Rev. 1) [1]). For example, an interlock on the crane of the spent fuel cask transfer can prevent the crane from being used when the fuel building door is open.	The requirement deals with situations with a risk of an unplanned release in case of an accident. The general requirement is given in 6.55 (d) of SSR-2/1 that is erroneously cited in 4.189.	X			The comment is accepted although the second part of the reason cannot be accepted (see resolution of Comment No.4)
4	4.189	The design of overhead lifting equipment should be such that the load can be lowered by manual operation or other emergency procedures in the event of loss of power, loss of motive torque or mechanical failure ~~(see also para. 6.55 (d) of SSR-2/1 (Rev. 1) [1])~~.	Manual operation might neither be practical nor safe in case of heavy loads. The citation of 6.55 (d) of SSR-2/1 rather belongs to 4.188.			X	What kind of emergency procedures are automatically carried out without manual operation? We are in a plant state where there is a loss of power. I would agree in a formulation like “The design of overhead lifting equipment

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)** (with comments of GRS) Pages: 3 Country/Organization: **Germany** Date: 22.10.2018				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
							should be such that the load can be lowered by manual operation following emergency procedures in the event of loss of power, loss of motive torque or mechanical failure (see also para. 6.55 (d) of SSR-2/1 (Rev. 1) [1]). Reference to para. 6.55 (d) of SSR-2/1 (Rev.1) is correct because loss of power could be one of the specified plant states mentioned in para. 6.55, bullet (d).
5	4.195	Overhead lifting equipment inside the containment ~~(especially the girder and crane track)~~ should be ~~designed taking into account the complementary loads~~	What kind of mechanical impact should be assumed as complementary load from a LOCA? Small / medium size LOCA will			X	Complementary loads to be assumed are for example pressure loads (as high as

COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)** (with comments of GRS) Pages: 3 Country/Organization: **Germany** Date: 22.10.2018				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		~~resulting from~~ environmentally qualified for the ambient conditions that could be created within the containment by a loss of coolant accident.	have little mechanical impact. Large LOCA are very unlikely so a simultaneous use of the lifting equipment might not be assumed. It is more important that the equipment will function in the ambient conditions of increased temperature and humidity during and after a LOCA.				several bars) that can result from large break LOCA.
6	4.197	Design provisions should be implemented in such a way that the ~~polar~~ cranes that might be contaminated ~~has~~ have strippable or smooth surface paint or coatings that facilitate the decontamination of potentially contaminated surfaces.	This is a reasonable requirement for any crane that might be contaminated.	X			

Japan NUSSC comments on DS440 "Design of Auxiliary Systems and Supporting Systems for Nuclear Power Plants"

COMMENTS BY REVIEWER Reviewer: Japan NUSSC member Page.... of 2 Country/Organization: Japan/NRA Date: 2 Nov. 2018				RESOLUTION			
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	4.75.	The process radiation monitoring system should, as applicable: · Monitor the activity of the steam generator in order to detect an unacceptable steam generator tube leak and to determine the necessity to initiate isolation actions on the affected steam generator (PWRs and PHWRs only); · During the cold shutdown, monitor the activity inside the containment and the fuel buildings, including the reactor building for BWRs, in order to detect a fuel handling accident that would necessitate an evacuation alarm and actions for confinement of radioactive material;	Completeness. The current description seems to be based on PWR/PHWR(maybe) design but not BWR. In addition, in BWR, the operating floor in the reactor building, that is outside the containment vessel, also has risk for fuel handling accident.		X · Monitor the activity of the steam generator in order to detect an unacceptable steam generator tube leak and to determine the necessity to initiate isolation actions on the affected steam generator as applicable. ~~(PWRs and PHWRs only)~~; X During the cold shutdown, monitor		It is known that BWRs do not have steam generators. To avoid complicating the recommendation, 'as applicable' is added to mean as applicable to PWR and PHWR. More general formulation that can be applied to

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COMMENTS BY REVIEWER Reviewer: Japan NUSSC member Page.... of 2 Country/Organization: Japan/NRA Date: 2 Nov. 2018				RESOLUTION			
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					the activity inside the containment ~~and~~ the fuel buildings, and any building where a fuel handling accident could occur ~~including the reactor building for BWRs,~~ in order to detect ~~a fuel handling~~ such an accident that would necessitate an evacuation alarm and actions for confinement of radioactive material;		all water cooled reactors.
2.	4.82.	For the protection of operating personnel, continuous monitoring of the atmosphere of the containment, including the reactor building for BWRs, should be provided to allow actions to be taken and to trigger an alarm for	Completeness. In BWR, the operating floor in the reactor building, that is outside the containment vessel, also has risk for fuel handling accident.		X For the protection of		See resolution of previous comment. In addition, in the proposed formulation

COMMENTS BY REVIEWER Reviewer: Japan NUSSC member Page.... of 2 Country/Organization: Japan/NRA Date: 2 Nov. 2018				RESOLUTION			
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		the evacuation of personnel, in particular, in the event of a fuel handling accident. In addition, surface contamination should be monitored in all areas containing large amount of radioactive liquids and solid radioactive waste.			operating personnel, continuous monitoring of the atmosphere of the containment and other buildings where radioactive releases could occur, ~~including the reactor building for BWRs,~~ should be provided to allow actions to be taken and to trigger an alarm for the evacuation of personnel, in particular, in the event of a fuel handling accident. In addition, surface		'including' is incorrect as it suggests that the reactor building is part of the containment, which is in contradiction with what is proposed.

COMMENTS BY REVIEWER Reviewer: Japan NUSSC member Page.... of 2 Country/Organization: Japan/NRA Date: 2 Nov. 2018				RESOLUTION			
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					contamination should be monitored in all areas containing large amount of radioactive liquids and solid radioactive waste.		
3.	4.86.	To ensure the habitability of the main control room in the event of radioactive contamination of the site, process radiation monitoring system should monitor the main control room air ~~inlet~~ and actuate the iodine and particulate filters of the main control room ventilation (see paras 4.169–4.175).	Don't need to specified "inlet" here.			X	The monitoring is made at the air inlet in many designs, e.g. in EPR design.
4.	4.147. (b)/ L3	During normal operation, before the entry of personnel inside the containment, the system reduces the level of radioactive ~~noble~~ radioactive gases in the service area atmosphere.	Since the HVAC can reduce the level of radioactive gases by ventilating, it does not need to limit for noble gases.		X During normal operation, before the entry of personnel inside the containment, the system reduces the level of radioactive		Radioactive is repeated two times.

COMMENTS BY REVIEWER Reviewer: Japan NUSSC member Page.... of 2 Country/Organization: Japan/NRA Date: 2 Nov. 2018				RESOLUTION			
No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
					~~noble radioactive~~ gases in the service area atmosphere.		
5.	4.165.	The ventilation system for the main control room or an associated system should be capable of removing cold smoke in the event of fire within the control room.	During fire, the ventilation system should be stopped in order to prevent the fire spreading. Therefore, the smoke purging system should be activated after the fire is extinguished.			X	'cold smoke' cannot be defined precisely. So, consistently with NS-G-1.7 where 'cold smoke' terminology was never used, it is better to keep the wording as it is, bearing in mind that we are speaking about residual smoke after fire extinguishing, without any reference to cold or hot smoke.

Comments on IAEA Draft Safety Guide
[SPESS Step 11]
***Design of Auxiliary Systems and Supporting Systems for NPPs* (DS440)**

COMMENTS BY REVIEWER Reviewer: US Nuclear Regulatory Commission Country/Organization: United States of America/US NRC Date: 1 Nov 2018				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	Figure 1, Page 10	Figure 1 General Comments: a.) Right side, dotted box – Clarify whether requirements 70 and 77 of SSR-2/1 Rev.1 (Heat Transport Systems, and Steam Supply System and Feedwater System, respectively) should be within the scope of this safety guide. The explanation in the Figure 1 dotted box excludes only Requirement 74 from the scope of DS440.	a) Sub-items a, b and c of Item 2.2 on page 8 explain that Requirements 70, 74, and 77 are addressed in DS481 and not in the scope of DS-440. However the note in the dotted box seems to indicate otherwise.		X The note in the dotted line box is amended as follows: **Remaining auxiliary systems and supporting systems within the scope of this Safety Guide** Reqs 69–79 (excluding Req. 74, 77 and partially Req. 70) plus other appropriate requirements, including Req. 27 (support service systems) and Req. 37 (communication systems)		Only heat transport systems that are not considered in DS481 are briefly addressed in DS440. This was done in coordination with the Technical Officer in charge of DS481. Contrary to what is written in 'Reason' (4th column), it was never said that Requirement 74 (fire protection) is addressed in DS481.

		b) The purpose for the dotted right hand box is unclear	b) Solid boxes versus single dotted box: the purpose for this box being dotted should be explained.		X		The dotted right hand box is precisely the one for auxiliary systems and supporting systems. The content was amended as above.
2.	3.19. Page 14	"…should be designed to withstand the SL-2 design basis earthquake (an earthquake where the minimum level should correspond to a peak ground acceleration of X.Xg)…."	SL-2 is not defined or referenced. It would be best to define SL-2 here, or add an NS ref. SL-2 is noted 11 times in this document, but was not noted in the Step 8 version			X	SL-2 is well defined in NS-G-1.6 (that is referenced as Ref. [10] of DS440) and there is no need to define it here. Please note that SL-2 was also used, for example in DS481, without further definition. Anyway, reference to SL-2 is now removed to answer other comments (France comments No. 8,9 and 10).

3.	3.23, Page 15	"…and the design and construction codes used should provide adequate margins to avoid cliff edge effects (add a footnote here) in the event of a…."	For clarity, it would be better to define the meaning of cliff edge effects, as it is not a commonly used term in the U.S. Suggest use of this definition from a footnote in SSR-2/1: "A cliff edge effect", in a nuclear power plant, is an instance of severely abnormal plant behaviour caused by an abrupt transition from one plant status to another following a small deviation in a plant parameter, and thus a sudden large variation in plant conditions in response to a small variation in an input. The term 'plant parameter' in the definition of cliff edge effect, needs to be interpreted in a broad sense, as any plant physical variable, design aspect, equipment condition, magnitude of a hazard, etc., that			X	Cliff edge effect is defined in SSR-2/1 (Rev.1), footnote No.9, page 15, and also in the IAEA Safety Glossary. Moreover, it was used, without definition, in many other safety guides that are in final stage of approval process.

			can influence equipment or plant performance."				
4.	Various sections	General word usage comment: The word "owing" was not used in the Step 8 version, but it can be found in 3 locations of this Step 11 version: sections 3.36, 4.2, and 4.40.	Suggest replacing with another phrase, such as "with respect to"…..			X	'owing' was introduced by the Technical Editor and I agreed on these modifications that are correct and need not to be replaced.
5.	Various sections	In Section 4.47, modify the text to read: "…as well as the containment atmosphere (and for boiling water reactors, the drywell atmosphere) and the secondary system." In Section 4.53, modify the text to read: "…the reactor coolant and associated auxiliary systems and supporting systems (e.g. the moderator and its auxiliaries for pressurized heavy water reactors), and in the containment atmosphere (and for boiling water reactors, the drywell atmosphere) and secondary system, are being maintained." In Section 4.69, modify the text to read: "This includes samples from the reactor coolant, the containment sump and the containment atmosphere (and for boiling water reactors, the drywell atmosphere), for example to provide information on the pH of recirculating water, and the concentration of hydrogen and fission products within the containment and drywell atmospheres." In Section 4.77, modify the text to read: "…	Add the phrase "drywell atmosphere" to "containment atmosphere" to account for BWR terminology.			X	In DS482 that is going this week for approval by the CSS and that is a safety guide dedicated to the containment of PWR, HWPR and BWR, the wording 'containment atmosphere' was used several times, without specification of drywell atmosphere for BWRs. It is understood that 'containment atmosphere' means 'drywell atmosphere' for BWR, and there is no need for further specification.

		radioactivity of fluids (e.g. the reactor coolant and containment atmosphere, and for boiling water reactors the drywell atmosphere) that are in contact with...” In Section 4.81, modify the text to read: “…to enable the assessment of the radiological release into the containment atmosphere, and for boiling water reactors, the drywell atmosphere.”					
6.	4.69	In Section 4.69, modify the text to read: “…from the reactor coolant, the containment sump, the drywell sump (BWRs), and the …”	Add “drywell sump (BWRs)” to account for BWR terminology			X	In DS482 that is going this week for approval by the CSS and that is a safety guide dedicated to the containment of PWR, HWPR and BWR, the wording ‘containment sump’ was used without specification of drywell sump. It is understood that ‘containment sump’ means ‘drywell sump’ for BWR, and there is no need for further specification.