Draft Safety Guide DS482 "Design of the Reactor Containment and Associated Systems for Nuclear Power Plants" Step 11c, 4 Sept. 2017

	Reviewer: **Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)** (with comments of GRS) Pages 5 Country/Organization: **Germany** Date: 02.11.2017				RESOLUTION			
Relevanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1	2.9	In accordance with Requirement 58 of SSR-2/1 (Rev. 1) [1], the systems designed to ensure that the specified design limits of the containment (e.g. in relation to pressure, temperature and combustible gases) will not be exceeded are required to be implemented, as necessary, to preserve the containment structural integrity in accident conditions. Multiple means are <u>required to be</u> implemented to remove heat from the containment in accident conditions. The systems specifically dedicated to addressing design extension conditions with core melting are required to be independent of safety systems as far as practicable (see Requirement 7 of SSR-2/1 (Rev. 1) [1]).	In the second sentence the phrase "are require to be" is missing. It was already added to many other sentences.	X			
1	3	Page 16/17	**Safety features for design extension conditions without significant fuel degradation** **Safety features <u>for design extension conditions</u> ~~implemented to mitigate the consequences of an accident~~ with core melting**	Harmonize both headlines for clarity.	X			

Relevanz: 1 – Essentials | 2 – Clarification | 3 – Wording/Editorial

	Reviewer: **Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)** (with comments of GRS) Pages 5 Country/Organization: **Germany** Date: 02.11.2017				RESOLUTION			
Relevanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	7	4.6	The design ??? should take into account the potential occupational exposure due to implementing.actions in the emergency operating procedures, due to connecting non-permanent equipment and due	The design of what? There seems to be something missing and something unclear in general: Typically emergency operating procedures are not known at the stage when a containment is designed, so that they cannot be considered? What is meant here? The same is true for non-permanent equipment connections.			x	"Design" refers to the scope of this safety Guide.
1	8	4.13 and 4.14	**Sharing of parts of the containment system between units** .... 4.13. ~~As stated in Requirement 33 of SSR-2/1 (Rev. 1) [1]: "~~Each unit of a multiple unit nuclear power plant shall have its own safety systems and shall have its own safety features for design basis accidents and for design extension conditions (Requirement 33 of SSR-2/1 (Rev. 1) [1]). ~~As an example of meeting this requirement, the gas treatment sys-~~	The head line suggests that recommendations are taken for sharing of parts of the containment system between units under all plant states; but only conditions are described in 4.13. with regard to DEC. The sentence should be extended to cover DBA as well and the example			X	The example was added to answer comment from Japan.

Relevanz: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Reject-ed	Reason for modification/rejection
			~~tem, including the exhaust line operated in accident conditions, should not be shared.~~ 4.14. Means allowing interconnections between units of a multiple unit nuclear power plant could ~~should~~ be installed if needed to facilitate the management of accidents ~~not considered in the design~~ under design extension conditions with core melt. An example of this is connections to refill containment water storage tanks.	should be deleted. 4.14. allows to interconnect the units in case of accidents not considered in the plants design - does this include DEC for which the plant is designed? What is the intention - to allow interconnection of units under DEC with core melt?				"could" indicates a possibility, "should" a recommendation. "should" is here appropriate. Means allowing interconnections between units are expected to prevent accident with core melting. More generally to facilitate the operation of the plant in case of conditions not retained for the design.
1	10	4.149	One possible way to avoid hydrogen combustion is maintain an inert atmosphere (usually with nitrogen) inside the containment during reactor operation and during accidents. This is mainly applicable to small containments.	Inert conditions are needed in case of normal plant operation, accidents and severe accidents with core melting.			X	See 4.150.
1	11	4.204	Adequate instrumentation should be provided for the purposes of: 4.204. - Monitoring the stability of the con-	Accident monitoring is not mentioned in the list, but in 4.205 and in			X	Included in "detection of deviations" and in "initiation of auto-

Relevanz: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

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Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as fol-lows	Reject-ed	Reason for modifica-tion/rejection
			tainment; - Detection of deviations from normal operation; - Periodic testing; - Monitoring the availability of the con-tainment systems; - Initiation of automatic operation of systems; - Accident - and Post-accident monitor-ing.	a separate sub-chapter on page 62. It should be added in the list here.				matic actions".
1	12	4.212	Appropriate instrumentation should be incorporated inside the containment for an early detection of deviations from normal operation including the follow-ing: - Leaks of radioactive material; - Abnormal radiation levels; - High energy leaks; - Leaks of primary or secondary cool-ant; - Fire; - Failure of components.	If "leaks" is more de-tailed, leaks of second-ary coolant might be added, too.			X	A primary to second-ary leak cannot be detected by the in-strumentation imple-mented in the free volume of the con-tainment.
1	13	4.236	For the determination of the plant status in the event of an accident and for the management of accidents, appropriate instrumentation displays and records should be available in the main control room and the emergency response facil-ity to allow personnel to diagnose the situation and to decide and to take the	EOPs and especially SAMGs are the docu-ments used in current plants for accident con-ditions. New plants are designed as well for DEC and will have ded-icated systems which			X	For NPPs with dedi-cated systems to cope with severe accident, instructions are in-cluded in comple-mentary EOPs.. If not the document can also be tittled SAMG

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Relevanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			~~manual~~ <u>appropriate</u> protection actions <u>according the plants design. The actions might be</u> specified in the emergency operating procedures or in the severe accident management ~~guidelines~~ <u>related documents.</u> - … d) Process parameters to implement actions specified in the emergency procedures or severe accident management ~~guidelines~~ <u>related documents</u> (process parameters to control the pressure and to maintain the conditions inside the containment below the specified limits);	must be used under DEC conditions. SAMGs might not exist as in current plants. The documents might be called different. The relevant sentences should be more general.				. It is just a question of practice/definition within the Operating organization.
1	15	5.31	**Periodic tests** The design should provide a capability for testing safety systems and systems implemented to cope with design extension conditions at intervals that reflect their importance to safety~~. The design should also provide a capability for other testing for otherwise demonstrating the necessary reliability for the containment systems~~ individually or as a whole.	Second sentence is corrupt, content is not clear. A proposal is made to link both sentences.			X	This paragraph has been deleted (similar to 5.20 and 5.21.

Relevanz: 1 – Essentials 2 – Clarification 3 – Wording/Editorial

FR COMMENTS – DS 482 - DESIGN OF THE REACTOR CONTAINMENT AND ASSOCIATED SYSTEMS FOR NUCLEAR POWER PLANTS

COMMENTS BY REVIEWER Reviewer: G. DANDRIEUX Page.1 of 1 Country/Organization: Ministry for an ecological and solidary transition. Department for nuclear security Date: 2017-10-03				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	4.5	Nuclear security recommendations on the prevention of access to non authorized persons from ~~the containment and the buildings that house the associated~~ systems important to safety should also be considered and implemented in an integrated manner with the recommendations for safety, as described in paras 2.15 and 3.2, and Ref. [10].	Prevention of access non authorized person not only relates to buildings but also to systems themselves	X			

DS482

DESIGN OF THE REACTOR CONTAINMENT AND ASSOCIATED SYSTEMS FOR NUCLEAR POWER PLANTS

COMMENTS BY REVIEWER Reviewer: Moustafa Aziz Page.... of.... Country/Organization: Egypt Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	Para 4.80 Page 38	**Containment heat removal systems should be designed to remove heat from the containment 4.80.and to transfer heat to the (containment heat sink) atmosphere, or to the sea or a river.**	Containment heat sink replaces atmosphere or any other places		X 4.1. transfer heat to a cooling chain or directly to the ultimate heat sink (e.g. atmosphere, or to the sea or a river).		

	Reviewer: **Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)** (with comments of GRS) Pages 2 Country/Organization: **Germany** Date: 02.11.2017				RESOLUTION			
Rele-vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2	2	3.36	For design extension conditions without significant fuel degradation, in general, the following three types of failures should be considered:	Missing word.	X			
3	4	3.75	(b) Systems implemented to provide a backup to safety class 1 systems for design extension conditions should be assigned to at least ~~in~~ safety class 2; (c) Systems necessary to preserve the containment integrity in the event of an accident with core melting should be assigned to at least ~~in~~ safety class 3 (e.g. ex-vessel core cooling system,	Editorial	X X			
2	5	4	**4. DESIGN OF THE CONTAINMENT ~~STRUCTURE~~ AND ITS ASSOCIATED SYSTEMS**	Harmonize the head line with the title of the safety guide	X			
2	6	4.3	The layout and configuration of the containment ~~structure~~ and its associated systems are design dependent and are significantly different for reactor technologies relying on containment with a large dry volume compared to those technologies relying on containment with a suppression pool.	Harmonization of wording as everywhere in the safety guide	X			
3	9	4.36	Design margins should be provided by one or both of the following: - Limiting stresses and deformations to	Editorial	X			

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			a specific fraction~~s~~ of the ultimate limit for that material; …					
3	14	Page 68	**Integrated leak rate tests of the containment envelope**	Use the same head line as before; a leak rate test is meant	X			

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	General	Check throughout DS482 that “containment structure” or “containment envelope” or “containment building” is used only when relevant	In most occurrences, “containment structure” has been replaced by “containment”. Nevertheless, “containment structure” does still appear occasionally. Consistency with IAEA Safety Glossary	X			
2.	General	Check throughout DS482 that “containment” or “containment and associated systems” are used as appropriate	It seems that, from time to time, using “containment and associated systems” would be more appropriate than using “containment” alone	X			
3.	General	Check throughout DS482, when DBA only are mentioned, whether DEC should also be mentioned, and vice-versa. This is for example the case for 4.20, 4.21, 4.109, 4.163, 4.182. It may also be the case for 4.72 related to BWR but France is not familiar with BWR.	Both DBA and DEC have to be taken into account for the design of the containment and associated systems.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
4.	1.2	Before 1.2, insert the following paragraph : "As established in the IAEA Safety Glossary [2], for the safety of nuclear installations: • confinement is the "prevention or control of releases of radioactive material to the environment in operation or in accidents"; • containment is the "methods or physical structures designed to prevent or control the release and the dispersion of radioactive substances." • containment system is "a structurally closed physical barrier (especially in a nuclear installation) designed to prevent or control the release and the dispersion of radioactive substances, and its associated systems". Confinement is closely related in meaning to containment, but confinement is typically used to refer to the safety function of preventing the 'escape' of radioactive material. Although related to confinement, containment is usually used to refer to methods or structures that perform a confinement function in facilities and activities, namely preventing or controlling the release of radioactive substances and their dispersion in the environment. Confinement is therefore the safety function that is performed by the containment."	To remind the 2016 Safety Glossary definitions.			X	No need to quote or repeat glossary definitions

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
5.	1.8 1.11	1.8 This Safety Guide addresses the functional aspects of the containment and its associated systems for the management of energy, radioactive material and combustible gases <u>of the reactor,</u> for the plant states considered in the plant design envelope1. In 1.11 Issues related to the confinement of spent fuel are outside the scope of this Safety Guide. Recommendations on these issues are provided in Design of Fuel Handling and Storage Systems for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-1.4 [3] and Storage of Spent Nuclear Fuel, IAEA Safety Standards Series No. SSG-15 [4]. <u>Issues related to the confinement of radioactive substances in building such as radioactive effluent treatment/storage building or auxiliary building are also out of the scope of this Safety Guide.</u>	It is unclear whether DS482 is only addressing the reactor building of a NPP or also the other locations were radioactive substances may be located (spent fuel building, radioactive effluent treatment building…), considering IAEA Safety Glossary definition.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
6.	2.5	For operational states, the cumulative annual effective dose received by people living in the vicinity of a nuclear installation is expected to be comparable to the effective dose due to natural background levels of radiation, i.e. the levels that originally existed at the site. ~~For public exposure in planned exposure situations, the range of values for the dose constraint recommended by GSR Part 3 [6] represents an increase of up to 1 mSv in a year above the dose received from exposure due to natural radiation sources.~~ This expectation should result in dose constraints for NPP related public exposure in operational states not higher from a few tens of µSv per year.	IN GSR Part 3, footnote 25 says that "For public exposure, the relevant dose constraint is a source related value established or approved by the government or the regulatory body, with account taken of the doses from planned operations of all sources under control. The dose constraint for each particular source is intended, among other things, to ensure that the sum of doses from planned operations for all sources under control remains within the dose limit". Formally, the up to 1 mSv increase is not recommended by GSR Part 3 as GSR Part 3 recalls the ICRP view… Considering current exposure from NPP regular operation, suggesting 1 mSv is far from a relevant constraint.		…the proposed range of values for the dose constraint indicated in GSR Part 3 [6] represents an increase…	X	See GSR part 3, item 1.25 The number of 1 mSv is not disputed by others MS (see the latest comments from ONR dated on 20 October

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
7.	2.16 2.17		Why are 2.16 and 2.17 separate from 2.5 and 2.6 as all are addressing people exposure?			X	To keep separate confinement of radioactive material in operational states and in accident conditions; and radiation shielding in operational states and in accident conditions.” as mentioned in 2.2
8.	2.17		Transform 2.17 as a footnote to 2.16. If not, reminding that dose constraints have to be established – constraints being lower than these limits – is necessary			X	In the above requirement
9.	3.7	The postulated initiating events relevant for the containment and its associated systems should include equipment failures and errors potentially leading to accident conditions with a significant release of radioactive material or with a significant release of energy inside the containment. Postulated initiating events occurring in shutdown modes, with an open containment or when <u>some</u> systems are disabled for maintenance, should also be considered.	Clarification	X			
10.	3.13	Paragraphs 3.14–3.22 provide recommendations on meeting Requirement 17 of SSR-2/1 (Rev. 1) [1] in relation to external hazards<u>, whether of a natural or human induced nature</u>.	Clarification			X	External hazards include both of them

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11.	3.22	In the case of external flooding, either all the structures hosting the systems listed in para. 3.21 should be located at an elevation higher than the one derived from the site hazard evaluation, or else adequate engineered safety features (such as water tight doors) should be in place to protect these structures and ensure that mitigating actions can be maintained. Margins taken in the elevation or flood induced loads should be such to meet the requirement quoted in para 3.20.	For consistency with §3.21			X	3.17 deals with margins More details on the safety approach with regard to external hazards should be in the scope of the relevant Safety Standard
12.	3.24	• The mechanical loading, both static and dynamic, on the containment ~~structure~~ and its subcompartments;	Is structure necessary?			X	the use of “containment” has been carefully reviewed. Here yes, the recommendation also applies to the internal structures of the containment
13.	3.44	For design extension conditions, if any, for which venting the containment would be necessary to preserve the integrity of the containment, ~~its use~~ venting should not lead to an early radioactive release or a large radioactive release (see para. 6.28A of SSR-2/1 (Rev. 1) [1])…	Clarification and consistency with §3.43			X	Ignored
14.	3.44	To do so ~~ensure that this is the case~~: • The containment venting system should be equipped…	Clarification			X	Ignored

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
15.	3.44	• The containment venting system should be designed to withstand loads from external hazards <u>(including natural hazards exceeding those considered for design, derived from the hazard evaluation for the site.”)</u> and the static and dynamic pressure loads existing when the containment venting system is operated;	Clarification and consistency with §3.20 and §3.21	X			
16.	3.47	• Dose ~~limits and dose~~ constraints for the public (see GSR Part 3 [6]), and limits on radioactive releases, specified for operational states and accident conditions; • Dose ~~limits and dose~~ constraints for workers (see GSR Part 3 [6]), and also maximum dose rates for shielding purposes	Dose constraints are below dose limits so doe limits do not need to be mentioned.			X	Dose limits also need to be specified
17.	3.54	Vulnerabilities for common cause failures between the redundancies of the safety systems should be identified, and ~~design or~~ layout provisions <u>or other design provisions</u> should be implemented to make the redundancies independent as far as is practicable.	Clarification			X	No comment from the Technical editor
18.	3.56 3.58	<u>(Additional)</u> safety features <u>for design extension conditions</u>	Consistency with SSR-2/1 and IAEA Safety Glossary			X	Clear with the headline
19.	3.59	The dedicated safety features <u>implemented to mitigate the consequences of an accident with core melting</u> should have an adequate reliability to accomplish their safety function as required.	Clarification (consistency with headline)			X	Clear with the headline

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
20.	3.60	Consider deletion of this new article or modification of the title before it "Safety features <u>or provisions</u> implemented to mitigate the consequences of an accident with core melting <u>or practically eliminate the conditions that could lead to an early radioactive release or a large radioactive</u>"	The section is "*Safety features implemented to mitigate the consequences of an accident with core melting*". The practical elimination approach is used when the consequences of accident with core melt cannot be mitigated. Moreover, safety features are dedicated to DEC conditions according to IAEA safety glossary and practically eliminated conditions are not part of DEC.			X	With "contribute" the recommendation is correct. DiD level 4 contributes to the practical elimination as well other measures taken at levels 1 to 3
21.	3.62	Recommendations related to the protection of these <u>dedicated</u> safety features with regard to the effects of internal hazards, external hazards and environmental conditions	Clarification (consistency)			X	"<u>The dedicated</u> safety features" or "<u>these safety</u> features" are possible
22.	3.69	Consider moving this article in "defense-in-depth". Consider additional word: "*<u>Relevant</u> accidents involving core melting should be postulated as design extension conditions irrespective of the design provisions taken to prevent such conditions and irrespective of their estimated probability of occurrence.*")	Practically eliminated conditions are not part of DEC "Relevant" is a necessary adjective whether there would be no limit to the safety case (full loss of the primary circuit or a meteorite would certainly lead to core melt and is not consider within DEC.			X	To stress that conditions with a core melting cannot be ruled out of the design envelope arguing they have been practically eliminated

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23.	3.74 to 3.84	Among 3.74 to 3.84 delete all paragraphs except 3.77	These paragraphs are not specific to the containment and associated systems even if applicable to them			X	A Safety guide is also published to provide guidance to achieve a safe and reliable design of the items important to safety addressed in the safety guide. E.g. 3.75 is helpful to establish a correct classification of the containment and its associated systems
24.	4.3	The layout and configuration of the containment ~~structure~~ and associated systems are design dependent 4.3.and are significantly different for reactor technologies	Consistency with IAEA Safety Glossary	X			
25.	4.6	The design should take into account the potential occupational exposure due to implementing actions in the emergency operating procedures or in severe accident management guidelines, due to connecting non-permanent equipment and due to performing maintenance on systems operated over a long period of time after the onset of the accident…	To manage the whole range of accidents, EOPs are not enough. SAMGs should also be included. Consistency with §4.236	X			
26.	4.11	In the event of an accident, to protect the containment, there should be no need for any action to be taken by the operator within a certain grace period…	Clarification (to keep focus on the Safety Guide scope)			X	ignored

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
27.	4.16	Ageing mechanisms (potentially) affecting the containment and its associated systems should be identified, taken into account in the design and incorporated into an ageing management programme…	Associated systems should also be addressed…	X			
28.	4.20	The design pressure should be higher than the value of the peak pressure that would be generated by the design basis accident with the most severe mass and energy release (i.e. the peak pressure associated with design basis accidents and the margin). The design pressure should also be consistent with the pressure that would be generated by design extension conditions, including those with core melting.	DEC, especially severe accident, should also be taken into account. Consistency with §4.35 and tables 1 and 2.		X The design pressure should be defined to be higher than the value of the peak pressure (for consistency with the recommendation on the definition of the design temperature 4.21)		*…be consistent with the pressure that would be generated by…* Does not bring much clarity As practically the containment is no longer designed with account of the design pressure only but with account of all the loads and combination of loads and the associated stress limits. The consensus was made on this recommendation.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
29.	4.21	The design temperature should be defined as the value of the highest temperature that would be generated by the design basis accident with the most severe mass and energy release, calculated with conservatism. The design temperature should also be consistent with the temperature that would be generated by design extension conditions, including those with core melting.	DEC, especially severe accident, should also be taken into account. Consistency with §4.35 and tables 1 and 2.			X	See previous remark
30.	4.22	All values of pressure and temperature used in the load combinations for the design of the containment should be determined with adequate margins to avoid cliff edge effects…	Clarification			X	Clear with the tittle
31.	4.33	For a containment design with double walls, the pressurization of the space between the two ~~containment~~ walls caused by a high energy piping break should be considered, unless such a break is precluded by the design.	Consistency with the definition of containment.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
32.	Table 1	Loads due to extreme external events: it should be added "*design extension hazard (DEH)*" in Load column and "*For example : commercial aircraft crash, extreme earthquake…*" in remarks columns	Those topics were discussed during the working group meetings. The group agreed on this addition, which constitutes a an improvement for the overload of the reactor.			X	Those topics were discussed indeed, but decision to consider DEH loads are design loads was not made. According to the IAEA Standards, the resistance of the containment as other items necessary to avoid large releases in case of extreme natural hazards can also be proved by an assessment of the margins No consensus reached at the CS
33.	4.40	To provide margins, the loads resulting from an SL-2 earthquake and design basis accidents should be combined using an adequate statistical combination of the loads, even though one cannot realistically be a consequence of the other since the pressure boundary of the reactor coolant system ~~is~~ should be designed to withstand seismic loads caused by SL-2 (see NS-G-1.6 [13]).	Consistency as NS-G-1.6 gives recommendations.			X	Accepted by English native speakers

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
34.	Table 2	Load combinations and engineering criteria: it should be added a column for “DEH”. The DEH load have to be combined with dead loads, live loads, prestressing, sustained loads and operating loads. The criteria associated to DEH: Acceptance criteria for steel containment: – structural integrity: level II – leaktightness: level II – Acceptance criteria for the prestressed concrete wall for: – structural integrity: II – leaktightness: N/A – Acceptance criteria for a liner on prestressed concrete wall : N/A	Those topics were discussed during the working group meetings. The group agreed on this addition.			X	See above DEH loads are not systematically included in the design specifications by MS No consensus reached at the CS
35.	4.46	To the extent possible, a failure should not be catastrophic (i.e. lead to early or large radioactive release to the environment) and should not cause additional damage to systems and components for retaining radioactive material.	Clarification			X	Better to be vague

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
36.	4.48 4.49	4.48. Consideration should be given to the need for the internal structures to withstand the loads* associated with accident conditions, and so to withstand the dynamic loads that are caused by high energy discharges or pipe breaks (e.g. water flowing from the discharge line of the safety valves and the relief valves into the suppression pool, the swelling of the pool water, the oscillation of condensate water, chugging and any other relevant hydraulic phenomena). 4.49. *In the case of design extension conditions with core melting, the loads on the structures inside the containment depend on the strategy to cope with the molten core that is adopted in the specific design.	4.49 is not a recommendation. Transform 4.49 as a footnote to 4.48			X	Yes it is not but any paragraph has to be numbered
37.	4.50	The acceptance criteria for leaktightness and integrity given in Table 2 should be met in the event of design extension conditions with core melting, and conditions for a containment boundary or basemat melt-through should be practically eliminated (see para. 3.69 3.68) for either of the design strategies for retention of the molten core (i.e. in-vessel retention or ex-vessel retention)	Editorial: the relevant reference article is 3.68 (3.69 is related to probability of occurrence)	X			
38.	4.64	These collapsing panels or louvres should be designed to open quickly in the event of energy released at a predetermined pressure so as to achieve fast equalization of the pressures in the various compartments and to utilize the full free volume of within the containment envelope.	Consistency with the wording used at the beginning of §4.64			X	Accepted by the technical editor

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
39.	4.70	For a spray system designed to operate in a recirculation mode, the spray nozzles should be designed to prevent clogging by the largest postulated pieces of debris that can reach them ~~through the intake screens~~ considering the features of the spray system and water collection systems aimed at filtering debris.	Clarification		X …prevent clogging by the pieces of debris that can reach them through the intake screens and filters.		
40.	Title before 4.87	*~~Passive~~ containment heat removal systems using passive features*	The definition of a "passive system" is not so clear	X			
41.	4.87	For containment with a steel shell, heat released in the containment under accident conditions can be removed passively through the steel shell~~.~~ if A secondary external envelope that is designed to remove heat by providing a natural circulation path for air (the chimney effect) is available ~~also necessary~~.	Simplification				Ignored
42.	4.89	• The necessary natural circulation within the containment and also that to the outside heat sink should be ensured for all relevant plant states for which such passive transfer is necessary and for any environmental conditions (atmosphere temperature, humidity,…) identified in the site evaluation;	To stress that environmental conditions may hinder the efficiency of cooling	X			
43.	4.104 to 4.110 4.128 4.218		"secondary confinement" should probably be in quotation marks as the IAEA safety glossary defines "confinement" as a function and not a means…	X			

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
44.	4.109	To maximize the efficiency of the secondary confinement, a filtered ventilation system should be provided and designed to maintain a negative gauge pressure in ~~design basis~~ accident~~s~~ conditions.	DEC conditions should also be taken into account		X …For design extension conditions, if a negative gauge pressure cannot be achieved and maintained in the confinement volume…		
45.	4.111	Containment bypass events arise when primary coolant and any accompanying fission products escape to the outside atmosphere without being processed~~ by containment systems for the control of radioactive material~~.	Simplification §4.113 to §4.117 give more detail on potential reasons for a containment bypass. Some examples (SG tube rupture) is obviously one example not covered by the last words of §4.111.	X			
46.	4.113	Any piping outside the containment that circulates highly contaminated liquids or gases should be designed to be leaktight under design basis accidents and design extension conditions, including with core melting. Loads and process conditions should be properly considered and combined.	DBA and DEC without core melt should also be mentioned.	X			

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
47.	4.114	Conditions for the opening of the containment (e.g. equipment hatch or fuel transfer tube) should be specified and adequate to prevent accidents with a release of activity to the atmosphere of the containment from arising, or else the ~~containment~~ opening should be capable of being quickly closed.	Consistency			X	"Close the containment" is also accepted
48.	4.120	Active systems for the reduction of the concentrations of airborne radioactive material should 4.120.be capable of being tested while they are in the standby mode in plant normal operation.	Clarification	X			
49.	4.125	Where ventilation systems are used for cleaning exhaust air to ~~mitigate the consequences of an~~ reduce on-site personnel and public exposure in accident conditions, filters should be designed and maintained so as to preclude any overloading of the filters with pollutants prior to their use in relation to an accident.	Clarification	X			

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
50.	4.132	Sources for potential release of combustible gases and the associated threats to the containment <u>and its associated</u> system<u>s</u> posed by such gases should be identified for the different plant states.	Associated systems should also be considered.		X and the associated threats to the containment and to systems necessary for the mitigation of the relevant accident conditions posed by such gases should be identified for the different plant states		
51.	4.135	The possible effects of the combustion of gases on the containment <u>and its associated</u> system<u>s</u> should be evaluated.	Associated systems should also be considered.		X Same		
52.	4.135	Such effects should be ~~prevented to the extent possible, or~~ limited, or <u>combustion regime should be</u> practically eliminated when it is not possible to mitigate these effects.	The sentence is not clear. The combustion can be prevented, not the effects if the combustion occurs. Consider the modification or deletion		or the conditions for combustion to occur should be practically eliminated when it is not possible to mitigate these effects		

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
53.	4.163	(b) Systems that can transport airborne radioactive material from the containment atmosphere to outside the containment in ~~design basis~~ accident~~s~~ conditions (e.g. systems used in some designs to mix the atmosphere inside the containment in order to prevent the ignition of hydrogen);	DEC should also be considered.	X			
54.	4.179	Equipment hatches are large openings in the containment ~~structure~~ that are normally closed.	Consistency	X			
55.	4.182	Consideration should be given to the design capacity of the concrete to cope with the loads 4.182.(pressure loads and thermal loads) and environmental conditions (heat, moisture and radiation) generated by ~~design basis~~ accident~~s~~ conditions.	DEC should also be considered.	X			
56.	4.192	Soft sealing materials are commonly ~~used in multiple containment applications~~ to ensure confinement, such as in the sealing of ventilation valves or the inflatable sealing of air locks.	Consistency with IAEA safety glossary		X used in multiple confinement applications		
57.	4.218	For the secondary ~~containment~~ confinement, or for a ~~primary~~ containment with double walls, monitoring of the pressure inside the secondary containment or in the annulus[13] should be established…	Consistency within DS482		X For the secondary confinement building, or for a containment with double walls, monitoring of the pressure inside the secondary confinement building		

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
58.	Footnote in 4.218	[13] "Annulus" indicates the free volume between the two walls of the containment~~ and the wall ensuring the shielding of the containment~~.	Consistency with 4.218	X			
59.	4.221	• The amount of condensate in the air coolers of the containment ~~building~~.	Consistency	X			
60.	4.228	The measurement and analysis of audio signals from the containment ~~building~~ for the detection of abnormalities…	Consistency	X			
61.	4.231	Appropriate instrumentation should be used to monitor the availability of the ~~containment~~ systems used for energy release and management from the containment, for management of combustible gases and for the control of radioactive material within the containment.	Clarification and consistency		X		

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
62.	4.235	In addition to conditions that require a complete and effective management of the energy, gases and radioactive material released inside the containment, there are other events for which only the individual isolation of the affected lines* is necessary, i.e. to limit the release of radioactive material from the containment to the environment. ~~This is the case for a break occurring outside of the containment of a pipe crossing the containment and carrying radioactive material, or for the failure of an interface between two associated systems (e.g. rupture of a heat exchanger tube of the component cooling water system) that leads to a release of radioactive material from a system inside the containment to a system outside.~~ The actuation conditions of the isolation devices should be derived from the values of appropriate parameters… *This is the case for a break occurring outside of the containment of a pipe crossing the containment and carrying radioactive material, or for the failure of an interface between two associated systems (e.g. rupture of a heat exchanger tube of the component cooling water system) that leads to a release of radioactive material from a system inside the containment to a system outside.	Create a footnote to focus 4.235 on a recommendation.	X			

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
63.	4.236		Should the supplementary control room also be mentioned in the paragraph before the bullet list?				No, the supplementary control room is not designed to operate the reactor in accident conditions
64.	4.236	(e) Information for assessing in a timely manner the radiological consequences and for assisting in decisions on long term actions for the protection of the public (off-site emergency measures). Instrumentation for assessing radiological consequences could include the following. -Dose rate monitoring instruments and detectors of airborne activity in the containment and in peripheral buildings; - Sensors for monitoring conditions in the containment sump water (e.g. temperature and pH); - Radioactivity monitors for noble gases, radioiodine and aerosols in the stack(s) and in the containment venting line; - Position indicators of valves for containment venting (if venting is foreseen in the SAMGs).	Clarification and consistency with §4.236 (f)			X	If a venting system is implemented, information about the status of the isolation valves is necessary (at least for a complete status of the position of the containment isolation valves)

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
65.	5.3	Inspections should be performed at different stages of the construction of the containment and its associated systems to ensure the conformity to design and construction specifications. Deficiencies, deviations from standards and non-conformances should be tracked and reported. Typical examples of structures, systems and components that should be subject to inspections performed during containment construction are as follows:	Associated systems should also be considered. To be consistent with the bullet list		X …different stages of the construction to ensure…		
66.	5.5	Commissioning tests for the containment and its associated systems should be carried out prior to the first criticality of the reactor to demonstrate the containment structural integrity, to determine the leak rate of the containment envelope and to confirm the performances of systems and equipment.	Associated systems should also be considered.	X			
67.	5.8	The test should be conducted with the components of the containment and its associated systems in a state representative (to the extent practicable) of the conditions that would prevail under accident conditions, to demonstrate that the specified leak rate would not be exceeded under such conditions.	Associated systems should also be considered.		X With the components in a state …		
68.	5.24	The test pressure should be the same as in the commissioning test (see also paragraph 5.9) and as required by the applicable design codes. In the design, attention should be paid to the additional stresses imposed by the tests, and test pressures should be established to prevent the tests from causing excessive stresses to the containment.	To avoid an inconsistency with §5.9 as §5.9 allows two main options for test during commissioning…				Ignored

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
69.	5.31	The design should provide a capability for testing safety systems and ~~systems implemented to cope with~~ <u>safety features for</u> design extension conditions <u>credited for the protection of containment</u> at intervals that reflect their importance to safety. The design should also provide a capability for other testing for otherwise demonstrating the necessary reliability for the <u>systems associated to the</u> containment ~~systems~~ individually or as a whole.	Consistency with IAEA Safety Glossary. Clarification to focus the recommendation on the scope of DS482.			X	This para. Is removed: repetition of 5.21
70.	A.2	This implies that the capability of existing plants to accommodate accident conditions not considered in their original design basis should be systematically assessed with the ~~further~~ objective to improve the current level of safety and, in particular, the overall efficiency of the containment and its associated systems.	Superfluous.				Ignored
71.	A.7	The assessment should aim at justifying with a reasonable level of confidence that the relevant equipment would be available <u>in due time</u> to perform the expected function.	Clarification, especially to cover non-permanent equipment specificities (time needed to bring at the required location and set-up the equipment) Consistency with A.10			X	A7 is for equipment included in the existing design
72.	A.11	Although the use of permanent equipment for avoiding large radioactive releases should be preferred (as for new plants) a more flexible approach with regard to the use of non-permanent equipment may be acceptable provided the plant is provided with adequate connection features <u>and sufficient time is available to set-up the equipment</u>.	To insist on time constraints in deciding whether the use of non-permanent equipment is acceptable.			X	This is the sense of A10

COMMENTS BY REVIEWER Country/Organization: FRANCE Date: October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
73.	A.12	Hazards not yet evaluated in the design basis that could have an impact on the containment and its associated systems should be considered and their effects should be evaluated. The design of the containment and its associated systems for accident conditions beyond the original design basis conditions should be assessed	Consistency	X			
74.	A.15	(f) With regard to intentional releases (e.g. containment venting) in the event of a severe accident, consideration should be given to providing filtration, including with high efficiency filters, prior to discharge to the environment.	The emphasis should be on filtration so that the release to the environment is minimized.			X	The recommendation, as it is phrased, looks like correct
/							

COMMENTS BY REVIEWER Reviewer: Civil & Site Studies Group, CNS Page.... of.... Country/Organization: Pakistan Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	2.14/ Page 5	In accordance with Requirement 17 of SSR-2/1 (Rev. 1) [1], the containment or a shielding structure is required to be designed to protect items important to safety housed inside the containment against the effects of natural and human induced external hazards identified by the hazard evaluation for the site, and against the effects of internal hazards originating from **structures, systems and components** ~~equipment~~ installed at the site. Causation and the likelihood of hazard combination should be considered.	The term structures, systems and components may be also used here instead of only equipments in line with the document.			X	In your proposal system should not be appropriate, so to be generic "equipment" is correct
1.	2.6(d)/ Page 4	~~(d) In addition, the containment and its associated systems are designed so that any radioactive release is as low as reasonably achievable, is below the authorized limits on discharges in operational states, and is below acceptable limits in accident conditions (see Requirement 55 of~~	This may be deleted. This requirement 55 of SSR-2/1 is already mentioned above at para 2.4. No need to repeat at para 2.6 again.			X	You are right but here in order to present the whole approach we cannot ignore bullet d)

COMMENTS BY REVIEWER Reviewer: Civil & Site Studies Group, CNS Page.... of.... Country/Organization: Pakistan Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		~~SSR-2/1 (Rev. 1) [1]).~~					
2.	2.7/ Page 4	The leaktightness of the containment is essential to confine radioactive material and to minimize radioactive releases. Leaktightness is generally characterized by specified maximum leak rates (overall leak rate and specific leak rates for containment penetrations, hatches, **personnel air locks,** and containment isolation valves)	Personnel and emergency air locks function to limit release of radioactive materials and are also tested for leak rate and need to be included along with other penetrations.	X			
3.	3.9/ Page 8	Paragraphs 3.10–3.12 provide recommendations on meeting Requirement 17 of SSR-2/1 (Rev. 1) [1] in relation to internal hazards. More detailed recommendations are provided in Protection against Internal Hazards in the Design of Nuclear Power Plants, IAEA Safety Standards Series No. ~~NS-G-1.7~~ [11]. **DS 494**	DS 494 is Revision and merge of NS-G-1.7 and NS-G-1.11. The same may be referred in line with practice of mentioning other standards as in preparation.			X	IAEA practice is to refer to the former guide for a revision and to DSxxx when it is a new document
4.	3.14. / Page 9	Guidance on typical external hazards, and their combination as appropriate, that usually need to be considered is	Please update. NS-G-1.5: External Events Excluding Earthquakes in the		(A revision of this publication is in	X	See above

COMMENTS BY REVIEWER Reviewer: Civil & Site Studies Group, CNS Page.... of.... Country/Organization: Pakistan Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		provided in ~~NS-G 1.5~~ **DS498** [12] and Seismic Design and Qualification for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-1.6 [13]. The list of external hazards contained in ~~NS-G 1.6~~ **DS490** [13] should be adapted or supplemented as necessary to include the site specific hazards.	Design of Nuclear Power Plants (2003), under revision byDS498 NS-G-1.6: Seismic Design and Qualification for Nuclear Power Plants (2003), under revision by DS490;		preparation.)		
5.	5.5~5.6 (between)/ Page 65	**Initial** Structural integrity test (ISIT)	During commissioning, the integrity test is named as initial integrity test.			X	Structural integrity test in NS-G 1.10
6.	5.29/ Page 68	Where it is technically feasible, the design should provide **accessibilit**y for a complete visual inspection of containment structures (including the tendons for prestressed concrete containments), penetrations and isolation devices.	Accessibility of personnel conducting periodic inspections for condition monitoring/visual inspection during containment pressure testing should be considered in design.			X	Fine for the technical editor
7.	5.30/ Page 68	Visual inspection of the containment envelope, including appurtenances and penetrations, should be made in conjunction with each of the tests specified in paras 5.24–5.25 A visual inspection technique that is specifically qualified for detecting the	The cracks are observed through visual inspection at pre mapped critical locations before, during and after maximum pressure integrity test of containment.			X	This is a new recommendation. MS approved without this addition.

COMMENTS BY REVIEWER Reviewer: Civil & Site Studies Group, CNS Page.... of.... Country/Organization: Pakistan Date:				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		type and size of cracks and/or other defects that are determined to be important for leakage and structural integrity should be employed. **The crack pattern mapping should be performed at atmospheric pressure and during maximum test pressure at the specified critical locations for concrete containment.**					

COMMENTS BY REVIEWER Reviewer: Ali Tehrani and Les Smith Page 1 of 4 Country/Organization: UK/Office for Nuclear Regulation Date:28 October 2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	4.16	New paragraph after 4.16. "Consideration should be given during design to the inclusion of appropriate installed structural monitoring instrumentation in the containment structure in order to assess ageing mechanisms predicted at the design stage and to help to identify unanticipated behaviour of the plant or degradation that might occur in service.	Requirement 31 of SSR-2/1 (Rev. 1) paragraph 5.52		X ….for the identification of unanticipated degradation or containment behaviour,…		To fully reflect req. 5.52 Better to include it in 4.17
2	4.209 Lines 3-5	(Originator to clarify intent of last sentence – see Reason)	"Concrete singularities" has no meaning in English. Assuming this is a translation from French it could be "anomalies", "variations", "discontinuities" or "defects" dependent on context.	X	"discontinuities"		
3	5.24 Line 6	Replace last sentence with "A tendon monitoring programme or instrumentation (such as installed strain gauges) can be used to	This would augment rather than replace containment structural integrity pressure & leak			X	To reflect the Korean practice I was requested to add this last sentence to

		measure ageing effects in prestressed concrete containments and to confirm that the level of prestress exceeds the minimum required to maintain structural integrity. Such monitoring can contribute useful information to the assessment of the structural condition of the containment between pressure tests but will not provide leakage information".	tests.				indicate that the structural tests to be performed periodically during the plant lifetime can be replaced by the implementation of a tendon monitoring programme for a pre stressed concrete containment equipped with unbounded tendons
4	Footnote Para 1.8	Consider replacing with "The phrase 'plant design envelope' is used to refer, in a simplified way, to all conditions considered in the design and development of a nuclear power plant.	This adds clarity.			X	"plant design envelope" makes sense for design only
5	Para 2.5	Consider replacing with: For operational states, the annual dose received by people living in the vicinity of a nuclear installation is expected to be comparable to naturally occurring background levels. For public exposure, the range of values for the dose constraint recommended by GSR Part 3 [6] represents an increase of up to max 1 mSv in a year, over the dose received from exposure due to naturally occurring radiation sources.	An increase of up to 1 mSv over the dose received in a year from exposure due to naturally occurring radiation sources is the maximum recommended by ICRP.	X			
6	2.12	Consider replacing with:	Adds clarity			X	'reasonably foreseeable

		The structural integrity of the civil structures of the containment and of the systems necessary for the mitigation of reasonably foreseeable accident conditions is expected to include appropriate margins with due consideration to combinations of loads originating from the hazards, or prevailing in the plant states during which they are required to operate (see Requirement 42 of SSR-2/1 (Rev. 1)					accident conditions” is not an appropriate phrasing in an IAEA Standard. “Accident conditions” is the correct one and is defined in SSr-2/1 rev1. Not authorized to change a “shall” requirement in an expectation
7	3.8	Consider replacing with: The design of the containment and its associated systems should consider the relevant postulated initiating events such as the following:	Adds clarity			X	No real difference and the proposed text was reviewed by Technical editors
8	3.11 C	Consider replacing with: …….. remains valid when considering the effects of the hazard;	Adds clarity	X			
9	3.38 2nd bullet	Consider replacing with: Loss of the measures designed to limit the containment pressure in the event of a design basis accident;	Adds clarity		X		‘Control” is replaced by “limit”. “measures” is rejected because here we refer to the loss components or systems only.

10	3.42	Consider replacing with: …. prevent over pressurisation of the containment …				X	A slight over pressurization is not an issue with regard to the integrity of the containment (the structure is required to be designed with margins to avoid a cliff edge effect
	General	Authors need to consider replacing “energy” to “mass and energy” as both of these aspects, in fault conditions, influence the containment design.		X			
	General	Authors need to consider replacing “as far as is practicable” to “as far as reasonably practicable”, where appropriate; e.g Para 3.54.				X	Even if the use of this phrasing is not fully consistent in the IAEA Safety Standards, in SSR-2/1 rev.1 where independence is addressed “as far as is practicable” is used. I can understand that it could be discussed but it was my primary reason to use it here. “Reasonably” is only used when SSR-2/1 is quoted, except one time in A$ but it applies to existing NPP and therefore not surprising.
11	4.6	“conneing ” to be corrected		X			
12	4.11	This para need to be updated – The operators should be able to operate those actions required to be Tech Specs/EOPs.				X	By design, no action should be required within the grace period. In addition some measures should be

							included in the design to prevent erroneous operator actions implemented too quickly.
13	*Section: Systems operating in a recirculation mode in accident conditions* Paras: 482 to 486	The Authors need to give consideration to including: The filter debris by-pass should NOT adversely impact containment spray performance in accident conditions; The sump filter design is expected to consider residual debris within the containment, and concrete debris transported to the sump from potential LOCA jet impact.				X	See 4.70 (for the clogging of the spray) Even if the primary cause is the steam jet in case of a LOCA, it is better to have a recommendation independent of the cause
14	4.98	Consider replacing “limit” with “minimize”.		X			
15	4.113	Additional clarity is needed to focus the discussions on DEC-B, rather than just design extension conditions.	Clarity is needed to align core melt with DEC-B.			X	DEC-B is not used in the IAEA Standards. When a recommendation applies to “DEC-B” it is always indicated “accident conditions with core melting”
16	4.115	Compliance with this para. Would be rather challenging. Authors should consider the relevance of the guidance.				X	The last sentence gives flexibility This recommendation was technically approved by other NUSSC members.

COMMENTS BY REVIEWER Reviewer: ENISS Page 1 of 2 Country/Organization: ENISS Date: 03/11/2017				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	2.10	2.10. The structural integrity of the civil structures of the containment and of the systems necessary for the management ~~mitigation~~ of accident conditions is required to be ensured with appropriate margins taking into account the loads or combinations of loads originating from the hazards, or prevailing in the plant states during which they are required to operate (see Requirement 42 of SSR-2/1 (Rev. 1) [1]).	The term “mitigation” is related to severe accident. Requirement 42 of SSR-2/1 (Rev.1) is related to safety analysis design of the plant design: the term “management” is more appropriate for these conditions.			X	2.10 deals with systems designed for any accident conditions
2	4.40	To provide margins, the loads resulting from an SL-2 earthquake and design basis accidents 4.40.should be combined using an adequate statistical combination of the loads [e.g. root of the sum of the squares (RSS)], even though one cannot realistically be a consequence of the other since the pressure boundary of the	This comment refers to a previous comment raised by ENISS and the resolution indeed appears in step 8a of the guide [See 4.37 “…should be combined using SSR method (Square Root of the Sum of the Squares)…”]. However, for some unknown reason the message disappeared in later revisions. We believe it is rational to provide an example of a suitable statistical method that can be applied to	X			It disappeared and be replaced by this new formulation to be more general on the request form Japan (20/12/2016 p 2/5)

		reactor coolant system is designed to withstand seismic loads caused by SL-2 (see NS-G-1.6 [13]).	manage the type of load-combination specified, as a way to help the designers and provide added piece of advice. The “square root of sum of squares”, sometimes abbreviated RSS, is the standard method used to combine uncorrelated loads.				
3	4.146	The number and positioning of recombiners or igniters should be justified ~~on the basis of adequately detailed analyses of the distribution of combustible gases~~ and shown to be adequate.	See previous comments and discussion with ENISS (May 2017) We believe 4.143 is too prescriptive for a guideline. It is also ambiguous in the sense that it states that “detailed” analyses should be performed without providing any explanation of what is meant by “detailed”. Proposal of ENISS Hence, it is suggested that the paragraph is revised accordingly “The number and positioning of recombiners or igniters should be justified and shown to be adequate.” 2017- 06-19 The resolution was not in table (sorry for that) but the clause 4.142 (in the latest revision) was simplified to consider your comment According to the last version, the comment has not been accounted for as indicated.			X	Your comment made on 16 May 2017 was considered and “on the basis of detailed combustible gas distribution analyses resulting from different scenarios of an accident with a core melting” was replaced by “on the basis of combustible gas distribution analyses adequately detailed” The Technical editor made a modification of the phrasing to improve the English text . Text is now “on the basis of adequately detailed analyses of the distribution of combustible gases” This latest modification did not change the technical meaning proposed in June 2017 approved by NUSSC. This text also addressed your remark primarily made to remove detailed analyses.