Table II

DS482 Resolution of comments of Canada, ENISS, France, Japan, USA

COMMENTS BY REVIEWER Reviewer: M. de Vos Country/Organization: **Canada**/Canada/Canadian Nuclear Safety Commission Date: May 23 2016				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	All	The writing style of guidance is inconsistent from the style used in other IAEA Safety Guides and needs to be corrected prior to the next review cycle. A number of sentences are written in the passive voice style without the use of SHOULD. Rewriting those sentences has potential to subtly change the technical intent of the sentence. A number of guidance statements are also written in very awkward language and should be revised for conciseness and clarity. Examples are provided in the comments below but insufficient time was available to propose new text for all problematic clauses.					Safety guides aim at providing recommendations and guidance to fulfill requirements. To justify completeness of the guide all requirements for the scope of the safety guide need to be addressed, even if some of them are quite generic and applicable to most of systems. Restricting recommendations to the more relevant and omitting those that are generic would be a mistake and could lead to believe that missing requirements were not relevant for the systems.
	3.10	~~Hereafter a list of typical external~~	Instead of providing an	X			Making reference to

1.		~~hazards, and their contribution as appropriate, usually considered is given for guidance but should be supplemented as needed to include the site specific hazards:~~ Also, delete table of External Hazards Replace the above with the following: Identification of external hazards to be considered in a design is described in IAEA NS-R-3 *Site Evaluation for Nuclear Installations* and supporting Safety Guides. This information can be used to establish bounding external events for a generic (i.e. non-site specific) facility.	incomplete list, the guide should point the reader to the IAEA publications that provide additional information on identification of external hazards. The identification of potential external hazards to be considered is outlined in IAEA NS-R-3 which can also be used for generic plant design envelopes. Requirement 17 in SSR2/1 actually provides a footnote that points to NS-R-3 so this is worth identifying in this document.				make to NS-R 3 Rev.1 is a good option for consistency.
2.	3.11	Please clarify the meaning of this sentence to something along the lines of: Containment structures and buildings housing systems required to mitigate accident conditions should be designed to withstand ~~the~~ loads ~~caused by the~~ imposed by external hazards. ~~and protected against the effects caused by the neighboring buildings.~~	Guidance statement is too vague. Neighboring buildings don't cause effects. In fact, events in neighbouring buildings are considered to be Internal Events and should not be discussed in this section.		X should be designed to withstand ~~the~~ loads imposed by external hazards. and protected against the effects imposed by neighboring buildings not designed to		All the buildings might not be designed to withstand seismic loads, and therefore such a recommendation makes sense.

					withstand SL 2 seismic loads.		
3.	3.13	Design methodologies should contain measures to confirm that adequate safety margins exist to eliminate or mitigate against external hazard cliff-edge effects.	Sentence is awkward as written. This is a design document but the guidance as written is telling the designer to modify methods, design and construction codes. In fact, what should occur is that the designer, using their design processes, evaluates a code, and factors in additional safety margins if necessary to address cliff edge effects. (i.e. "Code-Plus" approach)		X Design methodologies should contain measures to confirm that adequate margins exist to avoid that cliff edge effects in the event of a slight increase of the severity of the external hazards.		
4.	3.23	Please either expand on the meaning of 'adequately' or delete the word.	"should be adequately documented" implies acceptance criteria exists as to what is adequate. Where can these criteria be found?	X			"Adequately" will be deleted
5.	3.34	Dedicated design provisions to address DECs ~~should be implemented to prevent an early or a late containment failure in case of DEC. These provisions~~ should aim to prevent a significant over pressurization of the containment structure, to stabilize the molten core and to remove the heat from the containment.	Existing sentence implies that mid-event timeline containment failure is acceptable.		X to prevent a containment failure		\

6.	3.35	"~~Venting of the containment should not be the primary mean to control the pressure build up inside the containment~~." Venting of the containment should be the last resort means to control the pressure build up inside the containment"	The use of "should not" is inconsistent with IAEA writing style for guidance. Sentences must be written in "should " language.		X Different means to control the pressure build up in accident conditions inside the containment should be implemented, and venting (if any) should be used as the last resort mean.		
7.	3.36	"Venting the containment should not be needed in case of controlled DBAs" "Containment should be designed such that venting is not needed during DBAs.	The use of "should not" is inconsistent with IAEA writing style for guidance. Sentences must be written in "should " language. Also the term 'controlled DBA' is questionable. Is there such a thing as an uncontrolled DBA?		X Containment should be designed such that venting is not necessary during DBAs.		Has been moved see new 3.26
8.	3.51	~~The additional safety features should be preferably emergency power supplied by the alternate AC power source~~. Emergency power supplies to additional safety features should be supplied from diverse and reliable supplies.	Grammar issue. Needs rewording for clarity. The use of "preferably" is not appropriate in a guidance document as it does not convey a clear regulatory direction. Why is the guidance specifying AC power		X Additional safety features for such DECs should be supplied from a different and diverse power source (e.g. by the alternate power source installed at		To match the requirement

			when the principle is about power diversity from a reliable source.		the unit).		
9.	3.53	~~Independence between safety systems and specific safety features necessary to mitigate the consequences of an n accident with core melting should be implemented.~~ Safety systems and specific safety features necessary to mitigate the consequences of an accident with core melting should be independent.	Awkward sentence structure. Reworded for clarity but the question remains as to why this is quite generic guidance is only in a containment design document?	X			
10.	3.56	CCF = Common Cause Failure: Please spell this out in first use.		X			Abbreviations used in the text will be in the list of abbreviations
11.	3.58	This clause should be deleted.	Regarding: "A low probability number for an accident with core melting should not be a reason for not protecting the containment against the conditions generated by such an accident.": 1. It is not appropriate to write guidance statements with "Should Not" 2. The whole concept of "Practically eliminated" is based on a probabilistic discussion as risk can never be zero. Generally			X	Arguing a low probability is necessary but not sufficient. So it is of importance to keep that statement.

			discussions involve additional of preventive and mitigation measures until there is agreement that enough has been done. Part of the decision making by default involves a measure of low probability.				
12.	3.10 Safety Classification	Entire clause should be replaced by a reference to SSG30. No further guidance is necessary.	SSG 30 applies to all SSCs in a Nuclear Power Facility. Further guidance is not necessary in this document and in fact stating any additional guidance implies that SSG-30 is incomplete.			X	Clause 3.64 provides clear recommendations for the classification of the containment systems important to safety. Implementation of SSG-30 to systems at a NPP SSG-30 was not the scope of the Safety Guide.
13	3.71	Please clarify regulatory meaning o this clause: "Components that have been used for qualification testing should generally not be installed in the facility (???) ~~used for construction purposes~~ unless it can be shown that the conditions and methods of testing do not themselves lead to an unacceptable degradation of safety performance."	This clause if difficult to interpret because of the way it is written. Please clarify by reformatting into a SHOULD statement instead of a SHOULD NOT statement.		X		That is the exact clause 4.20 of the former revision. "for construction purposes can be deleted
14.	3.12 Codes and	Delete entire section (clauses 3.73 and 3.74)	1. The definition of "widely accepted" is not			X	Clauses 3.73 and 3.74 are copied from the

	Standards		clear. 2. The use of acceptable codes and standards does not need to be recommended in a guide… It is abundantly clear in Clause 4.15 of SSR 2/1.				former revision approved by the review Committees and CSS and then published in 2004. As that information is still correct I do not have justification to delete them.
15.	3.13	Delete entire section 3.75-3.78.	None of this section is specific to containment design but is generic to overall design and safety analysis. Use of PSA is clearly articulated in Requirement 10 of SSR 2/1.			X	Clauses 3.75 and 3.76 are typically relevant for the DS 482 and draw attention to areas where PSA should contribute to the justification of the correctness of the design
16.	4.11	What does this clause mean? “Means allowing interconnections between units should be installed to facilitate the management of accidents not considered in the design of the NPP.”	Please rewrite and clarify the intent of the guidance. An example of an interconnecting system would be useful.			X	e.g. Possibility to power supply an Unit in SBO condition from the neighboring unit as done at FKSH Dai ichi units 5 and 6
17.	4.1.5 Ageing	Delete section	This clause is generic to overall plant design which must consider ageing effects. This is covered by Requirement 30, clause 5.49 in SSR 2/1.			X	This text is copied from the former revision approved by the review Committees and CSS and then published in 2004. As that information is

							still correct I do not have justification to delete it.

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: ENISS			Page: 1 of 9				
Country/Organization: **ENISS**			Date: 2016-05-30				
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General comment	The writers of this text are PWR experts. The text must be checked and adapted by BWR containment experts in order for the Guide to be more generally applicable to LWR containments.					MS representatives with BWR reactor technologies have also reviewed this guide.
2	Para. 2.13	The composition and thickness of the concrete, the local radiological protection and the access management in given areas are such that the dose limits and dose constraints for operators…	The composition and the thickness of the concrete are not the key point to ensure the dose limits for operators and the public, on the contrary of the local radiological protection or the access restriction in given areas.			X	No need to modify (Materials and thickness of the concrete contribute to the attenuation of radiations.
3	Para. 3.3	The design ~~basis for~~ of the containment and its associated systems should take into account ~~include~~ any condition created by normal operation, anticipated operational occurrences, and accident conditions that are not practically eliminated (design basis accidents and design extension conditions). Load combinations created by internal and external hazards should also be included in the design ~~basis~~ of the structures, systems and components.	Remind that the load combinations have to be included depending on their probability of occurrence. The design basis includes conservatives approaches that provide margins for the given situations and load combination associated. Design extension conditions should not be included in the design basis because the rules may be less conservative than those applied to design basis conditions. cf 3.27. In RCC CW AFCEN distinguishes design basis situations from design extension situations, and considers design extension external hazards situations. The term design basis in this paragraph can create misunderstanding.			X	Accident conditions means postulated conditions according to SSR 2/1 Rev.1 Design extension conditions are considered to define the design basis of SSCs necessary to mitigate consequences of DECs (Req. 20, item 5.28) Design basis is defined in the IAEA glossary 2007 edition.

4	Para. 3.7, First bullet	Breaks in high energy systems located inside or outside the containment; for pipes inside the containment LBB could be applied;	LBB is commonly accepted and an important method to eliminate postulated pipe breaks in high energy systems.			X	LBB concept allows not to consider the dynamic effects of a high energy pipe break but not to ignore other effects
5	Para. 3.31 Second bullet	For PWRs the loss of the containment spray system controlling the pressure build up in the event of a design basis accident;	In BWRs pressure build up is controlled by the suppression pool.		X The loss of the means designed to control the ….		Spray systems also exist in many BWR
6	Para. 3.36	Move the paragraph to section 3.5.1	The chapter is dealing with DEC not DBA	X			
7	Para. 3.37 First bullet	Venting line should be equipped with filters of adequate efficacy ~~(e.g. HEPA filters);~~	Guides should not specify technologies. Also doubtful to the choice of filter. HEPA will probably not be able to handle the energy generated in the filter. The purpose of a filter in the vent line must be to prevent ground contamination and to trap the large part of the released radioactivity not to catch all.		X … with filters of high efficacy.		
8	Para. 3.44	Move this paragraph to 3.7.2	CCF is a DEC and should not be discussed under DBA			X	CCF between redundancies within a single safety system should be prevented to the extent possible and influence the design of the safety systems
9	Para. 3.53	Independence between safety systems and safety features necessary to mitigate the consequences of a core melt accident should be	In some cases independence and separation cannot be fully achieved.			X	Not disputed by any other reviewers

		implemented as far as is reasonably practicable.					
10	Para. 3.58	A low probability of occurrence of an accident with core melt is not a reason unless acceptable justification for not protecting the containment against the conditions generated by such accident is provided.	The case of the vessel rupture in operation is precluded because of its low probability of occurrence.			X	The issue here is a low calculated probability of postulated accident with core melt. If really still unclear the wording "postulated" could be added
11	Para. 4.3 10th bullet	In PWRs ensuring an adequate single free volume in the upper part of the containment to improve the efficiency of the containment spray (if any);	In small BWR containments the spray is used for temperature and pressure control and to wash out radioactivity.			X	Advanced BWR are now designed with large free volume and are very comparable to PWR free volumes.
12	Para. 4.3 13th bullet	In PWRs the lower part of the containment should be designed to facilitate the collection and identification of liquids leaked, and also the channeling of water to the internal water storage in the event of an accident.	The text is written for PWRs		X ..and also the channeling of water to the sumps…		The deleted sentence is a repetition of bullet 11
13	Para. 4.5	Delete the paragraph.	Not a safety requirement. It is industrial safety and overridden by national regulations.			X	Copy of text from previous revision approved by Review Committees and CC. No real justification to remove it.
14	Para. 4.15	~~The design pressure should not be lower than the value of the peak pressure that would be generated by the design basis accident with the most severe release of mass of material and energy and increased by 10 %.~~ The containment is designed for	We propose to adapt the design pressure notion due account of DBC and DEC accidents. The containment is designed with several loads combinations and some parts of the containment are sized by different load combinations, there is not a unique design case. Furthermore criteria depend on the codes.				Correct but there is a clear consensus to keep a definition for the design pressure. Clause 4.14 is of greater importance for design. Should be raised by

		different situations : Test DBC accident DEC accident Each situation is associated with a defined criterion that takes into account an associated required behavior. The designer should define the pressure of each accident situation providing sufficient margins to cover uncertainties. (for example 10%).	In France RCC CW code provides that design basis accident (P,T) is balanced only by the pre-stressed force with a criteria of no traction within the containment wall, thus it provides margin to deal with design extension conditions which are verified with different criteria. The reliability of the design depends on the design criteria as much as the design pressure. There is not a single (P;T) that sized the containment structure. The margin of 10% on the initial DBA pressure has to be taken at an early stage of the project to include potential uncertainties. Ok to define a margin of 10 % but not linked with a design pressure which defined the tests pressure. At the early stage of the project a margin of 10% should be taken to cover those uncertainties. At the end of the project it has to be verified that all the accident pressure are below the initial values. P DBC final > 1,1 P DBC initial and P DEC final > 1,1 P DEC initial (the margin could be less than 10 % at the end of the project between the initial pressure, and the actual maximum pressure (calculated at the end of the design phase). The test pressure should be defined with the actual maximum pressure due to the most penalizing pressure between design basis condition and design extension condition including eventually some uncertainties or phenomenon not properly represented during the test (liner thermal thrust). In France we define the test pressure relatively to the most penalizing pressure Max {Pdbc; PDecwo core melt} multiply by 10%, we need to modified AIEA NSG in order not to have a cumulative				the ENISS representative at the meeting

			coefficient 1,1(margin) x 1,1(non represented phenomenon) x DBA pressure, it would be too stringent.				
15	Table 3, p. 30	SL-2 plus DBA – Acceptance criteria for a liner on prestressed concrete wall ~~Level III~~ N/A	The level III has been removed in the 4.31 and 4.32 paragraph. Replace level III by N/A for liner under SL-2 + DBA	X			
16	Table 3, p. 30	SL-2 plus DBA – Criteria for leaktightness = ~~Level II~~ N/A	This combination is a conventional combination in order to provide margin from a resistance point of view at a time when there was a significant lack of information on the accident conditions and the seismic level was low. But nowadays the accident conditions taken into account, the increasing of seismic level, the increasing of concrete thickness due to APC and the PSA for internal accident and seismic conditions lead to explicit the margins provide by the design. We consider that this conventional combination leads to a non-homogeneous level of margins limited to the vertical lower part of the containment. This combination shall not be relied on the leaktightness verification because it provides no homogeneous margin and could lead to very complicated calculation without enhancing the safety.				For the time being will be kept as it is.
17	4.34	To provide margins, loads resulting from earthquake level SL2 and design basis accidents should be combined in a quadratic manner, although one cannot realistically be a consequence of the other since the pressure boundary is designed to withstand seismic loads caused by earthquake level SL 2. The designer may choose to provide margin by another mean taken into account a design extension earthquake	There are different manners to provide margins and we consider that the assessment of the ultimate capability or a design extension earthquake could be a better way to enhance the reliability of the design by reinforcing the weakest point of the containment under pressure, thermal or seismic loads.				See above

		for example or by enhanced the reliability of its design following the ultimate capability assessment see section 4.2.5.					
18	4.43	In this strategy, a part of the heat from the molten core is removed through the wall of the vessel…	A part of the energy could be removed by re-flooding the corium in the vessel			X	Yes may be, but for design the ex vessel cooling system is designed for removing the whole decay heat
19	Para. 4.53	The free volume of the space within the containment envelope or the ratio between primary and secondary gas phase is the primary physical parameter determining peak pressures after postulated pipe rupture events. It can thus be used as an inherently safe and reliable design feature.	The statement is not valid for BWRs.			X	Text in red not understood. A large free volume is always a good design and such recommendation also applies to BWR.
20	Para. 4.55	The energy management function of the spray system is to remove energy from the containment atmosphere in order to limit both the maximum values and the time durations of the high pressure inside the containment in accident conditions. For BWRs it is long-term temperature control inside the containment.	In a BWR with a suppression pool energy control is handled by the suppression pool cooling			X	Containment spray where installed has that function
21	Para. 4.56	Containment spray systems should be designed so that a major fraction of the free volume of the containment envelope into which the steam may escape in an accident can be sprayed with water. For a BWR the free volume of the containment is the primary compartment.	Adjust the text to suit BWRs		X Containment spray systems should be designed so that a major fraction of the free volume of the Primary containment into which the steam may escape in an accident can be		No need to add the last sentence

					sprayed with water		
22	Para. 4.58	The initial source of water for the containment spray system after a pipe rupture is usually a large storage tank or for a BWR the suppression pool.	Adjust the text to suit BWRs		Or the suppression pool		Suppression pool is also a large water storage tank.
23	Para. 4.59	…In the same way, the spray pumps should be protected from cavitation or failure due to debris which can exist in the sumps and may cross the sump filters, for BWRs suppression pool. …	Adjust the text to suit BWRs		X …the spray pumps should be protected from cavitation or failure due to accumulation of debris. ~~which can exist in the sumps and may cross the sump filters~~		
24	Para. 4.61	…In the containments of some designs the suppression pools are also used to collect the steam discharged from the safety valves or the relief valves, or to provide water for recirculation in the emergency core cooling, decay heat removal and containment spray systems…	Adjust the text to suit BWRs	X			
25	Para. 4.74	An intermediate and closed cooling system should be provided for heat transport to the ultimate heat sink. ~~This cooling system should be equipped with features to detect activity and isolate leaks within the recirculation loop.~~	Leaks will be detected by an increase or decrease of volume in the expansion vessel. There is no distinct motive for having a dedicated system for activity measurement. Activity measurement of the intermediate loop will complicate the plant without providing a clear safety benefit.			X	Activity detection system is recommended in the intermediate cooling system
26	Headline 4.5.2.5	4.5.2.5 Plants with steel shell containment cooling systems	The writing is dedicated to AP 1000. The text should be written so that the principle could be used in other designs with active or passive secondary cooling side			X	4.75 and 4.76 give examples of 2 different design options
27	Para. 4.75	For containment with a steel shell, heat released in the containment under accident	Changes to make the writing more general.	X	Secondary containment has been replaced by		

		conditions can be removed actively or passively through the containment walls. ~~The secondary containment is designed to remove the heat by providing a natural circulation path for air (the chimney effect) and means for spraying of the outside of the steel shell.~~	The envelope outside the containment is not a "secondary containment" as defined in another part of this guide (see section 4.6.3). According to section 4.6.3 a "secondary containment" is a structure designed to collect leaks from the primary containment.		secondary and outside envelope		
28	Additional bullet to para. 4.77	The possibility for freezing outside conditions should be considered for normal as well as accident conditions.	Ambient temperatures below 0ºC may complicate passive designs and therefore should be given adequate consideration.	X			
29	Para. 4.117	Noble gases cannot be filtered out, but consideration should be given to the use of systems to delay their release until further radioactive decay has occurred. The release of noble gases should be balanced against the risk of keeping a large amount of hydrogen inside the containment and the consequences of it leaking into the secondary containment.	Hydrogen is highly explosive and very hard to trap inside a large and complicated structure like a containment.		4.117 will be deleted		For new NPPs, the risk of H2 detonation should be very low and therefore the venting could be delayed. When maintaining the structural containment integrity is an urgent need, venting will get the priority
30	Para. 4.158	Concrete should have characteristics of quality and performance (strength, density porosity) consistent with its use. The quality of the concrete used for containment structures should be correspondingly high, consistent with the safety function of the containment. Design considerations will depend on the containment concept. For concrete containments with stressed cables leak tightness could be ensured with or without a liner,	Most pre-stressed containments also have a liner.				

		whereas a reinforced concrete containment structure usually ensures only strength while its steel liner ensures leak-tightness.					
31	Para. 4.200 4th bullet	For PWR small sub cooling margin in the reactor coolant system,	PWR specific	X			
32	4.203	A monitoring or sampling system should be provided inside the containment to enable assessment of the risks of explosion from combustible gases. The design of the system should take into account the following factors: • Possible sources of combustible gases such as interaction between clad material and water, or interaction between molten core and concrete, radiolysis; • Presence or not of oxygen and inert gases; • Presence of devices aimed at	It appears to be very cautious with this measure due to the important number of sampling needed and the associated risk to jeopardize the confinement by containment bypass for a rather limited gain.			X	I agree and am not convince whether keeping the possibility to transport gases outside the containment during severe accident conditions is a good recommendation. I do not have clear ideas on the current practice. So we keep it as it is , recommendation However recommendation 4.208 should be appropriate for your comment

		recombining hydrogen as produced, and type of these devices (passive or active) • Sufficient mixing or not of the containment atmosphere to avoid local possibilities of hydrogen accumulation. • No impact on confinement by potential containment by pass.					

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer:			Page.... of....				
Country/Organization:		**FRANCE** / IRSN	Date: May 2016				
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	3.7.2./3.49	Complementary safety features should have an adequate reliability to contribute to the practical elimination of situations which might lead to early or large releases ~~of early and large releases.~~	The "practical elimination" approach should be related to accidental situations and not to releases (consistency with SSR-2/1 §2.11, 4.3, 5.31 and INSAG 10 §5.1). Substitution of "early and large" with "early or large" to be coherent with the rest of the text		X Complementary safety features should have an adequate reliability to contribute to the practical elimination of situations that could lead to an early radioactive release or a large radioactive release.		
2	3.9	Title: practical elimination of situations which might lead to early or large releases	See comment 1		X PRACTICAL ELIMINATION OF SITUATIONS THAT COULD LEAD TO AN EARLY RADIOACTIVE RELEASE OR TO A LARGE RADIOACTIVE RELEASE		
3	3.9/3.57	Regarding the scope of this Safety Guide, such possibilities should include: • Conditions involving high	For situations which could damage the containment in a late phase (in yellow) it should generally be	X			With the foot note

		energetic phenomena the consequences of which could not be mitigated with implementation of reasonable technical means, • Core melt accident combined with a containment bypass. Typical examples of conditions to be practically eliminated: • Severe accident conditions that could damage the containment in an early phase as a result of a direct containment heating, steam explosion or hydrogen detonation; • ~~Severe accident conditions that could damage the containment in a late phase as a result of a basemat melt-through;~~ • Severe accident conditions with an open containment, notably in shutdown modes; • Severe accident conditions with unintentional containment bypass.	possible, in particular for new reactors, to mitigate their consequences "with implementation of reasonable technical means" according to the first bullet of 3.57. Moreover, they do not involve specific "high energetic phenomena". It is proposed to delete the second example or to add a footnote underlining this aspect. This FN could be: "These conditions should be analysed during the identification of situations to practically eliminate. Nevertheless, their "consequences could generally be mitigated with implementation of reasonable technical means."				

COMMENTS BY REVIEWER Reviewer: Japan NUSSC Member Page 1 of 23 Country/Organization **Japan**/NRA Date: 30 May. 2016				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
1.	1.5/ L2 & L5	Modify as follows; … comprehensive safety assessments ~~are to~~ should be carried out considering these recommendations in order to identify safety improvements Reasonably practicable or achievable safety improvements ~~are to~~ should be implemented in a timely manner [17].	These practices would be recommended practice.			X	This recommendation is from the Vienna Declaration and cannot be reflected with "would".
2.	2.10	Modify as follows; As ~~a supplementary~~ measures to those implemented to mitigate the consequences of the postulated conditions, the use of non-permanent equipment is considered.	To keep consistency with Req.58 of SSR-2/1 (Rev. 1).		X Additionally to measures implemented to …		
3.	3.6. / the last senten ce	•Fuel handling accidents in the containment, including the reactor building in BWR.	As for BWR, it should be added the reactor building which equipped spent fuel pool.		X		
4.	3.8. /3rd bullet	• A single hazard should not have the potential for a common cause failure between safety systems designed to control design basis accidents and ~~the dedicated systems or~~ safety features for ~~required in the event of accident~~ design extension conditions with core melting.	Be consisted with SSR-2/1 (Rev. 1).	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
5.	3.10	Hereafter a list of typical external hazards, and their contribution as appropriate, usually considered is given for guidance but should be supplemented or deleted as needed ~~to include~~ depending on the site specific ~~hazards~~ characteristics.	Some of the hazards are not necessary considered in some site, depending on the site characteristics.				Examples will be removed and replaced by a reference to Safety Standard NS-R 3
6.	3.10. /table	Human ~~origin~~ induced hazards	Be consisted with SSR-2/1 (Rev. 1).				Table 3 will be removed (Canada comment)
7.	3.13./ L1	Delete "construction code used" 3.13. Methods~~,~~ and design ~~and construction codes used~~ should provide adequate margins to justify that cliff edge effects would not occur in the event of a slight increase of the severity of the external hazards (see Requirements 9 and 11).	The margin of the construction code should be discussed in "3.13 CODES AND STANDARDS", based on the scientific evidence and engineering judgement.			X	The use of well proven industry codes contributes to margins
8.	3.16. /2nd bullet	~~•Systems necessary to contain the molten core;~~	This is not required in SSR-2/1 (Rev. 1).			X	Whatever the strategy implemented for retention of the

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							molten core (vessel or core cátcher), that equipement should be included in the list
9.	3.16. /L1	Structures, systems and components (SSCs) ultimately necessary ……	Although this abbreviation is included in P65, it is desirable to show full spelling if it appears first.	X			
10.	3.16. / last para./l 2	… at an elevation higher than ~~the beyond~~ considered in the design ~~basis flood~~ or adequate engineered safety features (such as water tight doors etc.) …	Be consisted with SSR-2/1 (Rev. 1).		X …than the one derived from the site hazard evaluation		
11.	3.17.	Margins provided by the design of the containment structure should be ~~large enough~~ adequate so that ~~it can be demonstrated that~~ its integrity is preserved in case of natural hazards exceeding those resulting from the site hazard evaluation.	Be consisted with SSR-2/1 (Rev. 1). Superfluous as important message is to preserve the integrity.	X			
12.	3.18.	Margins provided by the design of the associated systems ultimately necessary to avoid early or large radiological release should be ~~large enough~~ adequate	Be consisted with SSR-2/1 (Rev. 1).	X			

COMMENTS BY REVIEWER Reviewer: Japan NUSSC Member Page 1 of 23 Country/Organization **Japan**/NRA Date: 30 May. 2016				RESOLUTION			
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		so that ~~it can be demonstrated that~~ the integrity and operability of those systems would be preserved in case of natural hazards causing loads exceeding those resulting from the site hazard evaluation.					
13.	3.25/ L2	For the performances of the containment structures and systems, design basis accident ~~conditions~~ should be calculated…	Terminology.			X	Conditions imposed by design basis accidents
14.	3.28.	DECs relevant for the design of the containment structure and the systems should be identified on the basis of engineering judgement as well as deterministic ~~and probabilistic~~ assessment complemented by probablistic assessemant.	Clarify relationship of both methodology.		DECs relevant for the design of the containment structure and systems should be identified taking use of deterministic approach, probabilistic analyses and engineering judgement.		
15.	3.36.	~~Venting~~ The ~~the~~ containment venting system should not be needed in case of controlled DBAs.	Completeness.		Different means to control the pressure build up in accident conditions inside the containment		

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
					should be implemented, and venting (if any) should be used as the last resort mean.		
16.	3.37. /2nd bullet	Containment venting system should be designed and located to withstand loads from external hazards.	Completeness.			X	Included in recommendations given by para. 3.4 (for external hazards). No need to target more specifically venting equipment in that recommendation
17.	3.41./ L1	The following factors should be considered to achieve the adequate reliability of the systems necessary to control energy, radioactive material and combustible gases released inside the containment:	Clarification	X			
18.	3.44. /L3	Clarify "the extent practical". Vulnerabilities for common cause failures between the redundancies of the safety systems should be identified, and design or layout provisions be implemented to make	Clarification.		…be implemented to remove the more likely to achieve a high reliability required for safety sytems.		

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		the redundancies independent to the extent practical.					
19.	**3.7.2**	Safety features for design extension conditions without significant fuel degradation.	Editorial.	X			
20.	**3.7.2 & 3.7.3**	Combine subsection 3.7.2. and 3.7.3.	Safety features for DEC without significant fuel degradation and Safety features implemented to mitigate the consequences of DEC with core melting are identical in many cases, and then no need to be described separately.			X	Safety features are different because ones are to prevent accident from escalating to a core melting accident and others are designed to mitigate the consequences of a core melting accident
21.	3.48.	~~Needs for additional systems or safety features are reactor technology and design dependent.~~	No meaningful.			X	Should be kept for understanding.
22.	3.55.	Different systems should be implemented for the energy management (for pressure control and for temperature control including containment heat removal ~~from~~	Be consisted with SSR-2/1 (Rev. 1) requirement 58.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
		~~the containment~~) in the different plant states.					
23.	3.56./ 3rd bullet/ L3	Independence implemented between systems should not be compromised by vulnerabilities for CCF in I&C systems necessary for the safety actuation ~~of the~~ systems or the monitoring of the containment conditions (see ~~paragraph~~ subsection 4.10 for more recommendations for I&C systems ~~and Instrumentation~~).	Use the words stated in the safety glossary. Editorial for referring to the subsection、not para. Editorial.	X			
24.	3.56. 2nd bullet /L4	In particular, safety features for design extension conditions ~~designed to mitigate consequences of accidents with core melting~~ should be independent from equipment designed to mitigate conditions inside the containment caused by design basis accident.	Clarification.			X	This recommendation primarily applies to safety features designed to mitigate consequences of an accident with core melting
25.	3.57./ 3rd to 6th bullets	• ~~Severe accident conditions~~ Design extension conditions with core melt that could damage the containment in an early phase as a result of a direct containment heating, steam explosion or large hydrogen explosion ~~detonation~~;	"Severe accident conditions" should be replaced to "design extension conditions with core melt". Be consisted with SSR-2/1 (Rev.			X	Situations to be practically eliminated are not designed extension conditions

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			1). As noted in DS491, local steam explosion cannot be eliminated. Hydrogen detonation may not be identified as an only cause destructive explosion in the Fukushima Daiichi NPP accidents.				
26.	3.57./ the last bullet	Clarify "Severe accident conditions with unintentional containment bypass".	Clarification.				Venting is an intentional confinement by pass type
27.	3.62.	Move the examples to footnote; with the highest standards defined by the industry[3] for nuclear application[4]- footnote 3; (e.g. ASME Section III, Division 1, subsection NB [5], RCC-M1 code [6], JSME NSC1[*] or similar standards) footnote~~3~~4 ; Except parts of the RCPB whose failure would result in leakage that is compensable by the normal water make-up system.	Practice or code in individual member states should be referred in footnote. Also, JSME code should be indicated.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
28.	3.63. Last line and related reference	(e.g. ASME Section III, Division 1, subsection NB [5], RCC-M1 code [6] , JSME SNC1 [**] or similar standards). REFERENCES: [**]Japan Society of Mechanical Engineers, Codes for Nuclear Power Generation Facilities - Rules on Design and Construction for Nuclear Power Plants.	Adding Japanese example.	X			
29.	3.74.	• Quality assurance; • Materials; • Structural Design (Pressure Vessel and Piping etc.) • Manufacturing (e.g. welding); • Civil structures; • ~~Pressure vessels and pipes;~~ • Instrumentation and control; • Environmental and seismic qualification; • Pre-service and in-service inspection and testing; • ~~Quality assurance;~~ • Fire protection.	Changing order since QA is the first priority in many codes/standards -unification of the category		X Bullet for manufacturing also deleted		
30.	**4.1.2**/ 2nd sentance	The requirement of ~~Recommendations~~ [18] to prevent non authorized persons …. in an integrated manner with the ~~recommendation~~ requirements for safety.	To keep consistency with method to describe the requirement of Safety Standards publication			X	[18] gives recommendations and requirements

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			and Security Standards publication.				
31.	4.4/ L5-6	If the doses due to such exposures exceed the applicable dose limits ~~and dose constraints~~, additional shielding.	Dose constraints are not valid during and after an accident.	X			
32.	4.6/ L3	The ability to ensure that radiation doses to operators remain within the acceptable dose ~~limits~~ constraints will determine.	The workers should be protected within dose constraints in operational states.	X			
33.	4.8.	At least ~~two~~ one emergency escape routes from the containment should be provided. In addition, security provisions for controlling access to the containment should be considered.	Para. 5.65 in SSR-2/1 (Rev. 1) requires at least one.	X			
34.	**Subsection 4.1.4.** Paras. 4.10. & 4.11.	It is not preferable to describe requirements in Ref[2] with "should" statement. Suggested to describe how these requirements are implemented in the design of containments and its associated systems. Otherwise, delete 4.1.4., including para. 4.10 and 4.11.	"shall statement" in Ref[2] is replaced with "should statement" in these two paragraphs. There are no specific practices here.				

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35.	4.12. /L4	All ageing mechanisms should be identified and taken into account in the design. Provision should be made for monitoring the ageing effects of the containment, for testing and inspection of components where possible, and for periodically replacing items whose safety characteristics are susceptible to age-related degradation.	Clarify the objective of the monitoring		Monitoring will be replaced by controlling		
36.	4.12. /L7 reference	More detailed guidance is provided in [7] and [**]. REFECENCES: [**]International Atomic Energy Agency, Safety Reports SeriesNo.82, AGEING MANAGEMENT FORNUCLEAR POWER PLANTS:INTERNATIONAL GENERIC AGEING LESSONS LEARNED (IGALL)	It is desireble to add IGALL report as reference because the document covers aging management programs.			X	Preference to put in reference IAEA Safety Standards which re documents reviewed by the Review Committes and CSS
37.	4.27.	For containment design with ~~double walls~~, secondary containment structure, the pressurization of the annulus space ~~between the two containment walls~~ caused by a high energy piping break should be considered.	Prevention of confusion. The term “double wall containments” used in current NS-G-1.10 is replaced with the term “secondary containment” in the most of the paragraphs of this draft document.			X	Annulus is a narrow volume surrounding the Primary containment which exist where a doublé Wall containment is constructed

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38.	Title of Table 2.	~~MINIMUM~~ TYPICAL SET OF LOADS ON THE CONTAINMENT TO BE CONSIDERED AT THE DESIGN STAGE	Some of items of "load" are not necessary for some type of containment, as loads considered are design dependent technically.	X			
39.	4.30.	… Design margins should be provided by either or both: …	Either or both methods should be used.	X			
40.	4.30. 1st bullet	• Use of the design factor approach (i.e. ~~L~~limiting stresses and deformations to some fraction of the ultimate limit for that material)	Unification of the description to the next bullet.			X	Clearer if with 2 bullets.
41.	4.34.	Clarify the detail of "quadratic manner" to combine the loads. Should be used SRSS (Square Root of the Sum of the Squires".	Unclear manner is proposed "SRSS".	X	Square Root of the Sum of the Squares		
42.	4.34. /L1	To provide margins, loads resulting from earthquake level SL-2 and design basis accidents should be combined in a quadratic manner, if the probability of the coincidence of the events is reasonable, although one cannot realistically ...	The probability that SL-2 and DBA occur simultaneously should be considered to judge if its combination should be evaluated..			X	Practice in some MS to provide margins taking into account that RCS is already designed to withstand SL-2 seismic loads
43.	4.31 & 4.32	Level III should be defined as TABLE 3 includes "III" in the line of "Engineering criteria for a liner on pre-	Missing definition.				Level III was kept by mistake and is now deleted

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
		stressed concrete wall".					
44.	4.45.	In this strategy, the containment should be equipped with a structure (e.g. core catcher, wet cavity) ~~dedicated~~ to contain and cool the molten core outside of the vessel.	"Core catcher" is one of the options and "wet cavity" is another option.	X			
45.	4.46 – 4.49	Replace "core catcher" with "ex-vessel retention structure" as follows:	Ditto.	X			
46.	4.49	The ~~core catcher~~ ex-vessel retention structure should be considered as items ultimately necessary to avoid large releases and consequently it should be such that design margins are adequate to deal with seismic loads ~~exceeding~~ by SL-2.	Ditto for replacement of "core catcher". To avoid double count for margin; design margin is one margin, meanwhile "loads exceeding SL-2" include another margin.		Exceeding SL2 is correct		
47.	4.51.	During normal plant operation, a ventilation system should be operated to maintain the pressure~~,~~ and temperature ~~and humidity~~ in the containment within the limits specified for normal operation. More detailed recommendations are given in [9]. the pressure and, temperature and humidity	Typically, 'humidity' is not controlled.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
48.	4.55.	The energy management function of the spray system is to remove energy from the containment atmosphere in order to limit both the maximum values and the time durations of the high pressure and high temperature inside the containment in accident conditions.	Clarification Description that 'temperature' be also included			X	Primary function of spray is to stop and limit the pressure build up inside the containment. Then enrfgy is removed from the containment by the Containmement heat removal system.
49.	4.71.	To avoid the clogging of sump screens or strainer filters, special care should be taken in the design of piping, component insulation and the intake sump screens or strainer filters themselves, and consideration should be given to the chemical effects as determined by the sump and suppression pool water chemistry and temperature, and to corrosion/erosion of some metallic components and their interaction with the debris. In addition the material used inside the containment (thermal insulation material, paints, etc.) should be carefully considered. The design should also avoid certain combination of these materials which may worsen the clogging issue in sump screen or strainer filter.	Clarification Description that can be applied also to BWR.	X			
50.	4.72	Special consideration should be also given to the effects of debris by-passing the sump screen or strainer filters on the potential for blockage of flow channels in fuel assemblies.	Clarification Description that can be applied also to BWR plant.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
51.	4.96.	Add after para. 4.96. as followings; "Preventive measures for hydrogen deflagration and explosion in the secondary containment including reactor building for BWR."	Clarification.				HVAC is supposed to opérate to collect and reléase all leaks and gases. Do I have to understand that is not appropriate or effective enough for hydrogen leaks?
52.	4.127.	The effective ~~efficiency~~ ~~of the~~ systems should be such that global and local hydrogen concentrations are low enough to preclude fast deflagration or ~~detonation~~ explosion.	Better wording.			X	Efficiency includes effectivness/ efficacy and time
53.	4.129.	Add the following sentence to the last sentence or somewhere. Negative impact of spraying caused by condensation should be also considered.	Condensation inducing hydrogen risk in PWR (w/o inertization) should be addressed here or elsewhere.	X			
54.	4.166. /L1	In the selection of metallic materials, the following considerations should be taken into account considering the ageing mechanisms: • Thermal and mechanical loads including seismic load; • Chemical interactions, including those with chemicals used in containment spray	Add the description to take into account the ageing. Cralification of the description.		SS light modification. New bullet: Senitivity of materials to ageing effects		This text is text from former revisión already approved.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
		systems; • Resistance to brittle fracture; • Resistance to corrosion against all environments in contact to the containment.					
55.	**4.9.4** 4.170. 4.176.	**4.9.4. Covering, cushioning, thermal insulation and coating materials** 4.170. Covering, cushioning, thermal insulation and coatings materials should not compromise any safety functions in the event of their deterioration. 4.176. Ageing mechanisms that affect covering, cushioning, thermal insulation and coating materials should be assessed and appropriate replacement intervals should be established.	Add the word to cover every auxiliary materials.	X			
56.	4.171.	To minimize the production of debris that can accumulate on containment floors and clog the sump screen or strainer filter or damage recirculation pumps.	Clarification Description that can be applied also to BWR plant.	X			
57.	4.172.	The amount of ~~insulation~~ debris generated in the event of high energy pipe breaks.	Generalization Description that can be applied to all debris.	X			

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
58.	4.10.2.2./ 2nd bullet	For ~~double wall~~ the containment system with secondary containment, monitoring of the pressure in the annulus space between ~~the two walls~~ primary containment and secondary containment should be established to check whether the pressure is within the range specified for the normal operation (a small negative pressure should be maintained in the annulus).	See comment No.37.		X		
59.	4.188.	Humidity is a highly significant factor for the detection of leaks from a ~~water~~ reactor cooling system. Different techniques can be used to measure the humidity in operational states and DBA) such as:	Clarification. The plant situation in which this parameter is to be expected needs to be clarified.			X	This measurement is needed to detect leaks as early as posible and therefore are requested in operational states
60.	4.191.	Airborne and water (drain storages and sumps) activity measurements should be implemented as ~~redundant and~~ a diverse mean for complementary detection of leaks.	Clarification. The measurement of airborne and water activity is not redundancy. Diversity seems to be appropriate.	X			
61.	4.201. /L2	…there are other events for which only the individual isolation of the affected lines is necessary to limit the release of radioactive material from the containment to the environment to be anticipated during the	Clarification. The plant situation in which this parameter is to be expected needs to be clarified.			X	You are right, some piping might be isolated form RCS as a preventive

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
		normal operation…					measure, but here the recommendation apply to line or leaks which would result in a reléase outside the continment if not isolated if they occurred.
62.	4.202.	For the management of accidents, appropriate instrumentation displays and records should be available in the MCR and the emergency response facilities on the site to allow personnel to make a diagnosis and to decide and to take the manual protection actions specified in the Emergency Operating Procedures or ~~on~~ in the Severe Accident Management Guideline. Such instrumentation should provide information about:	Completeness. Not only the MCR but also the emergency response facilities on the site are important function for the management of EOP to SAMG. Editorial.		Emergency Control Center		Not to confuse with emergency facilities needed for the implementation of protective actions in case of nuclear emergency
63.	5.8.	Add the description on reference vessel method for leak rate test Another way of determining leak rate is the reference vessel method, which determines leak rate from the pressure differential between the containment atmosphere and the refer ence vessel atmosphere.					Should be clarified before inclusión in the Safety Standard

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
64.	5.10.	For ~~double wall~~ the containment~~s~~ sytem with secondary containment, one way to determine the direct leak rate .	See comment No.37.				Doest this method apply for all types of Secondary Containment
65.	APPENDIX A.3 /L2	..... ~~Mobile~~ non-permanent equipment	Be consisted with SSR-2/1 (Rev. 1).	X			
66.	APPENDIX 7, 8	Are the non-permanent equipment on the site available for preventing early radioactive releases? To add "Non-permanent equipment could be useful in case of external hazards, and should be diversely stored."	Clarification for the use of non-permanent equipment taking into account the lessons learnt from the Tepco Fukushima Dai-ichi NPPs accidents.				Will depend on the discussion at the NUSSC meeting
67.	APPENDIX 9, 10 and 14.	A.9 3rd bullet: ~~beyond original design basis conditions~~ design extension conditions A.10 5th bullet: ~~beyond design basis plant states~~ design extension conditions A.14 1st bullet: ~~beyond design events~~ design extension conditions	There wording look confusing. Should be used "design extension conditions" here consisted with SSR-2/1 (Rev. 1).		X		A 9, A 10 and A 14,: "…beyond original design basis …"

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
68.	APPENDIX A.10	~~Management~~ of ~~e~~Energy Management: Add new bullet as follows; - Venting piping and stack should neither be shared nor interconnection from other units at the multi-unit site. - Make it easier to open manually rupture desk for immediate vent operation.	The title should be consisted with the main body. Should be added the lessons learnt from the Tepco Fukushima Dai-ichi NPPs accidents.	X			
69.	APPENDIX A.11	~~Management~~ Control of radionuclides:	The title should be consisted with the main body.	X			
70.	APPENDIX A.13	Instrumentation and Control Systems: Clarify the 3rd bullet of "the new instrumentation".	The title should be consisted with the main body. Clarification.			X	Tittle for paragraph 4.10 has been changed and is now "Instrumentation" . Recommendations are for instrumentation and monitoring but not for I&C systems.
71.	APPENDIX A.14	~~Mobile~~ Non-permanent equipment:	Be consisted with the main body.	X			

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Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Item 2.3	For accident with core melting, the releases are minimized such that only off-site protective actions limited in terms of areas and times are necessary (see Requirement 20 item ~~5.31~~ 5.31A),	Wrong item number	X			
2	3.26	Design basis ~~extension~~ conditions should ~~be identified and~~ used to establish the design extension conditions ~~bases~~ of containment structure and of systems ~~necessary to meet the radiation protection objectives established for that category of accidents~~.	In order to determine design extension conditions (a term that is not used in the US, but could be equated with beyond design basis conditions) it would seem logical to first establish the design basis.			X	Clarification of the 3.26 recommendation: Design bases of components necessary to meet the radiological objectives for core DEC conditions should indicate what DEC conditions are expected inside the containment. Recommendation 3.26 is correct but may be not correctly phrased.
3	3.27	This paragraph needs to be rewritten.	It is illogical that the design bases of the containment structure and systems would be less conservative than the assumptions for	X	Calculation performed to calculate conditions created by		I full agree with your statement. Recommendations 4.15 and 4.16 should also be considered although practically

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			design basis accidents.		DEC ~~the design bases of the containment structure and systems~~ may be less conservative than those used for design basis accidents provided		the containment structures are not designed taking on the basis of P and T design parameters, but are designed taking into account all the load combinations (Table 3)with their respective stress limits. In conclusion in order to avoid misleading interpretation see my proposed change
4	3.28/3.29	The basis for definition of DECs is unclear.	If DECs relevant for the design of the containment structure and the systems are to be identified on the basis of engineering judgement as well as deterministic and probabilistic assessment, it would seem that the three examples in 3.29 may not result in required action.			X	e.g. Probability of occurrence for small LOCA with the total failure of High head ECCS might not be low enough to be ignore in the design envelope.
5	3.37	It should be possible to reliably open and close the vent line~~s~~ valves.		X			

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6	4.1.3	In the event of an accident, ~~there should be no need for any action to be taken by the operator within a certain grace period. For necessary manual intervention,~~ the operator should have adequate information available as well as sufficient time to diagnose and assess the conditions in the plant before taking any manual action.		X			
7	Item 4.44	The structures of the cavity should be considered as items ultimately necessary to avoid ~~large~~ releases and consequently they should be such that design margins are adequate to deal with seismic loads exceeding SL-2.	The design should not allow uncontrolled releases.			X	Larger margins are here expected in the structural design of the reactor cavity which plays an essential role for in vessel retention strategy. It means that reactor cavity should be able to withstand seismic loads higher than those cause by SL2 earthquake (SSE).
8	Item 4.66	The use of the water inventory in the pressure suppression pool system for other functions should not impair the performance of its main function of providing a means of controlling the pressure in the	Editorial	X			

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Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		dry well in case of accident condition.					
9	Item 4.88	To limit the number of leak paths, the number of penetrations should be optimized as indicated by the recommendation ~~4.11~~ 4.1.1.	Wrong item number		X		Recommendation 4.3
10	4.116	Where containment venting systems are installed, the system ~~discharge~~ should be ~~filtered~~ designed to control the release of radionuclides to the environment [15]. The system design could include ~~Typical~~ a filtering system~~s~~ ~~include~~ such as sand, multi-venturi scrubbers ~~systems~~, HEPA or charcoal filters, or a combination of these. Filtering systems ~~HEPA, sand or charcoal filters~~ may not be necessary if the discharge ~~air~~ is scrubbed in a water pool.		X			More detailed but acceptable for me
11	Appendix 1	Recommend that a reference to the Appendix be added somewhere in the standard so it is understood how the appendix is to be used with the standard. Perhaps in paragraph 1.5 of the DS.	Clarify the use of Appendix 1 in DS482. The new revision has a proposed four page Appendix I which proposes assessment of existing plants against new design extension conditions to “improve the current level of	X			As the appendix was sent separately, there was no reference to the appendix in the body text.

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Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			safety". There is no reference to this appendix in the DS482 itself.				
12	Appendix 1 Paragraph A.9	• All internal and external hazards that are addressed in the design basis should be ~~periodically~~ re-evaluated as required on the basis of up to date methodologies meteorological and geological data	These evaluations should be performed as required, such as when new data becomes available vs. a time-based frequency.		X		All internal and external hazards that are addressed in the design basis should be ~~periodically~~ re-evaluated on the basis of up to date methodologies meteorological and geological data
13	Appendix 1 Paragraph A.10	Recommend this bullet be struck or changed to read: • ~~Specific safety~~ Design features and systems should be ~~implemented~~ evaluated as required to ensure the cooling and stabilization of the molten core. Direct contact of core debris and containment structural concrete should be reliably prevented.	The addition of beyond design basis safety features to existing reactors should be performed only after a cost-benefit analysis that justifies the cost of the back-fitting of such features to the reduction of risk.		X		• ~~Specific safety~~ Design features and systems should be ~~implemented~~ evaluated to ensure the cooling and stabilization of the molten core. Direct contact of

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Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
							core debris and containment structural concrete should be reliably prevented.
14	Appendix 1 Paragraph A.11	• ~~Intentional release (e.g. containment venting) in the event of a severe accident should consider filtration through filters of high efficiency prior to being discharged to the environment.~~	The addition of beyond design basis safety features to existing reactors should be performed only after a cost-benefit analysis that justifies the cost of the back-fitting of such features to the reduction of risk.			X	Intentional releases in the event of a core melting accident should be filtered (reasonably feasible+ effective to minimize the radiological consequences)
15	Appendix 1 Paragraph A.13	• The containment shall be equipped with measuring and monitoring instrumentation that provides sufficient information on the progress of core melt accidents and threats to containment integrity	Such instrumentation need not be independent from the safety-related instrumentation, provided it can withstand severe accident conditions.			X	"To the extent possible" seems to be reasonable. Survivability is necessary but is not the single issue. Some of them are expected to be supplied by different electrical bus bars,

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		and by which the operator can do the necessary SAMG actions. ~~That instrumentation should be to the extent possible independent from the instrumentation used for the mitigation of DBAs~~;					set of batteries.