Comments Resolution: DS433 Safety Aspects in Siting for Nuclear installations, date 2011-05-02

COMMENTS BY REVIEWER Reviewer: M-L Järvinen , K. Valtonen Page.... of.... Country/Organization: STUK Date: 2011-06-16				RESOLUTION Date: 2011-08-15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	The new safety guide should take into account the lessons learned from the Fukushima accident.				x	We carefully reviewed the document against lessons learned from Fukushima accident (ministerial conference and Fact Finding Mission Report). Also we had consultations with the key experts (on this subject) that participated to the Facts Finding Mission to Fukushima. All lessons learned so far on this subject deal with detailed hazards characterization. Please note that all site safety related aspects SHALL BE addressed and confirmed during site evaluation process which is outside the scope of this SG and is covered in NS-R-3 + other 6 safety guides. It should be stressed that site selection is a de-regulated activity. Considered all above we believe that lessons learned are included in this SG by providing guidelines how to consider safety aspects early in the site survey and site selection process.
2	General	The safety guide should take into account the requirements for the NPPs; the new requirements				x	Based on careful review and consultation with the responsible safety officer for NS-R-1 review we

		document NS-R-1 just approved in the CSS.					concluded that the new requirements from NS-R-1 have no impact to site survey and site selection process.
3	General	The siting requirements document NS-R-3 should be updated due to the approval of the new NS-R-1.				x	The new NS-R-1 has nothing that invalidates the actual NS-R-3. Revision of NS-R-3 will be initiated in 2012 as planned and revision process will take 3-4 years.
4	General	The philosophy of the NS-R-1 should be built in the safety guide. Thus the plant conditions and the practically elimination concept.				x	The new requirements of NS-R-1 have no impact to to site survey and site selection process.
5	General	The consequential event aspects should be brought into the guide.				x	We do not see any issue related to consequential event aspect for this Safety Guide. This is explicitly addressed in Site Evaluation Stage: Out of Scope of this SG.
6	General	The events influencing several units on the same site should be considered.				x	It is a Site Evaluation issue – out of scope of this SG.
7	General	The continuity planning should be taken into account.				x	It is considering in Site Evaluation Stage.
8	General	The classification of the criteria into three groups should be expanded to four groups: safety related, sabotage, continuity planning and NS.				x	There are other IAEA publications dealing with Sabotage/Security aspects. Continuity planning aspects are included in safety related criteria consistent with other IAEA publications.
9	General	The dependences of the infrastructure of the society should be considered.				x	There is an NE publication in preparation dealing with Infrastructure and socio-economic aspects.

The table illustrating the affect of the external event or events on the NPP

	Reactor design and operation					Continuity planning	
	Event frequencies and the plant conditions						
	Normal operation	**Anticipated operational occurrence**	**DBA**	**DEC**	**Practically eliminated concept**	**Reactor safety**	**Emergency planning**
Frequency / Event		$f > 10^{-2}$/ a	$10^{-3} < f < 10^{-2}$	several cat. of low frequencies, $f < 10^{-5}$/a - exceptional			
Eathquake						the affect on the supply of ….etc.	affect on the transfer of people
Tsunami							
Geotechnical							
Volcanism							
Flooding							
Extreme Meteo Events							
Human Induced Events							
Sabotage							
Dispersion							
Feasibility of the emergency plan							
Non-Safety							
Consequential event: earthquake and tsunami							
Consequential event: high wind speed and							

Data from the statistics or analysis

loss of infra							

Comments Resolution: DS433 (2011-04-19)

COMMENTS BY REVIEWER	RESOLUTION
Reviewer: S. Maki Page 1 of Country/Organization: Japan/ NISA Date: 7 June 2011	Date August 15, 2011

Editorial comments

Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
1	Footer on Cover Page	Revise "DS433Draft 00.06-2011-01-27". (Same for the following footers.)	Inconsistent with the revision number/date shown at the top of the document.	x			
2	TOC Chapter 3	Add "SITING PROCESS", "SITING CRITERIA", and "SITING OF NEW NUCLEAR INSTALLATIONS IN EXISTING SITE".	Section titles are missing in the TOC.	x			Done!
3	TOC ANNEX I	Add "ANNEX I".	Title is missing.	x			Done!
4	TOC ANNEX II	Annex II → ANNEX II	Editorial correction	x			
5	1.1/3-4	Recommend adding the document number "NS-R-3" after "Site Evaluation for Nuclear Installations" as in Item 1.6.	Clarification	x			
6	1.2/4	the prevention of accidents and it's mitigation is the way → the prevention of accidents and its mitigation are the ways	Grammatical correction	x			

7	1.3/3	outcome of this task of may affect → outcome of this task may affect	Grammatical correction	x			
8	1.4/5	"complex designed safety measures" ➔"complexly designed safety measures" Or ➔"designed safety measures"	Editorial correction	x			
9	1.7/1-2	Recommend adding "Site Survey for Nuclear Power Plants, 50-SG-S9, 1984" to the REFERENCE list.	Completeness	x			
10	1.7/2 (Relating Annex-Ⅱ.14, Ⅱ.25)	Description of the word "Member States（MS）".	MS is used in Annex as abbreviation of "Member States". It will be better to describe where it appears first.	x			
11	1.11/2	the importance of safety aspects become → becomes	Grammatical correction	x			
12	2.3/1	consistsof → consists of	Editorial correction	x			
13	2.3/2	regionsare → regions are	Editorial correction	x			
14	2.3 Fig.1	Trough → through		x			

15	2.3/1	The siting process for a nuclear installation consistsof→consists of	Editorial correction	x			
16	2.3/2	In site survey stage, large regionsare→regions are	Editorial correction	x			
17	2.5/8	regulatory authority and which → regulatory authority which	Editorial correction		x All the site related activities, involving confirmatory and monitoring work, are taken up in the pre-operational stage after the approval of the SER by the regulatory, authority		
18	2.5/13	periodic safety review → Periodic Safety Review	Editorial correction	x			
19	Figure 2	Assessment →Site assessment	Consistency with Figure 1	x			
20	Figure 3	REGINAL CRITERIA → REGIONAL CRITERIA RESONABLE NUMBER OF → REASONABLE NUMBER OF REJECTED CANDITATE SITES → REJECTED CANDIDATE SITES	Editorial correction	x			

21	3.3 (2)/2	the unfavorable site → the unfavorable sites	Editorial correction	x			
22	3.3 (3)/1	the third step twofold → the third step is twofold	Editorial correction	x			
23	3.3 after (3)/1	the third one in the second stage → the third one into the second stage	Editorial correction	x			
24	3.4/4	This allows the selection of alternative sites in the event the first selected site encounters → This allows the selection of alternative sites in the event <u>that</u> the first selected site encounters	Grammatical correction	x			
25	3.5/3	from the all the stake holder → from all the stake holders	Editorial correction	x			
26	3.7/6	all possible potential site → all possible potential sites	Editorial correction	x			
27	3.8/1	two type of → two types of	Editorial correction	x			
28	3.8 first dot/1	Use a larger font size for “the” in “the exclusion criteria”.	Editorial correction	x			
29	3.8 first dot/2, 3	phenomena or hazard → phenomena or hazards engineering solution are → engineering solutions are	Editorial correction	x			
30	3.10/2	Annexure I → Annex I	Editorial correction	x			
31	3.12/1	The exclusion criteria → Exclusion criteria	Correction	x			

32	3.13/2	related not only to weakness related to site conditions but also the feasibility of engineering solutions → related not only to weakness related to site conditions but also <u>to</u> the feasibility of engineering solutions	Grammatical correction	x			
33	3.15/2	It is generally considered good practice → It is generally considered <u>to be</u> good practice	Correction		x It is generally advantageous if candidate sites are dispersed to two or more regions with different attributes.		To accommodate other comment
34	3.22/1-2	at the preferred site(s) or several preferred sites→ at the preferred site or several preferred sites	Editorial correction	x			
35	4.1/5	exclusion, or discretionary → exclusionary or discretionary	Editorial correction	x			
36	4.2/2	IAEA NS-R-3 [2] → IAEA NS-R-3 [1]	Editorial correction	x			
37	4.4.(d)	Coastal flooding (due to wave action, storm surges, <u>seiches</u>, tsunamis, …)	?			x	What is the comment?
38	5.1/3	other institution → other institutions	Editorial correction	x			
39	5.14/1	sufficiently robust that → sufficiently robust so that	Editorial correction	x			

40	6.1/1	provides → this section provides	Editorial correction		x The graded approach as mentioned in Para. 1.14 provides guidance……..		To accommodate other comment
41	6.9/7	Recommend using "ranking criteria" instead of "preference criteria" if they have the same meaning.	Editorial correction		x		"Preference" was deleted.
42	Appendix-A18/2	….of nuclear installations these should be….. →….of nuclear installations. These should be….	Editorial correction	x			
43	ANNEX I Table I-1	√ → ✓	Editorial correction	x			
44	ANNEX II	Annex II → ANNEX II	Editorial correction	x			
45	ANNEX II.5.1.iv)/2	….. including projections for the lifetime of the nuclear power plant → nuclear facility	Consistency with the scope of this guide	x			
46	ANNEX II II.22/1	Table II-2 → Table II-1	Editorial correction	x			
47	Annex II.24 to 25	The paragraph number is confused and there are repetitions.		x			
48	ANNEX III.3/4	consideration is taken in to account → consideration is taken into account	Editorial correction	x			
49	ANNEX III III-5/1	III-5 → III.5	Editorial correction	x			

50	ANNEX III III-5	Recommend revising the paragraph numbers “10 –14” to “1 – 4”.	Editorial correction	x			
51	ANNEX III III-5 10/1	a reference side → a reference site	Editorial correction	x			

Comments resolution: DS433 Safety Aspects in Siting for Nuclear Installations Draft 00.08 2011-05-02

COMMENTS BY REVIEWER Reviewer: F. Féron Page Country/Organization: France /ASN Date: 31 May 2011				RESOLUTION Date 2011-08-15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	1.3	Even, outcome of this task ~~of~~ may affect seriously the final success of the program	Typo	x			
2.	1.3	~~Poor planning and execution, lack of information and knowledge on applicable international safety standards and recognized practices could lead to faulty decision making~~ and major delays either at the construction or at the operational stages of a nuclear installation. Faulty decisions in the site selection stage might also require major resource commitments at a much later phase of the project	Superfluous. The question is not on the origin of the poor decision making but on its consequences. The end of the paragraph is enough.			x	Without first part, intent of the paragraph is not clear.
3.	13	~~Poor planning and execution, lack of information and knowledge on applicable international safety standards and recognized practices could lead to faulty decision making and major delays either at the construction or at the operational stages of a nuclear installation~~. Faulty decisions in the site selection stage might induce major delays either at the construction or at the operational stages also require major resource commitments at a much later phase of the project	Rewording to take into account previous comment			x	Same as that of Sl. No. 2
4.	1.3	Re-evaluation and upgrades would be required for plants during operation, with ~~costly~~ eventually extended shutdown periods.	Alternative wording not insisting explicitly on costs.	x			
5.	1.12	the process that eventually terminates with the selection of site(s) for one or more ~~units of a~~ nuclear installations.	Simpler alternative wording	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron Country/Organization: France /ASN			Page Date: 31 May 2011	Date 2011-08-15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
6.	1.14 footnote 1	For sites at which nuclear installations of different types are collocated, particular consideration should be given to the use of a graded approach so ~~that the mitigation features of the most severe radiological consequences of the complete set of installations is addressed~~ that siting evaluation is commensurate to the most hazardous nuclear installation.	If several nuclear installations, with various degree of hazards, are to be located at a same site, then, the most hazardous installations should be used to select the site.	x			
7.	2.3	consists_ f ….. large regions_are	Typo	x			
8.	2.5/7	Delete "All the site related… operational stage."	Superfluous			x	Required for clarity
9.	2.5/	Replace "With the approval of the Final safety analysis report (FSAR) of the nuclear installation" by "As the Final safety analysis report (FSAR) of the nuclear installation becomes applicable"	There is no formal approval of FSAR in France even if it is reviewed by the regulator in the licensing process.			x	Original paragraph is more generic in nature.
10.	Fig 2	Add "FSAR update" to "PSR report"	FSAR is a living document			x	Site characteristics are revisited during Periodic Safety Review (e.g. every 10 years) and reported in PSR report.
11.	2.6/2	And <u>be</u> consistent with IAEA"		x			
12.	2.7 (b)	The <u>definition</u> ~~approval~~ of the site related design basis parameters	To avoid confusion on who approves, if any	x			
13.	2.7 (c)	The <u>review</u> ~~approval~~ of the PSAR or preliminary safety case	To avoid confusion on who approves, if any (see previous comment on §2.5)	x			

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14.	3.1	the surrounding demographic setting and dispersion characteristics should ease ~~enhance~~ the implementation of mitigation provisions in case of ~~capabilities against the~~ radiological release.	Mitigation is nearly always possible, it may however be extremely difficult and resources intensive.		x Further, the surrounding demographic setting and dispersion characteristics should be conducive to the implementation of mitigation measures in case radiological release.		
15.	3.3 (3)	(i) to evaluate the site in order to assure there are no features at the sites that would preclude the construction and operation of a nuclear installation ~~NPP~~, and (ii) to compare the candidate sites and rank them in the order of their attractiveness as nuclear installation ~~NPP~~ site.	The guide addresses nuclear installation	x			
16.	3.4	This allows the selection of alternative sites in the event the first selected site later encounters serious safety issues	Clarification	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
17.	3.5	The final selection is generally done by the nuclear installation owner organization taking input from the all the stake holders, including neighboring countries where appropriate.	Clarification	x	x The final selection is generally done by the owner organization of the nuclear installation taking input from all the stake holders.		
18.	3.7	Technical constraints and, for NPPs availability of water on regional basis, are also important consideration	Not all nuclear installations require large amount of water….	x			
19.	3.10	Annex~~ure~~ I.	Typo	x			
20.	3.12	for which engineering, site protection or administrative measures are not available or are excessively demanding.	Even if engineering solutions are available, they may be too demanding… See also 3.13	x			
21.	3.13	Transfer to a footnote "Screening out based on an arbitrary safety criterion may discard a site having otherwise favorable safety qualities and finally result in the choice of a site that may be less 'safe' than the one that has been discarded."	This sentence somehow explains the previous one. However, it weakens the overall approach describes in the guide…			x	The sentence is necessary for clarification of the intent.
22.	3.17	Data collection related to potential and candidate sites should focus on attributes of ~~potential and candidate~~ these sites that may play a significant role as exclusion criteria to the extent possible.	Alternative simpler wording	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
23.	3.22	The candidate sites are ranked in order to arrive at the preferred site~~(s)~~ or several preferred sites.	Superfluous	x			
24.	3.23	One preference criterion between candidate sites may be the likelihood that the specific site parameter ~~envelopes~~ <u>are within</u> the standard plant parameter envelope of potential NPP suppliers.	Clarification	x			
25.	4.1	Criteria used in siting process of a nuclear installation are classified as follows · Safety related criteria, · <u>Security related criteria</u> ~~Criteria related to protection against sabotage~~, and · <u>Other</u> ~~Non-safety related~~ criteria.	To maintain a parallel between safety and security. To avoid limiting security aspects to sabotage.		x 3rd bullet is modified as, 'Other Criteria'		Suggestion (second bullet) is not in line with IAEA terminology
26.	4.4	In the bullet list, add : - fire (forest fire…)	To be consistent with annex 1 See also comment on 4.5	x			
27.	4.5 (a) (i)	Oil refineries, chemical plants, hazardous material <u>processing or</u> storage facilities, broadcasting networks, mining or quarrying operations, ~~forests,~~ other nuclear facilities, high energy rotating equipment	Clarification.	x			
28.	4.5	In the bullet list, add : - electromagnetic interference	To be consistent with annex 1 Not to limit to broadcasting network	x			
29.	4.6 (e)		What is the rationale for including this common cause failure issue in this paragraph ?			x	This necessary for multiunit sites
30.	Title before 4.9	~~CRITERIA RELATED TO PROTECTION AGAINST SABOTAGE~~ <u>SECURTY RELATED CRITERIA</u>	See comment on 4.1			x	Proposed modification is not in line with IAEA terminology.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
31.	4.9	Following criteria should be considered to site a nuclear installation in a location from the consideration of ~~security protection against sabotage~~.	See comment on 4.1			x	Suggestion is not clear
32.	4.9 (d)	Site characteristics should be such that ultimate heat sink, if any, could not be easily accessed	Not all nuclear installations require a heat sink…	x			Ultimate heat sink is always there for a power plant
33.	4.10	Criteria related to security ~~protection against sabotage~~ to be used in siting process are generally discretionary type and is also used for ranking purpose.	See comment on 4.1			x	Proposed modification is not in line with IAEA terminology.
34.	Title before 4.11	~~CRITERIA NOT SPECIFICALLY RELATED TO SAFETY~~ OTHER CRITERIA	See comment on 4.1	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
35.	4.11	In the site survey and site selection process another set of criteria are concerned with considerations that are not directly related to <u>security nor</u> nuclear safety. They need to be considered together with safety <u>and security</u> related aspects in an interactive manner	To emphasize safety and security integration vs other criteria		x: modified as In the site survey and site selection process another set of criteria are concerned with considerations that are not directly related to nuclear safety or protection against sabotage. They need to be considered together with the nuclear safety related aspects related to protection against sabotage in an interactive manner……..		For consistency with IAEA terminology
36.	4.12	Delete (b)	This is a safety related criteria, at least for normal operation of a NPP			x	This is an important aspect to be considered in site selection process.
37.	4.12 (e)	Delete (e)	Access to the grid is a safety related criteria as electricity off-site supply is a key parameter.	x			

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38.	5.1	If a potential site could not satisfy all the screening criteria based on collected information during site survey stage but is likely to satisfy these criteria with the help of additional study/investigation, such investigation / study and the related screening test should be initiated as soon as possible so that their results are available ~~performed~~ in the next stage, i.e. site selection stage.	Clarification	x			
39.	5.5	There is generally a trade-off between the time and effort necessary to compile a detailed, reliable and relevant database and the degree of uncertainty ~~that the analyst should take into consideration~~ allowed at each step of the process.	To avoid mentioning a specific person in the process. Furthermore, this trade-off may not be decided by the analyst	x			
40.	5.8		The proposed list does not cover in the same level of details all the topics identified in 4.4 to 4.7. (natural hazards have a greater emphasis)				All items in the list are dealt with required level of emphasis.
41.	6.3	the site selection for the installation may be considered within the conventional context for the planning of such facilities (e.g. hazardous industry national regulations).	Clarification	x			

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42.	6.7 (a)		The way a "generic PSAR" should be understood should be explained, for example in a footnote		x Following foot note may be added, " Generic PSA means the PSA of the designed unit with generic database without considering site specific and plant specific information"		
43.	6.7 (b)		Same comment as above, the way a "generic PSA" should be understood should be explained, for example in a footnote		x See foot note of Sl. No. 43.		
44.	6.9	Furthermore, ~~the~~ depending on the consequences of the external hazards considered as screening criteria, the protection feasibility and method for the installation may vary.	Typo	x			
45.	6.9	~~For example, a small research reactor may not be protected against a large airplane crash unless a substantial amount of resources are not expended for this purpose which may mean that such protection cannot be considered as feasible.~~ These aspects should be considered when setting up the screening and preference criteria for nuclear installations other than NPPs.	Superfluous. No need to highlight such an example	x			
46.	6.10	Delete 6.10	Superfluous		x		This paragraph is important

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
47.	7.1	As a function of the management system, quality assurance program should be established by the ~~governmental and/or operating~~ organizations~~,~~ and its ~~their~~ contractors directly responsible for selecting the site of a nuclear installation. This is necessary to control the effectiveness of the execution of the siting process.	The other paragraphs are directed at the operating organization, not the regulator.	x			
48.	7.2	The management system ~~quality assurance program~~ should cover	The management system encompass the quality assurance program. Quality assurance is restrictive	x			
49.	7.3	The management system ~~quality assurance program~~ program for siting process is a part of the overall q management system ~~quality assurance program~~ for the nuclear installation project. ~~However, since the activities for site investigation are initiated before the establishment of a nuclear installation project~~, the management system for siting ~~quality assurance program~~ should be established at the earliest possible time consistent with its implementation ~~application~~ in the conduct of activities for site survey and selection stages of the nuclear installation.	The management system encompass the quality assurance program. Quality assurance is restrictive	x			

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50.	7.4	The results of the activities for site investigation should be compiled in a report that documents the results of all in situ work, laboratory tests and geotechnical analyses and more generally safety related evaluations.	Clarification	x			
51.	7.5	The ~~results of~~ studies and investigations should be documented in sufficient detail to permit an independent review.	There is no reason to limit the recommendation to the results.	x			
52.	7.8	When developing the management system ~~structured approach to grading the application of the Quality Assurance Program~~, the following should be considered to have it proportionate to the safety significance of processes and studies/investigations		x			
53.	7.10	[12, 13,~~14~~]	Wrong reference	x			
54.	7.12	To make the activities of site selection process traceable and transparent to users and reviewers~~, the licensee and the regulatory body,~~	Simpler wording	x			
55.	7.15	If earlier studies for site survey and site selection for the same region are available, studies should be made to demonstrate how different approaches or different data affect the earlier conclusions.	Clarification	x			

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56.	7.17	Requirements for implementing a management system program should be established by the responsible organizations to ensure appropriate processes and inputs from ~~that~~ their contractors ~~pay attention to the graded approach.~~	Gradig approach is not the major issue for the management system of contractor.	x			
57.	7.17	The organization responsible for siting ~~organization~~ should identify	Clarification	x			
58.	Appendix A	Transform the appendix into an annex	Information on database content is some kind of detailed guidance. Alternative content may be acceptable.			x	The information provided in the Appendix is necessary and very much in line with the main text
59.	Appendix A 3	Detailed data requirements (for the final site selection process) are the same as those required for ~~nuclear~~ safety and are specified in the relevant Safety Guide	Superfluous			x	The information provided in the Appendix is necessary and very much in line with the main text
60.	Appendix A 6.	Transfer 6. to main text	Worth inserting in the main text, at the appropriate location dealing with this topic			x	Readability of main text will be spoiled making it cumbersome.
61.	Appendix A 19.	Transfer 19. to main text	Worth inserting in the main text, at the appropriate location dealing with this topic			x	Readability of main text will be spoiled making it cumbersome.

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Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
62.	Appendix A 27.	Transfer the last sentence of 27. (The flood level data by itself is not sufficient for screening a site from further consideration since it may be possible to provide flood defenses to protect the site, and this aspect should be considered when making site selection judgments.) to main text	Worth inserting in the main text, at the appropriate location dealing with this topic			x	Readability of main text will be spoiled making it cumbersome.
63.	Appendix A 30	Transfer the last sentence of 30. (The meteorological data by itself is not sufficient for screening a site from further consideration since it is often possible to provide defenses to protect safety related equipment at the site.) as a footnote in the main text	Worth inserting in the main text, at the appropriate location dealing with this topic			x	Readability of main text will be spoiled making it cumbersome.
64.	Appendix A 32	Transfer the last sentences of 32. (The suitability of the site will also depend on the extent that protection measures can be put in place to protect safety related SSC(s). In particular the drainage requirements for the site should be evaluated in detail, and the geotechnical features of the site will need to be determined, at least approximately, and their sensitivity to extremes of precipitation, temperature and drought established. Information provided in the Safety Guide [8] will be useful for further work on this area.) in the main text	Worth inserting in the main text, at the appropriate location dealing with this topic			x	Readability of main text will be spoiled making it cumbersome.

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Reviewer: F. Féron Country/Organization: France /ASN			Page Date: 31 May 2011	Date 2011-08-15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
65.	Appendix A 33	Transfer the last sentences of 33. (At both the site survey and site selection stages, the suitability of the site is not solely determined by the site's proximity to human induced events, but should also consider the credible protection measures that can be put in place as well. For example, protection barriers can usually be erected to protect safety related equipment against vehicle impacts) in the main text	Worth inserting in the main text, at the appropriate location dealing with this topic			x	Readability of main text will be spoiled making it cumbersome.
66.	Appendix A 34	In the second bullet list, add "fire (thermal wave..)"	Missing hazard	x			
67.	Appendix A 35	Transfer the last sentences of 35. (It is anticipated that many of the hazards listed above can be eliminated on the basis that their effects are very local to the source and unlikely to affect the site directly, e.g. missiles from small scale pressurized systems, or can easily be protected against, such as impacts from road traffic/rail vehicles. Other hazards may require a more detailed analysis from the next stage before a judgment can be made in respect of site selection.) in the main text	Worth inserting in the main text, at the appropriate location dealing with this topic			x	Readability of main text will be spoiled making it cumbersome.
68.	Appendix A 36	<u>For example,</u> it is anticipated that this will apply to the following	Not an exhaustive list		X Modified as suggested		
69.	Appendix A 38	Transfer the last sentences of 38. (Care should be taken to use reasonable numbers for screening values. It should also be noted that these values are country dependent.) in the main text	Worth inserting in the main text, at the appropriate location dealing with this topic				

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron Country/Organization: France /ASN			Page Date: 31 May 2011	Date 2011-08-15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
70.	Appendix A 39	Transfer the last sentences of 39. (Depending on the regulatory requirements of the country this process may be more or less involved. <u>If no pre-established emergency zoning requirements are in force</u>, attention should be paid mainly to the feasibility of emergency plan implementation in terms of effectively sheltering and evacuating the population in the external zone of the installation.) in the main text	Worth inserting in the main text, at the appropriate location dealing with this topic. However, simplify to avoid use of EAB, LPZ, EPZ….			x	Readability of main text will be spoiled making it cumbersome.
71.	Annex I I.1	Table I-1 provides an indication of the type of criteria that is generally associated with various issues related to siting process. ~~It should be pointed out that there may be cases which are not consistent with Table I-1 due to the specific conditions of certain sites. Therefore,~~ Table I-1 should be used only as a first indication.	Superfluous. With such caution, is it worth keeping the table ?			x	Useful to the MS for especially the new entrant
72.	Annex I I.2	Guidance provided in the Safety Standards <u>is</u> ~~would be~~ useful for issues related to evaluation of candidate sites.	It is a fact…	x			
73.	Annex II II.2	Provisions given in this Annex <u>are</u> on the events of accidental origin and / or natural phenomena envelope	Typo	x			
74.	Annex II II.3	• Aspects not directly related to ~~nuclear~~ safety The last set, though not directly related to ~~nuclear~~ safety, is considered to have important bearing on effective siting process.	Superfluous			x	For completion of example, it is necessary
75.	Annex II II.6 2. ii)	Add “snow”		x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron Country/Organization: France /ASN			Page Date: 31 May 2011	Date 2011-08-15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
76.	Annex II II.7 1. ii)	Chemical plants and other hazardous substances processing facilities	Clarification	x			
77.	Annex II II.7 1. iii)	Hazardous substances storage facilities	clarification	x			
78.	Annex II II.7 5 and 6	5 Disposal of radioactive waste during normal operation i) Radioactive Solid waste a. Quantity b. Level of activity c. Method of disposal ii) Radioactive Liquid discharge ~~waste~~ a. Quantity b. Level of activity c. Method of disposal iii) Radioactive gas discharge ~~release~~ a. Quantity b. Level of activity c. Method of disposal	To be consistent between gaseous and liquid discharge	x			
79.	Annex II II.7 6	6 ~~Disposal of radioactive waste~~ Radioactive releases during accident conditions i) Gaseous release ~~Solid waste~~ a. Quantity b. Level of activity c. Method of disposal ii) Liquid release ~~waste~~ a. Quantity b. Level of activity c. Method of disposal ~~iii) Radioactive gas release~~	Not point in looking at radioactive solid waste during an accident	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron Country/Organization: France /ASN			Page Date: 31 May 2011	Date 2011-08-15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
80.	Annex II II.9 4	Special considerations prescribed by the regulatory authority for special emergency planning zones, ~~such as exclusion zone boundary, low population zone etc.~~	No need to use example of zones			x	Useful to the MS for especially the new entrant
81.	Annex II II.9 5	Population considerations within each of the emergency planning zone ~~i) Exclusion zone (population in this zone is plant personnel)~~ ~~ii) Sterilized or low population zone~~ ~~iii) Emergency planning zone~~ ~~iv) Radiation monitoring Zone~~	No need to specify zones (and to be consistent with previous comment)			x	Useful to the MS for especially the new entrant
82.	Annex II II.10 2	ii) Nearest national highway and major road ~~iii) Nearest district road~~	Clarification	x			
83.	Annex II II.10 5	~~Availability and access conditions to cooling water~~ ~~i) Condenser cooling~~	Duplicate II.6.3			x	It is different from II6.3
84.	Annex II, II.11 to II.25	Delete II.11 to II.25	Too detailed. Agreeing on figures won't be possible (e.g. Tabvle II.1…)			x	Useful to the MS for especially the new entrant
85.	Annex III	Delete the whole Annex III	Too detailed. Too much oriented cost and not safety.			x	Useful to the MS for especially the new entrant
86.	/						

Comments Resolution: Draft Specific Safety Guide DS433 "Safety Aspects in Siting of Nuclear Installations", Version 2011-05-02

	COMMENTS BY REVIEWER Reviewer: S. Geupel Country/Organization: Germany/GRS		Page 1 of 13 Date: 2011-06-01		RESOLUTION Date:2011-08-15			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2	1	1.7	2nd sentence: "The revision is necessary to streamline the Safety Guide with respect to Ref. [1] and [15] for covering the first stage of the siting process taking into account the safety requirements, especially in relation to the exclusion criteria to be applied, and all the complete set of current safety guides …"	Text should also provide a link to the IAEA Draft Safety Guide DS424 "Establishing the Safety Infrastructure for a Nuclear Power Programme" (current version: 2011-04-07). In DS424, the Actions 160 – 169 "Site survey and site evaluation" (paras 3.24 – 3.48) contain many overlaps with DS433, especially with Section 2. Add DS424 as ref. [15] to the list of references.	x			
2	2	1.14	1st sentence: "This Safety Guide addresses an extended range of nuclear installations as defined in Ref. ~~[3]~~ [1]: …"	Cited ref. [3] is wrong; text refers to the IAEA Safety Requirements NS-R-3 (para 1.9).	x			
3	3	2.3	1st sentence: "The siting process for a nuclear installation consists of the first two stages …" 2nd sentence: "In site survey stage, large regions are investigated …"	Editorial.	x			

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

	COMMENTS BY REVIEWER Reviewer: S. Geupel Country/Organization: Germany/GRS			Page 2 of 13 Date: 2011-06-01	RESOLUTION			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	4	2.4	Note: In connection with the 1st sentence, the statement in the 2nd sentence "Thus, site evaluation continues through the entire lifetime of the installation …" seems to be not correct. Decommissioning is also a stage in the lifetime of a nuclear installation, as stated in many other IAEA Safety Standards.	Clarification in order to avoid inconsistencies in IAEA Safety Standards. Regarding the stages in the lifetime of a nuclear installation, see e.g. • NS-R-5 "Safety of Nuclear Fuel Cycle Facilities" (para 1.4) • NS-R-4 "Safety of Research Reactors" (para 1.15)			x	See IAEA glossary for definition on lifetime of an nuclear installation
3	5	Figure 2	replace "SITING EVALUATION" by "SITE EVALUATION"	Editorial. Compare with Figure 1.	x			
2	6	3.3	modify step (3): "… (i) to evaluate the site in order to assure there are no features at the sites that would preclude the construction and operation of a ~~NPP~~ nuclear installation, and (ii) to compare the candidate sites and rank them in the order of their attractiveness as a ~~NPP~~ nuclear installation site."	See para 1.14 of this document: "This Safety Guide addresses an extended range of nuclear installations …"	x			
3	7	3.5	2nd sentence: "The final selection is generally done by the owner organization taking input from the all the stakeholders."	Editorial.	x			
3	8	3.10	2nd sentence: "Screening and ranking criteria are further elaborated in Annex~~ure~~ I."	Editorial.	x			

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

	COMMENTS BY REVIEWER Reviewer: S. Geupel Country/Organization: Germany/GRS		Page 3 of 13 Date: 2011-06-01		RESOLUTION			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	9	4.2	1st sentence: "Safety related criteria to be considered in the siting process should be consistent with the requirements in IAEA NS-R-3 ~~[2]~~ [1] and …"	Cited ref. [2] is wrong.	x			
3	10	4.4 (i)	"Geotechnical hazards such as slope instability, soil liquefaction, landslides, rock fall, permafrost, erosion processes, subsidence, uplift, collapse"	Completeness. Compare with Annex II (para II.6) and NS-R-3 (Section 3).	x			
3	11	4.5	2nd sentence: "In this context and in accordance with the recommendations presented in Ref. [3], the following sources for ~~the~~ human induced hazards should be considered: (a) Stationary sources (i) … broadcasting and communication networks, …; (ii) … (b) Mobile sources …"	The sources for human induced events specified in (a) and (b) are taken from NS-G-3.1 (Table I). Completeness. Compare with Annex II (para II.7).	x			
1	12	4.6 (d)	"Population density and population distribution and distance to centers of population including projections for the lifetime of the nuclear installation"	With respect to off-site arrangements for the response to a nuclear or radiological emergency, the population density of the external zone is a very important aspect. Compare with NS-R-3 (para 2.1) and NS-G-3.2 (paras 5.3 and 6.3).	x			

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

	COMMENTS BY REVIEWER Reviewer: S. Geupel Country/Organization: Germany/GRS			Page 4 of 13 Date: 2011-06-01	RESOLUTION			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2	13	4.6	add new subpara (f): "Uses of land and water in the region"	See NS-R-3 (para 4.14) and NS-G-3.2 (Section 4).	x			
2	14	4.7	2nd sentence: "In this context, the following phenomena should be considered: (a) Physical site characteristics that may hinder emergency plans (particular geographical features such as islands, mountains and rivers) (b) Infrastructure characteristics related to the implementation of emergency plans (especially local transport and communications networks) (c) Population considerations (e.g. special groups of the population who are difficult to evacuate or shelter) (d) Special considerations prescribed by the Regulatory Body … (e) Industrial facilities which may entail potentially hazardous activities (f) Agricultural activities that are sensitive to possible discharges of radionuclides (g) Impact of concurrent external events on infrastructure.	Clarification and completeness. Compare with IAEA Safety Guide NS-G-3.2 (para 6.3).	x			

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

	COMMENTS BY REVIEWER Reviewer: S. Geupel Country/Organization: Germany/GRS			Page 5 of 13 Date: 2011-06-01	RESOLUTION			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	15	4.10	"Criteria related to protection against sabotage to be used in siting process are generally discretionary type and ~~is~~ are also used for ranking purpose."	Editorial.	x			
3	16	4.12 (c)	"Transport routes and communication networks"	Completeness.	x			
3	17	4.12 (e)	"Considerations for the power distribution network (grid)"	Completeness.	x			
3	18	5.8 (g)	"Meteorological extreme and rare events database"	Completeness. See IAEA Draft Safety Guide DS417 (Section 4).	x			
3	19	5.8 (i)	"Population and environmental aspects database"	Completeness.	x			
3	20	5.13 (b)	"Effects at the proposed site of nearby industrial facilities, for example impact of fires and chemical explosions, dispersion analysis for toxic plumes that could affect the site."	Completeness.	x			
3	21	5.13 (d)	"Possibly an estimate of seismically induced soil liquefaction potential at the site."	Completeness.	x			
3	22	6.9	"… Furthermore, ~~the~~ depending on the consequences of the external hazards considered as screening criteria, the protection feasibility and method for the installation may vary. For example, a small research reactor may not be protected against a large airplane crash unless a substantial amount of resources are ~~not~~ expended for this purpose which may mean that such protection cannot be considered as feasible …"	Editorial.	x			

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

	COMMENTS BY REVIEWER Reviewer: S. Geupel Country/Organization: Germany/GRS		Page 6 of 13 Date: 2011-06-01		RESOLUTION			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2	23	7.10	2nd sentence: "See Refs ~~[13, 14]~~ [12, 13] for requirements, recommendations and guidance on management systems."	Cited ref. [14] is wrong; text refers to the IAEA Safety Standards GS-R-3 and GS-G-3.1.	x			
3	24	Ref. [9]	INTERNATIONAL ATOMIC ENERGY AGENCY, ~~GS-R-1, Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety (2000).~~ Governmental, Legal and Regulatory Framework for Safety, IAEA Safety Standards Series No. GSR Part 1, IAEA, Vienna (2010).	GSR Part 1 has superseded the previous Safety Requirements GS-R-1.	x			
3	25	Ref. [10]	INTERNATIONAL ATOMIC ENERGY AGENCY, ~~DS 416~~ Licensing process for nuclear installations, ~~Draft (2008).~~ IAEA Safety Standards Series No. SSG-12, IAEA, Vienna (2010).	The new Safety Standard was published in October 2010.	x			
3	26	Ref. [11]	INTERNATIONAL ATOMIC ENERGY AGENCY, ~~NG-G-3.1~~ Milestones in the Development of a National Infrastructure for Nuclear Power, IAEA Nuclear Energy Series No. NG-G-3.1, IAEA, Vienna (2007).	Editorial.	x			
3	27	Ref. [14]	INTERNATIONAL ATOMIC ENERGY AGENCY, IAEA Safety Glossary: Terminology Used in Nuclear Safety and Radiation Protection, 2007 Edition, IAEA, Vienna (2007).	Editorial.	x			

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

	COMMENTS BY REVIEWER Reviewer: S. Geupel Country/Organization: Germany/GRS			Page 7 of 13 Date: 2011-06-01	RESOLUTION			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	28	Ref. [15]	INTERNATIONAL ATOMIC ENERGY AGENCY, Establishing the Safety Infrastructure for a Nuclear Power Programme, Safety Guide, Draft Safety Standard DS424	Add IAEA Draft Safety Standard DS424 to the list of references (see comment to para 1.7).	x			
3	29	Appendix A, 2.	"The database should be compiled to support the evaluation and judgment of relevant number of thematic sets given in ~~Section 4.0~~ para 5.8."	Editorial.			x	Correctly given in Sect 4.0
2	30	Appendix A, 3.	2nd sentence: "Detailed data requirements (for the final site selection process) are the same as those required for nuclear safety and are specified in the relevant Safety Guides ~~[6]~~ [5] and [8]."	Cited ref. [14] is wrong; text refers to the IAEA Safety Standards SSG-9 and NS-G-3.6.	x			
2	31	Appendix A, 6.	add new last sentence: "… should be considered. Detailed data requirements (for the final site selection process) are the same as those required for nuclear safety and are specified in the Safety Guide [5]."	Text should provide a link to the relevant IAEA Safety Standard SSG-9.	x			
2	32	Appendix A, 9.	last sentence: "A clear definition of capable faults is given in the Safety Guide ~~[6]~~ [5] together with recommended site investigations …"	Cited ref. [6] is wrong; text refers to the IAEA Safety Standard SSG-9 (Section 8).	x			
2	33	Appendix A, 17.	last sentence: "Detailed data requirements are similar to those recommended in the relevant Safety Guide ~~[10]~~ [8]."	Cited ref. [10] is wrong; text refers to the IAEA Safety Standard NS-G-3.6.	x			

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

	COMMENTS BY REVIEWER Reviewer: S. Geupel Country/Organization: Germany/GRS		Page 8 of 13 Date: 2011-06-01		RESOLUTION			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2	34	Appendix A, 24.	4th / 5th sentence: "The Safety Guide ~~[8]~~ [6] provides simple screening criteria … If the proposed site does not satisfy the conditions for applying the screening criteria in ~~[8]~~ [6], then …"	Cited ref. [8] is wrong; text refers to the IAEA Draft Safety Standard DS417.	x			
2	35	Appendix A, 26.	2nd sentence: "Information provided in the Safety Guide ~~[8]~~ [6] will be useful for further work on this area."	Cited ref. [8] is wrong; text refers to the IAEA Draft Safety Standard DS417.	x			
2	36	Appendix A, 29.	last sentence: "Information provided in the Safety Guide ~~[8]~~ [6] will be useful for further work on this area."	Cited ref. [8] is wrong; text refers to the IAEA Draft Safety Standard DS417.	x			
3	37	Appendix A, 31. (a)	"… data on rare meteorological events, such as tornado, cyclone, lightening should be collected."	Editorial.	x			
2	38	Appendix A, 32.	last sentence: "Information provided in the Safety Guide ~~[8]~~ [6] will be useful for further work on this area."	Cited ref. [8] is wrong; text refers to the IAEA Draft Safety Standard DS417.	x			
2	39	Appendix A, 36.	last sentence: "Further guidance on undertaking these analyses is available in Safety Guide ~~[11]~~ [3]."	Cited ref. [11] is wrong; text refers to the IAEA Safety Standard NS-G-3.1 (Sections 5 – 7).	x			
2	40	Appendix A, 39.	last sentence: "Information provided in the Safety Guide ~~[9]~~ [4] will be useful for further work on this area."	Cited ref. [9] is wrong; text refers to the IAEA Safety Standard NS-G-3.2 (Section 5).	x			

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

	COMMENTS BY REVIEWER Reviewer: S. Geupel Country/Organization: Germany/GRS			Page 9 of 13 Date: 2011-06-01	RESOLUTION			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	41	Annex II, II.1	2nd sentence: "This annex is intended to be used by the stakeholders associated with the siting process of NPP."	Editorial.	x			
3	42	Annex II, II.3	2nd bullet point: "External human-induced hazards."	Completeness.	x			
3	43	Annex II, II.6	2. ii) "d. Lightening"	Editorial.	x			
2	44	Annex II, Table II.1	Note: Text attached to footnote # is missing.	Missing information.	x			
3	45	Annex II, II.13	1st sentence: "… considering all radiation exposure pathways including inhalation and ingestion doses and without taking any account for ~~taking~~ any emergency counter measures in public domain."	Editorial.	x			
2	46	Annex II, II.16	last sentence: "For extreme values of meteorological variables, data collected during a minimum period of continuous observation of at least 30 years is needed for estimating~~ed~~ their annual frequency of exceedance of 10^{-2} since the estimate of the hazard cannot be assessed with enough accuracy for values above 3 to 4 times the length of the sample."	Clarification and additional information for the reader of the document. Compare with IAEA Draft Safety Standard DS417 (footnote 8 to para 3.7).	x			
3	47	Annex II, II.17	"In case of rare meteorological phenomena (e.g. light~~e~~ning; …"	Editorial.	x			

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

	COMMENTS BY REVIEWER Reviewer: S. Geupel Country/Organization: Germany/GRS		Page 10 of 13 Date: 2011-06-01		RESOLUTION			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	48	Annex II, II.19	2nd sentence: "Guidelines on such additional margin ~~is~~ are given in the IAEA Safety Standard~~,~~ "Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations~~"~~ DS~~7~~417."	Editorial.	x			
3	49	Annex II	Note: check numbering of paras in the subsection "EMERGENCY MANAGEMENT PROCEDURE"	Multiple existence of paras II.24 and II.25.	x			
2	50	Annex II	subsection "EMERGENCY MANAGEMENT PROCEDURE", para II.25 "Content of off-site emergency procedure", part 3), subpoint ii) "Radiation doses (~~IL s and DIL s~~ intervention levels and derived intervention levels), domain and counter measures"	The abbreviations IL and DIL should be avoided here because they are not common knowlege.	x			

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

Resolution of: Member State Comments on IAEA Draft Safety Guide "Safety Aspects in Siting for Nuclear Installations" (DS433)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: US NRC Country/Organization: United States of America			Date: 6/10/11	Date: 08/15/11			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	Should publication of the standard await incorporation of some key lessons learned from the most recent events at Fukushima nuclear power plant site and the Kashiwazaki site?	Impact of the lessons learned from Fukushima and Kashiwazaki sites can result in additional insights.			x	We carefully reviewed the document against lessons learned from Fukushima accident (ministerial conference and Fact Finding Mission Report). Also we had consultations with the key experts (on this subject) that participated to the Facts Finding Mission to Fukushima. All lessons learned so far on this subject deal with detailed hazards characterization. Please note that all site safety related aspects SHALL BE addressed and confirmed during site evaluation process which is outside the scope of this SG and is covered in NS-R-3 + other 6 safety guides. It should be stressed that site selection is a de-regulated activity. Considering all above we believe that lessons learned are included in this SG by providing guidelines how to consider safety aspects early in the site survey

COMMENTS BY REVIEWER Reviewer: US NRC Country/Organization: United States of America Date: 6/10/11				RESOLUTION Date: 08/15/11			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
							stage.
2	3.18/1 and 2	To illustrate the type of criteria used in the siting process, some screening criteria and requirements are listed below. A more complete listing of screening criteria and requirements are provided in Ref-1.	Clarification The intent of paragraph 3.18 is not clear and the introductory sentence is not accurate. The first sentence of paragraph 3.18 states that safety requirements cited from Reference 1 are elaborated on. However, the list that follows gives excerpts from Reference 1 with no explanation of the screening criteria listed. Thus, there has been no elaboration of the criteria. If the purpose is to list screening criteria and not elaborate on those criteria, that should be stated.			x	Paragraph 3.18 introduce the requirements from NS-R-3 that could be associated to exclusion criteria that should be observed for screening (without any changes). In such cases there are certain IAE editorial rules that shall be followed (this is explained in the brackets – that explanation is not part of the guide – is just an editorial indication).
3	3.18	Text from comment 1 may be sufficient and/or some additional text clarifying why criteria listed in 3.18 are presented could be added.	Clarification There are many criteria from Reference 1 that are not provided in Paragraph 3.18. It is not clear why specific criteria from Reference 1 were included or excluded from Paragraph 3.18.			x	As explained for comment 2 the selected list of requirements deal with exclusion criteria that should be observed in the screening process.
4	3.18/Criteria 3	3 Where reliable evidence shows the existence of a capable fault [a fault that may cause surface displacement near the nuclear facility] that has the potential to affect the safety of the nuclear installation, an	Clarification As listed, screening criteria 3 from paragraph 3.18 may cause confusion regarding seismic screening criteria for some readers. In Reference 1, this criteria is listed under the subheading of surface faulting which makes the criteria			x	Is same as Paragraph 3.7 from NS-R-3 which defines exclusion criteria. A capable fault can deliver earthquakes. Surface rupture could be consequence of an earthquake (if the earthquake is big

COMMENTS BY REVIEWER Reviewer: US NRC Country/Organization: United States of America Date: 6/10/11				RESOLUTION Date: 08/15/11			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		alternative site should be considered.	clear. The following was added [a fault that may cause surface displacement near the nuclear facility] The additional text on surface faulting clarifies the text.				enough). It is much easy to assess if a fault is capable than the surface rupture effect will occurred. It is safe to exclude a site (in site selection process) if a capable fault is found in the vicinity. Please note that during site survey and site selection is not practical to conduct detailed hazards evaluations for all possible and/or candidate sites).
5	Page 18, Section 3.8	Exclusion criteria: the exclusion criteria discard sites that are unacceptable from those attributes related to issues, or events or phenomena or hazard for which engineering solution are not generally practicable. Several criteria (e.g. ground rupture) are listed in Table I-1. Screening and Ranking Criteria for Site Selection.	The original text states that only a few exclusion criteria fall into this category; however, Table I-1 lists several that are applicable.			x	Section 3.18 defines the two categories of criteria. The list of criteria is given in Table I-1 from the Annex.
6	Page 18, Section 3.8	Discretionary criteria: the discretionary criteria are associated with those	The original text should refer to Table I-1 which lists several	x			

COMMENTS BY REVIEWER Reviewer: US NRC Country/Organization: United States of America Date: 6/10/11				RESOLUTION Date: 08/15/11			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		attributes related to issues, or events, or phenomena or hazards, or considerations for which engineering solutions are available to mitigate their impact. These criteria, listed in Table I-1, are used to facilitate the selection process through iterative screening to eliminate less favorable sites when a large number of possible candidate sites exist.	discretionary criteria.				
7	Page 48, Table I-1	Update Table based on Reason.	Update Table I-1 to include sites with extensive oil and gas extraction history.	x			
8	4.4/ (i)	Geotechnical hazards such as liquefaction, landslides, rock fall, permafrost, erosion processes, subsidence, collapse, and expansion	<u>Completeness</u> Added expansion to list of geotechnical hazards to be more comprehensive.	x			Collapse and expansion is covered by subsidence, landslides is covered by slope stability (erosion and permafrost are added)
9	5.9/4	Each of the databases is described in Appendix A, and criteria associated with the databases are listed in Table I-1.	<u>Clarification</u> The original sentence just stated databases are described below. However, a description of the databases was not provided in Section 5, below 5.9. More	x			

COMMENTS BY REVIEWER Reviewer: US NRC Country/Organization: United States of America Date: 6/10/11				RESOLUTION Date: 08/15/11			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			information is on the databases is provided in Appendix A and Annex I.				
10	6.3/1-3	Change, “Prior to categorizing an installation for the purpose of adopting a graded approach, a conservative analysis should be performed in which it is assumed that the entire radioactive inventory of the installation is released by the potential external hazard initiated accident.“ Insert, “Prior to categorizing an installation for the purpose of adopting a graded approach, a conservative process may be applied to estimate the consequences of a radiological release in which it is assumed that the entire radioactive inventory of the installation is released by the potential external hazard initiated accident. The analysis should use the worst case radioactive inventory expected during the life of the installation and should not include any mitigating factors associated with siting	The change clarifies that the prescreening process should be a worst-case analysis accounting for changes in radioactive inventory over the life of the installation. In order to perform a worst-case analysis as a prescreening process, mitigating factors associated with a site should be ignored or made conditions of the site selection.	x			

COMMENTS BY REVIEWER Reviewer: US NRC Country/Organization: United States of America Date: 6/10/11				RESOLUTION Date: 08/15/11			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		(e.g., atmospheric dispersion), unless those factors are included in the final site selection acceptance criteria"					
11	6.3, 6.4	Paragraph 6.3: Delete, "Provided that the potential result of such a radioactive release were that no unacceptable consequences would be likely for workers or for the public (i.e. provided that doses to workers or to the public due to the release of that radioactive inventory would be below the authorized dose limits established by the regulatory body), or for the environment, and provided that no other specific requirements are imposed by the regulatory body for such an installation, the site selection for the installation may be considered within the conventional context for the planning of such facilities." Insert, "Provided that the potential result of such a radioactive release was that no significant consequences	Paragraph 6.3 recommends performing an analysis of a release of all radioactive material from the installation to determine if there would be any "unacceptable consequences" for workers or for the public (i.e., doses above the limits established by the regulatory body. Paragraph 6.4 uses the term "significant." Revise the paragraphs to use consistent terminology.	x			

COMMENTS BY REVIEWER Reviewer: US NRC Country/Organization: United States of America Date: 6/10/11				RESOLUTION Date: 08/15/11			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		would be likely for the public or for the environment, and provided that no other specific requirements are imposed by the regulatory body for such an installation, the site selection for the installation may be considered within the conventional context for the planning of such facilities."					
12	6.3	Remove references to "workers" from this paragraph.	It is unclear why radiological consequences for workers would influence site selection since, presumably, workers would be inside the installation boundary where the characteristics of the site would not affect the radiological consequences.	x			
13	Appendix A, 7/ 1 - 3	Using available earthquake catalogues, major earthquakes which may have had significant impacts on the proposed site should be selected for … taking account of the characteristics of causative faults.	<u>Clarification</u> State why the major earthquakes are being selected. This will make the meaning and purpose of the paragraph clear.	x			
14	Annex II.6 vi)	g. Collapse, subsidence h. Expansion, uplift i. Stability of foundation	<u>Completeness and Clarification</u> Collapse and subsidence both indicate volume decrease. Whereas, uplift and expansion both indicate soil volume increase.	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
			Adding expansion makes the list more comprehensive and placing it on a separate line with uplift increases clarity. Another comment: Both slope instability and landslides are listed on separate lines. It seems that both of these hazards could be listed on the same line (e.g. a. Landslides and slope instability), unless there is a need to separate potential failure of man-made slopes from natural slopes.				
15	Annex II.20	Site specific design ground motion (DBGM) parameters for earthquakes are derived to meet a target performance goal.	<u>Clarification</u> The sentence in Annex II.20 states design basis ground motion parameters for earthquakes are derived for an annual frequency of exceedance not less than 10^{-4}. This may not be universally accurate. According to ASCE 43-05 for a seismic design category 5, limit state D structure, the design response spectra is equal to a design factor multiplied by the uniform hazard spectra having a mean annual frequency of exceedance of 10^{-4}. The design factor is a function of the spectral acceleration having a 10^{-5} mean annual frequency of		x		The Annex II is not part of the SG – shows only examples of criteria. However if the performance goal for CDF (internal and external events) is 1E-5 and DBMG is anchored to 1E-3 than such CDF performance goal cannot be achieved especially in areas with moderate and high seismicity. This is why we strongly recommend the mean DBMG to have the

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			exceedance. Thus, instead of mentioning a specific annual frequency of exceedance in Annex II.20, it may be better to refer to a target performance goal.				annual frequency of excedeence les or equal to 1E-4 (for the new builds). Mentioning only the performance goal could be unpractical for embarking countries where such regulations and guidelines do not exist.

Resolution Comments: IAEA Draft Safety Guide DS 433

COMMENTS BY REVIEWER Reviewer: Date: 10 June 2011 Country/Organization: EC				RESOLUTION Date: 15 August 2011			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1.4, 5 line	Add " external" in front of "hazards"	clarification	x			
2	1.4 line 7	Replace "good" with "favorable"	editorial	x			
3	1.4, 9 line	*Replace " conductive for" with "would facilitate"*	editorial	x			
4	1.5	*Delete 3rd sentence*	Text not clear			x	
5	1.7	*Replace the 1.7 with " The current guide replaces the IAEA Safety Guide "Site Survey for Nuclear Power Plants", 50-SG-S9 and gives recommendations for the initial screening of suitable nuclear installations sites"*	Simplification; The current text justifies the revision of 50-SG-S9 which should be in the DPP, but not in the guide itself.			x	DS433 give guidance for the Siting Process not only for initial screening. Siting process includes Site Survey (includes screening) and site selection stages (includes ranking).
6	1.9, 1 line	*Replace" related to" with "concerned with"*	editorial	x			
7	1.10 3 line	*Delete "cooling water availability"*	Cooling water availability IS a safety related issue			x	Most of the water demand is for condenser cooling (non-safety) and 10% of this is needed for heat removal (during full power operation). So it is for both safety

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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
							and non-safety (difficult to separate).
8	2.3	*Second sentence is not clear*	clarification			x	The siting process is described in Chapter 2. Siting process include site survey where potential sites are identified. After successive screenings the list of candidate sites is obtained. Second stage deals with ranking process where the ranking criteria applied to the candidate sites and to identify the most favorable sites.
9	3.2, 3 line	*Replace "lesser" with "less favorable"*	editorial	x			
10	3.3	*Add at the end of (1)" without appropriate justification"*	clarification	x			
11	3.7	*Same comment as for 3.3*		x			
12	3.9-3.23	*Consider revision*	The text on ranking criteria is rather week. After Fukushima don't we want to explicitly list			x	Exclusion criteria should be observed before ranking. The candidate sites (after

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			some exclusion criteria related to high hazards?				exclusion criteria apply) should be all suitable. Screening and ranking criteria are further elaborated in Annex I (ranking criteria includes safety and non-safety related considerations).
13	3.27	*Replace last sentence with " Possibility for having such communication shall be considered"*	The current writing is relevant to the design stage, not to site survey/ selection			x	When the new facility forms part of an existing nuclear site we consider that information exchange between site operators (existing operator and the new operator if they are different) should be initiated as early as possible in site selection stage.
14	4.6 (e)	*Delete (e)*	It is not clear what is meant by CCF here			x	Is one of the Fukushima lessons learned where external hazards constitute a Common

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							Cause Failure for multiple units.

Resolution of: ENISS Comments on IAEA DS433, DRAFT SPECIFIC SAFETY GUIDE No.00.08: Safety Aspects in Siting for Nuclear Installations (02 May 2011)

COMMENTS BY REVIEWER Reviewer: Jean-Pierre Berger / Gerd Bassing Country/Organization: ENISS				Nb. of Pages: 6 Date: 10 June 2011	RESOLUTION Date: 2011-08-15			
Comment No.	Para/ Line No.	IAEA text :	Proposed new text :	Reason :	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
General Comment		**General comments :** ENISS appreciates the possibility to comment this draft, DS433, because the safety aspects in siting for new Nuclear Installation are an important topic in particular in consideration of the recent events of Japan. This text is well built, consensual and rich in relevant information. However, it was written before the accident of Fukushima (the draft is dated 2011/01/27) and the glance in terms of requirements or recommendations that we could get now about the selection of a site for the setting-up of a (new) nuclear installation should be more sharpened and deepened. Two examples to illustrate this comment: **Screening values :** It is advisable to be very careful with the values of criteria for the selection of a potential site proposed in the table II - I of the chapter II.11 “example of screening values” of the appendix II. These values will be certainly re - questioned in the light of the REX FUKUSHIMA (e.g. values 1 and 13 "distance from a capable fault” and "tsunami"). **Equivalent of the "maximal flood safety level" for the coastal sites :** In paragraph II. 18 " Flood " of the appendix II, it seems that the proposed values for the equivalent of the "maximal flood safety level" are a little bit low (2 of the II. 18) with regard to the values recommended in the French reference table "Flood" established further to the flooding feedback experience of BLAYAIS nuclear power plant. It seems necessary "to rethink" this process of selection of the nuclear sites in the light of Fukushima lessons, taking into account the hypothetical implementation of emergency plans (measures of evacuation). This document provides a rational and structured approach to assist national processes of site selection for nuclear installations. It considers all the main factors that need to be considered in site selection from a technical perspective. However, national circumstances and policies also						Appendix II is not part of the guidelines. Presents only examples of criteria used by Member states. The idea of ranking was also included in the old was SSG-S9 and it is a demand from the embarking countries. Ranking process is used after all exclusion criteria based on safety considerations have been applied. All candidate sites (input for the ranking process) supposed to be suitable sites. The ranking is intended to differentiate the most attractive sites (e.g. lower exposure to external hazards

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Comment No.	Para/ Line No.	IAEA text :	Proposed new text :	Reason :	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		need to be brought to bear in siting decisions, and the importance of early engagement with local populations in regions where candidate sites may be identified is an essential part of the selection process. These considerations must be factored into the site selection process, but are separate from the safety considerations addressed by the IAEA draft. Finally the idea of ranking candidate sites seems to be potentially dangerous. It is technically very difficult (as explained in 3.19) to compare "across the topics" (*a site with higher seismic hazard but lower flood hazard with another site having the opposite characteristics*). Ranking plants is always counter-productive in particular at the communication level and must be avoided.						reflected)
1	3.18; pt 6	The hazards associated with an airplane crash to be considered should include impact, fire and explosions. If the assessment indicates that the hazards are unacceptable and if no practicable solutions are available, then the site should be deemed unsuitable. The airplane crash event mentioned here is considered to be of accidental origin.		Comment: it is not necessary to specify that the airplane crash is accidental. WENRA and the EU are considering it deterministically and even the NRC for design not yet certified considers it deterministically. In any case airplane crash refers more to installation design than to site screening.			x	The big commercial aircraft crash is still considered a hazard in may Member States and therefore the hazard is assessed base on traffic and proximity of airports runways. The aircraft crash hazard is part of siting and site evaluation as per NS-R-3 and NS-G-3.1.
2	3.19	Ranking criteria are necessary to provide bases for comparison among the candidate sites to arrive at a list of preferred sites. For safety related issues, comparison within topics is		Ranking criteria may also include commercial considerations (for example land ownership or proximity of other facilities) and may not always be necessary for site selection on safety			x	We acknowledge that ranking criteria combines both safety and non-safety aspects. However the

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Comment No.	Para/ Line No.	IAEA text :	Proposed new text :	Reason :	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		generally quite straightforward. For example, sites with relatively higher seismic hazard would be penalized in comparison with those in more stable areas. What is more difficult is comparison across the topics, in other words comparing a site with higher seismic hazard but lower flood hazard with another site having the opposite characteristics. There are various ways of dealing with this type of situation as illustrated in Annex III.		grounds. It may be sufficient for a national process to identify candidate sites, and allow market mechanisms to drive the selection of preferred sites.				ranking is a process used to select the most favorable site from the list of more candidates. For example ranking process helps to choose the most favorable site between: 1) a site with relative high seismic hazard and low flood hazard 2) a site with relative high flood hazard and low seismic hazard and 3) a site with moderate seismic and flood hazards. Note that all candidate sites that are considered in the ranking are considered suitable sites (remaining after exclusion criteria have been

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								applied)
3	4.9	Following criteria should be considered to site a nuclear installation in a location from the consideration of protection against sabotage. (a) A site of nuclear installation should not be located near to any area or facility with high potential threat. (b) It is preferable to locate a site not having clear view of sight from all directions (e.g. tip of a peninsula). (c) The access to the site should be restricted to a minimum number required for safety and operation considerations. (d) Site characteristics should be such that ultimate heat sink could not be easily accessed. (e) The site should be away from the population center and public transport route.		This document must not deal with requirements for protection against sabotage, but rather include a requirement for an assessment, in consultation with regulatory authorities responsible for assuring security of nuclear installations, of the suitability of specific sites with reference to perceived levels of threat. It has to be made explicit that security considerations, while discretionary, may result in compelling arguments to exclude certain sites.			x	The intend of these criteria is to observe early in the selection process security aspects (in consultation with competent authorities) to avoid exclusion based on security reasons later on in detailed evaluation process. Is not intended to provide guidelines or requirements for protection against sabotage or other security threats. Also security section from IAEA was consulted.
4	5.4	The analyses performed based on the collected data should consider the total lifetime of the nuclear installation. Appropriate projections should be made especially in relation to		Reference should be made to consideration of whether the site can be adapted for the effects of climate change over the lifetime of the plant, rather than aiming to forecast what changes may occur over very		X		Reference to DS417 was introduced. 5.4 deals with data collection and is in line with DS417 that have

COMMENTS BY REVIEWER Reviewer: Jean-Pierre Berger / Gerd Bassing Country/Organization: ENISS			Nb. of Pages: 6 Date: 10 June 2011		RESOLUTION Date: 2011-08-15			
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		parameters that may show significant variation with time. Data that may change more slowly should also be considered. In this context the potential impact of global warming to site related hazards should be considered especially in terms of the possibility of increased rate and intensity of extreme meteorological and hydrological phenomena.		long periods into the future.				been endorsed by WMO. To adapt the site to the climate change we should observe what could be the effects of the climate change and how these may challenge the plant safety.
5	5.8	The following databases should be established for the siting process and is further elaborated in Appendix-A: (a) Geological database (b) Seismological database (c) Fault displacement database (d) Volcanological database (e) Coastal flooding database (f) River flooding database (g) Meteorological extreme events database (h) Human induced events database (i) Population and environmental aspects		It could be important to describe that only data relevant for the particular area should be established.			x	At initial stage of site survey data is collected as regional scale to support identification of the potential sites and the screening process. Only available data from various sources is used (no specific investigation is conducted at this stage)
6	Appendix A point 24	Flooding from Tsunami: Tsunami hazard arises because of the effects of earthquakes, volcanic activity or landslides on the ocean floor. Relevant data should be		Flooding from Tsunami. In the light of Fukushima this point should deserve more attention, should also be related to point 13 of table II-1			x	More attention for Tsunami hazard assessment in light to Fukushima

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		collected from national authorities if this is available. There may also be historical records of large scale flooding in the region that can be associated with one of the initiators above. The Safety Guide [8] provides simple screening criteria that can be employed that need only minimal data. If the proposed site does not satisfy the conditions for applying the screening criteria in [8], then a situation may exist where there is too little reliable data upon which a simple desktop study can be made, and consideration of this issue should be carried to the next stage.						accident should be in Evaluation Stage (out of scope of this SG).
7	Table II-1			The point 13 seems too extreme, in particular a height of 50 meters above mean water level seems unjustified.			x	It is a screening criteria not a requirement or recommendation (screening is always conservative)
8	II.24	Radiological impact assessment Minimum area to be covered from the center of reactor for radiological impact assessment for design basis accidents is: 1) For exposure pathway :		The suggested radius of the areas to be investigated for exposure pathways and for ingestion pathways are direct-ly derived from the NRC crite-ria for Emergency planning as established in 1980 right after TMI. Since a new site should			x	Annex II shows examples and practice from different MS. Annex does not contain requirements or guidelines. Also

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		16km 2) For ingestion pathway : 80km		be necessary for a new installation this criterion should be related to the technology that is supposed to be used.				for site selection purpose conservative distances can be used (such values are not compulsory – this is why they are presented in annex)
9	Annex III			The proposed ranking methodology seems difficult to apply since no one would have the required data on plant costs differentials at a siting stage.			x	There is no requirement Annex III (is not part of the guidelines) presents only an illustrative example of ranking process.

Comments Resolution: Safety Aspects in Siting for Nuclear Installation, DS433 (2011-04-19)

COMMENTS BY REVIEWER Reviewer: S. Maki Page 1 of Country/Organization: Japan/ NISA Date: 7 June 2011				RESOLUTION Date August 15, 211			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
1	General	Refinement and additional explanations throughout the draft.	In the draft, many editorial mistakes and lacks of explanations and un-matured sentences are found. Re-drafting may be required.			x	Comments of general type; editorial correction will be made; final version will be edited by IEAEA English editor.
2	General	Add clear reason and evidence for numerical values shown in the entire draft including Appendix and Annex.	Especially many affecting numerical values are described in Annex II although it says they are examples but we are afraid to cause misleading. These numerical values are required to describe their sources, meanings and limitations.			x	No numerical values are given in the main text or appendix; these are in Annex only. Source of the numerical values will be referred to.
3	General	Importance of periodic review of the hazardous phenomena should be described in Section 2.	External hazard phenomena tend to change by time, the importance of periodic review of the hazardous phenomena should be described.			x	For siting, periodic review of hazardous phenomena is not necessary.

4	General	It is necessary to clarify the scope of this guide in the preface or scope section.	As for DS433, being thought the guide for Siting (Site evaluation is not included). But matters relating evaluation phase are also described (eg. Fig. I and II). We suppose these descriptions are necessary but it will cause confusion.			x	Detailed scope of the guide is given in 1.10 – 1.15 of 'SCOPE'.
5	General	Scope of this guide relating human relating hazards (i.e. Sabotage and other unintentional human related events).	"Intentional human relating hazards are out of this guide" This is our understanding but in this thought, is sabotage intentional one?				
6	2.5/7	All the site related activities after the approval of the SER by the regulatory authority and which involve confirmatory and monitoring work are in the pre-operational stage. → All the site related activities which involve confirmatory and monitoring work after the approval of the SER by the regulatory authority are in the pre-operational stage.	Correction			x	Proposed correction will change the basic intent of the provisions
7	Figure 2	SITING PROCESS → SITING SITING EVALUATION → SITE EVALUATION	Consistency with Figure 1	x			

8	3.3/12	Change wards as follows; /"The first stage" to "SITE SURVEY STAGE" /"second stage of siting" to "SITE SELECTION STAGE"	Correct obscurity words			x	Comment is not understood.
9	3.4/3 3.5/2	preferred sites → preferred candidate sites	Consistency with Figure 3			x	Change of terminology will redefine the siting process
10	3.18 /1	"…cited in Ref-1 <u>from</u> the primary source …."	Relation between "Ref-1" and "the primary source" is not clear. "from" may be "as"? If this section is made not only as a brief excerpt of Ref-1 but also including other idea than Ref-1, this difference should be clearly indicated.	x			The word 'from' is replaced by 'as'.
11	3.18.1/4	"as low as reasonably achievable" ➔"as low as reasonably achievable (ALARA)"	In Abbreviation list of this Guide the term ALARA appears. So, the term ALARA should be used here.	x			

12	4.4.(f)	Combination of coastal and river flooding (in estuaries, e.g.), flash floods due to intense precipitation~~ or downburst~~	Why combination with down- burst? Downburst is normally as a phenomenon of very strong wind. If this sentence means "combination of flooding with heavy rain associated downburst", is the word of "intense precipitation" sufficient?			x	Present text is in line with DS417
13	4.9 (b) and (e)	(b) It is preferable to locate a site not having clear view of sight from all directions (e.g. tip of a peninsula). (e) The site should be away from the population center and public transport route.	The explanations of (b) and (e) are required to clarify these requests in relation with sabotage.			x	The explanation as sought will be included in safety report that would be prepared under the tasks of WA-8 of ISSC-EBP
14	5.4/4	In this context the potential impact of global warming to site related hazards should be considered especially in terms of the possibility of increased rate and intensity of extreme meteorological and hydrological phenomena. →Data of these kind slowly varying phenomena should be reviewed in the Periodic Review and should be reflected to evaluation.	Prediction for effect by global warming has considerable uncertainness.			x	For siting, periodic review of any phenomena is not necessary.

15	6.3/9-10	Consider adding more explanation for "the conventional context" for the clarification purpose.	Not very clear what "the conventional context" means.				
16	7./0 (and Contents page)	**MANAGEMENT SYSTEMS AND QUALITY ASSURANCE REQUIREMENTS** → **MANAGEMENT SYSTEMS AND QUALITY MANAGEMENT REQUIREMENTS**	Fit to GS-R-3	x			
17	7.1/1 and others (1.16/7, 7.2/1, 7.3/1, 7.3/2, 7.3/4, 7.8/2, 7.17/3)	quality assurance program→quality management program	Fit to GS-R-3	x			
18	Appendix-A 19/6	"bunds"➔"sea wall"	"bunds" is not a familiar word. "Sea wall" is used in coastal engineering and appropriate to use.	x			
19	Appendix – A 3	The size of the relevant region to be studied ~~– is typically 100 - 300 km and~~ depends on the length of the regional faults.	Delete the values. If not, add clear reason and evidence for these values.			x	Reference will be added
20	Appendix-A8/5	should be collected, extending as far back in time as possible. →as far back in time as practically possible	Some limitation is needed for the investigation time.			x	Adding of word 'Practically' is superfluous.

21	Appendix-A32/4	SSC(s): Should be explained in the abbreviation.		x			
22	Annex I TABLE I-1	Abbreviated word which comes first should be explained in footnote: EM interference	"EM interference" comes first here.	x			
23	ANNEX II	General	Although this annex is explained as example, numerical values with a large influence such as screening values and exceedance probabilities are listed in this annex, and it is easy to give a false impression or mis-leading. It is recommended that the source, reasoning and meaning of the value should be described together with values. Or numerical values may be recommended to be deleted.			x	Reference will be addred
24	ANNEX-Ⅱ Ⅱ.7.1 iv)	Broadcasting and communication networks (for electromagnetic interfering hazard)	The meaning of underlined portion looks require explanation			x	In line with NS-G-3.1
25	ANNEX-Ⅱ Ⅱ.10 1. ii)	i) Contour maps for the region up to 30 km →Contour maps for the region ~~up to 30 km~~	Numerical number is written only in this term. This number may change by wind speed, direction etc. Number should be deleted to prevent misleading.			x	Reference will be added

26	ANNEX II.10.4.ii)/1	Power evacuation scheme →This words are unfamiliar, should be explained				x	Commonly used terminology for transmitting electric power from generating station to the user ends through distribution system.
27	Annex II.11 (General comment on II.11 and Table II-1)	Please clarify how to read II.11/3-4 and “Exclusion” in Table II-1		x			
28	Annex II Table II-1/3	Screening Value for Capable Fault:8km and Description in Remarks: Exclusion	Source, reasoning and background of 8km should be explained, or it will be recommended to delete numerical value.			x	Source of USNRC-RG 4.7 is quoted as reference.
29	TableII-1 Example of Screening Values Volcano	Volcano is missing from the table. Additional note may be required on the table “Some phenomena such as volcano are not listed in the table but will be required in the volcano-genic potential site.				x	There is no SDV for volcanic hazards.

30	TableII-1 Example of Screening Values for Tsunami	Explanation of source and meaning of tsunami screening values should be noted.	Screening values shown here (10km and 50m) are explained in DS417 and it says that these values are for easy evaluation in very beginning phase of evaluation to screen out tsunami study. So these values may have very big margin. This kind thing should be noted with the values.			x	Source would be referred
31	ANNEX- Ⅱ Ⅱ .16/2	'wind speed'⇒'wind speed and direction'		x			
32	Annex Ⅱ / Ⅱ .24	Minimum area to be covered from the center of reactor for radiological impact assessment for design basis accidents is: 1) For exposure pathway : 16km 2) For ingestion pathway : 80km	Source, background and meaning of these values should be explained, or should be deleted.			x	Source would be reffered
33	ANNEX II.25.3).ii)	Meaning of IL and DIL should be footnoted	For easy understanding			x	The mentioned words could not be traced in the referred portioned..

Comments Resolution: TITLE: DS433 "Safety Aspects in Siting for Nuclear Installations"

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: **PNRA** Page... 01 of 01 Country/Organization: **Pakistan** Date: 30-05-2011				Date: 2011-08-15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	Sub Section 3.3	Necessary details for regional analysis like scope, objective, area etc., may also be incorporated in the draft guide.	Regional analysis is the first step in siting process & its scope, objective, area atc. needs to be clearly described.			x	Details are available in Safety Guides on site evaluation
2.	Sub Section 3.3	In this subsection it is mentioned that "*It is important to consider all the potential sites in this phase and not to discard any*" which is in contrast to figure 3.	In the said statement all the potential sites are considered and nothing is rejected during the regional analysis phase but in figure 3 it is not the case.	x			Regions with very obvious unfavorable technical characteristics and included in Government's future land use plan are only eliminated. 'without appropriate justification' is added after 'discard any'
3.	Sub Section 5.8	Geotechnical database may also be included in database necessary at different stages of siting process.	Geotechnical data is very important for siting and design & may be considered during all the stages of siting.	x			Already included in App. A. Missed in sect 5.8 and included.
4.	Table I-1	In table I-1 regarding screening and ranking criteria for site selection, the criteria "earthquake" may be replaced with "seismicity" and similarly type may be "low seismicity" and "high seismicity".	Seismicity is a broad term and it covers earthquake as well.			x	Earthquake is the phenomena and produces several effects, ground ruptures, ground motions, etc
5.	General Comment	Regulatory oversight at siting may be addressed & other relevant standards such as SSG-12 may also be referred in the guide.	Role of regulatory body at different stages may be described along with regulatory authorization process.			x	Site selection is an unregulated stage.

6.	General Comment	Other relevant IAEA safety standards such as NS-G-3.1, NS-G-3.2, SSG-9 may be referred.	To provide linkage among various safety standards and to guide the users to more detailed standards.			x	All siting documents are included in the reference and referred in App. A and Annex 1.

Comments Resolution: "Safety Aspects in Siting for Nuclear Installations" DS 433

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Country/Organization: Ukraine/SSTC NRS			Page 1 of 8 Date: 01.06.11	Date: 2011-08-15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	General	The document does not take into account the events at the Fukushima NPP; in particular, greater attention should be paid to a combination of different external events that may lead to severe consequences.				x	It describes the site selection process and the important factors that should be considered from the beginning of the site selection process in order to arrive eventually at a suitable site and not lose a potential site at an

							advanced stage. The combination of external events is considered at a later stage.
2.	3.18 (9). Potential natural and human induced events that could cause a loss of function of systems required for the long term removal of heat from the core should be identified, such as the blockage or diversion of a river, the depletion of a reservoir, an excessive amount of marine organisms, the blockage of a reservoir or cooling tower by freezing or the formation of ice, ship collisions, oil spills and fires.	3.18 (9). Potential natural and human induced events that could cause a loss of function of systems required for the long term removal of heat from the core, loss of reactivity control, and failure of safety barriers should be identified, such as the blockage or diversion of a river, the depletion of a reservoir, an excessive amount of marine organisms, the blockage of a reservoir or cooling tower by freezing or the formation of ice, ship collisions, oil spills and fires, earthquakes and external floods.	1. Natural events associated with external flooding and earthquakes (by the example of the Fukushima accident) should also be indicated. 2. Requirements for assessing candidate sites should also take into account the loss of two other safety functions: reactivity control and confinement of radioactive material within design boundaries (safety barriers).			x	The statements at 3.18 are taken from NS-R-3 and cannot be modified. The recommended factors for inclusion are not considered during the site selection stage but at a much later

							stage.
3.	5.13. Since the data on many external hazards is likely to be limited and of variable quality, it is anticipated that some quantitative analyses will be required	Add «..quantitative **deterministic** analysis **with a conservative approach**» to account for unlikely events with severe consequences.	In order to learn lessons from the Fukushima accident.			x	IAEA guides do not recommend one approach but both, depending on a case to case basis
4.	II.10 Aspects not directly related to radiological safety 4. Availability of power supply and transmission lines	Add analysis of power supply sources independent of a nuclear installation to consider their possible use in case of total loss of power	Possible external power supply sources should be considered in the siting process to ensure further efficient planning of emergency actions		x added power supply sources		
5.	Section 2. Para. 2.1	The original text: "The framework for the **site survey** and site evaluation **stages** is elaborated…" The proposed text: "The framework for the **siting** and site evaluation **processes** is elaborated…"	The Guide many times mentions two processes: "siting" and "site evaluation". "Site survey" is a stage of the "siting" process.			x	The original text is clear and elaborate.
6.	Section 2. Para. 2.5	It would be reasonable to provide brief information in the Guide on the SER structure and contents and give references to other IAEA documents where these aspects are treated in more detail.	The document "**Site Evaluation Report**" (SER) is referred to in this paragraph for the first time and then is mentioned several times further in the Guide and so seems to be quite an important document.			x	SER is a well known document and providing its contents in this

							subsection is not appropriate.
7.	Section 2. Para. 2.7	The original text: "There are three important steps that will receive input from the **site survey, site selection and the site evaluation process…**" The proposed text: "There are three important steps that will receive input from the **siting and the site evaluation processes…**"	Similarly to the above comment (see comment 1), there is confusion between the processes and stages of these processes.			x	The original text is clear.
8.	App. A , 31 (a)	Regional and local history of extreme values of meteorological parameters – both extreme highs and extreme lows of: Temperature, humidity, atmospheric pressure, wind speed, precipitation, icing, ice-storm, sandy storms etc. Similar regional and local data on rare meteorological events, such as tornado, cyclone, lightening should be collected	icing, ice-storm, sandy storms are hazardous meteorological phenomena that may indirectly lead to severe undesirable external events.	x			
9.	To the document as a whole	As mentioned in para 1.14 “the Safety Guide addresses an extended range of nuclear installations…”. Thus, all requirements in following chapters (from chapter 2 to chapter 5) relate to all these installations. At the same		x			

		time Chapter 6 deals with "Site survey and site selection for nuclear installations other than nuclear power plant". It is necessary either to mention that requirements of Chapters 2-5 just refer to a nuclear power plant or clarify which of the requirements are not applicable to installations other than a nuclear power plant.					
10.	Para 1.13, add a new phrase after the last one	This Safety Guide could be used for reassessment of existing sites with operating installations to establish whether the site corresponds to safety requirements listed in NS-R-3	For completeness			x	Site assessments/reassessments are done using NS-R-3 during the detailed evaluation stage. Safety requirements of NS-R-3 are however reproduced in this SG.
11.	Para 3.17 Add a new phrase	Possible time-induced changes in attributes of potential and candidate sites should be assessed for the entire lifetime of nuclear installations in question.	To ensure that a proper site investigation programme which addresses all safety related aspects is further established			x	Data collection includes time-

							induced changes.
12.	Para 3.22, Second phrase	The term “reference site” is not mentioned in previous text of the document. It should be clarified or reference should be added.	For clarification	x			It is just an example to demonstrate cost differential of candidate sites wrt a reference site with some average parameters(seismic value, height wrt msl)
13.	Para 3.25, lines 2-3	… when sites that have been selected in the context of an earlier nuclear installation project and are to be re-assessed to confirm up-to-date safety requirements or that have been discontinued…	To include operating nuclear installations at existing sites	x			
14.	Para 3.26, (b)	…, e.g. power reactor, nuclear spent fuel storage, facilities for radwaste management,….	Radwaste management facilities should be mentioned especially if very low level waste is disposed of in the repositories at the same site with other nuclear			x	Radwaste management facilities are not

			installations as it could lead to hazards arising from accidental events.				credible sources to produce serious hazards
15.	Para 4.5, (a), item (i)	Add – "hydraulic engineering structures"		x			
16.	Para 4.6, (e)	Delete	As not related to the site characteristics			x	It is a lesson learnt from Fukushima accident
17.	Para 6.3, lines 5 -6	…would be likely for workers and for the public … (… that doses to workers and to the public…)	Acceptability of a site should be assessed in terms of doses to workers as well as to the public depending on consequences of releases			x	Assessment of doses to workers is out of scope of the site selection stage/ document
18.	Para 7.2, add a new bullet after the first one	… • Identification of required means to provide for quality assurance during activities for site selection				x	It discusses implementation as per IAEA QA documen

							ts and does not provide means.
19.	4.4	This paragraph shows a list of natural phenomena that may jeopardize the safety of a nuclear installation (NI) and are recommended for consideration in siting for NI. It is recommended that the list in para. 4.4 be supplemented with «Low water levels» (abnormal decrease of level in water bodies (firs of all, rivers) used for service water supply to NPP, for example, for makeup of the essential cooling system) and «Icing» (which is hazardous, for example, for extensive transmission lines and may lead to the initiating event such as loss of power supply).	The first phenomenon is mentioned in para. 28 of Appendix A to DS 433 (“Low river levels”) and the other is missing in draft Guide DS 433.			x	Low water levels in rivers is studied during the collection of historical data (database development). Effects of icing on transmission lines is not safety issue.
20.	Appendix A, para. «Geological Database»	This paragraph of Appendix A indicates that the relevant detailed information is provided in draft IAEA Guide DS417 “Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations”. It is also recommended to make reference to the IAEA document SSG-9 «Seismic Hazards in Site Evaluation		x			

		for Nuclear Installations», which contains more specific information on a geological database.					
21.	Appendix A, para. «Seismological Database»	This paragraph of Appendix A has no reference to an IAEA document with more specific and detailed information on a seismological database for NPP. It is recommended to indicate in the paragraph «Seismological Database» that the relevant detailed requirements are provided in IAEA document SSG-9 (by analogy with other paragraphs of Appendix A)		x			
22.	Appendix A, para. «Database Geotechnical Hazards»	This paragraph of Appendix A indicates that the relevant detailed information is provided in draft IAEA Guide DS416 “Licensing Process for Nuclear Installations ”. It is recommended that this reference by replaced by reference by IAEA document NS-G-3.6 “Geotechnical Aspects of Site Evaluation and Foundations for NPPs” or SSG-9, which will be more appropriate and correct.		x			
23.	Appendix A, paragraph «Database on Coastal Flooding»	This paragraph of Appendix A refers to IAEA document NS-G-3.6 “Geotechnical Aspects of Site Evaluation and Foundations for NPPs” and indicates that this document contains data on tsunami that may be useful in developing a database for the site. It is recommended that this reference by replaced by reference to draft IAEA		x			

		Guide DS417 “Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations”, which contains more extensive information on tsunami that can be useful in developing a database.					
24.	Appendix A, paragraph «Database on River Flooding»	This paragraph of Appendix A refers to IAEA document NS-G-3.6 “Geotechnical Aspects of Site Evaluation and Foundations for NPPs”. It is recommended that this reference by replaced by reference to draft IAEA Guide DS417 “Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations”, which is more appropriate to the context.		x			
25.	Appendix A, Table I-2	Table I-2 «Site selection issues cross reference to safety standards» indicates IAEA documents that contain information on various natural and man-induced events, which can be useful in siting for NI. This table correctly refers to IAEA document NS-G-1.5 “External Events Excluding Earthquakes in the Design of Nuclear Power Plants Safety Guide” in the context of data on flooding, extreme natural phenomena, and man-induced events, but there are no references to this document either in the text of Guide DS433 (in particular, in Appendix A) or in the list of references. It is recommended to add				x	Design documents have not been mentioned in the reference.

		the relevant references to Guide DS433.					
26.	Para 4.4	The list of natural hazards considered within the first set of safety criteria should be extended with "- combinations of natural hazards (e.g. earthquake and tsunami)"	Lesson learnt from the Fukushima accident	x			
27.	Para 4.7	The list of site characteristics related to implementation of protective measures considered within the forth criteria should be extended with "- physical and infrastructure site characteristics related to the potential transfer of mobile safety equipment (e.g., electric power supply) to the site in case of an accident"	Lesson learnt from the Fukushima accident			x	Not relevant as para 4.7 is related to the demonstration of the feasibility of emergency plan

Comments Resolution: WNA/CORDEL Comments on: DS433 – Safety Aspects in Siting for Nuclear Installations
DS433 Draft 00.08, Date: 2011-05-02

COMMENTS BY REVIEWER		RESOLUTION
Reviewer: contact: Irina Borysova [borysova@world-nuclear.org]	Page 1 of 15	
Country/Organization: WNA/CORDEL	Date:	Date: 2011-08-15

Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
General		It seems to be recommendable to revise at first the Safety Requirements, NS-R-3, before this Guide will be finished. Main reasons are: - NS-R-3 does not cover the initial stage of the siting process, i.e. the site survey, and the safety-related decision aspects, however, a related Safety Guide should in principle not exceed the regulation range of the higher level standards, - according to SPESS recommendations NS-R-3 requirements could be updated, completed and formatted in the new layout of requirements so that appropriate references can be made in the subsequent Safety Guides building a logical relationship, which is missed in DS 433.					
General		It is suggested to introduce in DS 433 related references to other existing safety guides in certain paragraphs and so to avoid repetitions as far as possible. DS 433 right now contains a lot of information already included in other (siting related) standards. However, an optimized adaption in this way would increase the maturity for discussion between member states.					
General		It seems to be not appropriate to recommend cost decision instruments in a Safety Guide. The content of Annex III is not necessary for safety reviews or license application or any other oversight processes and should be deleted therefore.					
1	1.3/3	I suggest rewriting the sentence that starts with “Even…” as follows for	To make the sentence	x			

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		clarity: "The outcome of this task may even affect the final success of the program."	clearer				
2	1.3/9	Change "…related design parameters is changed…" to "…related design parameters are changed…"	This is grammatically correct.	x			
3	1.8/5	Change "The Safety Guide also has the objective providing…" to "The Safety Guide also has the objective of providing…"	This is grammatically correct.	x			
4	1.13/1 &2	Change "…for the siting of new nuclear installation at new site and provides…" to "…for the siting of a new nuclear installation at a new site and provides…"	This is grammatically correct.	x			
5	1.14/2	This Safety Guide addresses an extended range of nuclear installations as defined in Ref. ~~[3]~~[1]:....	Not clear that this sentence is referring to the correct reference. The reference should be the higher level document, as Ref. [1] instead of [3].	x			
6	1.16/6	Please change "…providing a grading approach…" to "providing a graded approach…"	This is grammatically correct.	x			
7	1.16/8	Please change "…to be used in siting process…" to "…to be used in	This is grammatically correct.	x			

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		the siting process…"					
8	1.16/9	Please change "…example of criteria for siting process…" to "…example of criteria for the siting process…"	This is grammatically correct.	x			
9	1.16/10	Please change "…Annex III provides example of procedure…" to "…Annex III provides an example of a procedure…"	This is grammatically correct.	x			
10	2.3/1	Change "…consistsof…" to "…consists of…"	Space is missing	x			
11	2.3/2	Sentence should read "In the site survey stage, large regions are…"	This is grammatically correct and a space is missing.	x			
12	2.5/4	Please insert "the" in the statement "…derivation of the design basis…"	This is grammatically correct.	x			
13	2.5/13	Please change "…(PSR) report…" to "…(PSR) reports…"	Periodic implies multiple reports	x			
14	3.3 (3)/1	Please change "…third step twofold:…" to "…third step is twofold:…"	This is grammatically correct.	x			
15	3.4/2	Please change "…may emerge during site assessment…" to "…may emerge during the site assessment…"	This is grammatically correct.	x			
16	3.4/3	Please change "To accommodate such situation…" to "To accommodate such a situation…"	This is grammatically correct.	x			
17	3.4/5	Please change "…safety issues that is discovered…" to "…safety issues that are discovered…"	This is the correct verb conjugation for this sentence.	x			

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18	3.5/3	Please change "…input from the all the stake holder." To "…input from ~~the~~ all the stake holder."	"the" is unnecessary here and redundant.	x			
19	3.6/1	I suggest rewriting this first sentence for clarity as follows: "Siting criteria are the bases (or the principles) by which decisions are made on the site attributes during the different steps of the siting process. Siting criteria are used to evaluate site related specific issues, events, phenomena, hazards and other considerations after the site has been investigated and analyzed."	To clarify the requirement and to breakup a run on sentence.	x			
20	3.7/2	I suggest rewriting the second sentence for clarification as follows: "Regional criteria are generally related to national domestic policy, national economic policy or other related policies of the member state."	For clarity	x			
21	3.7/4	Please change "…and availability of water on regional…" to "…and the availability of water on a regional…"	This is grammatically correct.	x			
22	3.7/5	Please change "Important aspect…" to "The important aspect…."	This is grammatically correct.	x			
23	3.7/6	Please change "…potential site.." to "…potential sites.."	This is grammatically correct.	x			

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24	3.8/ first bullet-1	Please change "Exclusion criteria: the exclusion criteria discard sites…" to "Exclusion criteria: the exclusion criteria is used to discard sites…"	The font size on "the" is to small and the verb is missing from the sentence.	x			
25	3.8/first bullet-ln 2	Please change "…events or phenomena or hazard…" to "…events or phenomena or hazards…"	Events or phenomena are plural…	x			
26	3.8/first bullet-ln 3	Please change "…engineering solution are not generally practicable." To "…engineering solutions are not generally practicable."	This is grammatically correct.	x			
27	3.8/2nd bullet-ln 2	Please change "…or phenomena or hazards,…" to "…or phenomena, or hazards,…"	Comma is missing	x			
28	3.10/1	I suggest rewriting this sentence for clarity as follows: "The screening and ranking criteria consist of both safety related criteria as well as non-safety-related criteria."	For clarity	x			
29	3.18/1-9	1 In relation to the characteristics and distribution of the population, the combined effects of the site and the installation ~~should~~ shall be such that: 2 Before construction of the installation is started, it ~~should~~ shall be confirmed that there will be no insurmountable difficulties....	What are the reasons to convert the "shall" formulations into "should" formulations in the sentences of para. 1-9? The cited requirements of Ref. 1 have to be checked and corrected.	x			

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		3...					
30	3.18/2	Break this sentence as follows for clarity: "...criteria to the siting process. The site safety requirements are elaborated below:"	For clarity	x			
31	3.18/3	Please change "(Following paragraphs,1-9, are excerpt from reference - 1 will be edited as per IAEA standard practice)" to "(Following paragraphs,1-9, are excerpt from reference - 1 ~~will be edited as per IAEA standard practice~~)"	This statement does not belong in a specification.	x			
32	4.2/2	Please verify "IAEA NS-R-3 [2]" I think this is the wrong reference...IAEA NS-R-3 is reference [1].	To correct note to wrong reference	x			
33	4.9(a)/1	This criteria needs to be amplified further. What type of potential threat are you referring to and what are examples of the areas and facilities ?	Requirement amplification			x	Threat potentials vary from country to country
34	4.9(b)/1	I suggest rewording this criteria as follows for clarity (if this is the intent of the criteria: "It is preferable to locate the site with a clear view in all directions (e.g. tip of a peninsula).	I am not sure this requirement makes sense or is correct. To ensure plant security, clear view in all directions is desirable.	x			The example was not correct and therefore deleted

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35	4.9(c)/2	Please change "…and operation considerations." to "…and operational considerations.	This is grammatically correct.	x			
36	4.9(d)/1	Reword this criteria for clarity as follows: "...that the ultimate heat sink is not readily accessible to unauthorized personnel."	For clarity	x			
37	4.9(e)/1	Please clarify this criteria as follows: "...from population centers and public transportation routes."	For clarity	x			
38	4.10	Please change "Criteria related to protection against sabotage to be used in siting process are generally discretionary type and is also used for ranking purpose." to "The criteria related to protection against sabotage ~~to be~~ used in the siting process are generally discretionary ~~type~~ and ~~is~~ are also used for ranking purposes."	This is grammatically correct.	x			
39	5.1/2	Please change "…imageries, topo sheets,…" to "…imageries, topographic sheets,…"	For clarity	x			
40	5.1/3	Please change "…authority and other institution." to "…authorities and other institutions."	This is grammatically correct.	x			
41	5.3/3	Please change "…specific steps of siting process…" to "…specific steps of the siting process…"	This is grammatically correct.	x			
42	5.5/1	Please change "…site survey and	This is grammatically	x			

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		site…" to "…site surveys and site…"	correct.				
43	5.12/1	Please change "To enable to undertake the activities of second stage,..." to "To enable ~~to undertake the~~ activities of the second stage,..."	This is grammatically correct.	x			
44	6.1/1	Please reword the criteria as follows: "~~In consideration of the use of a~~ The graded…"	The delete wording adds nothing to the requirement.	x			
45	6.9/2	Please change "Furthermore, the depending on the consequences…" to "Furthermore, ~~the~~ depending on the consequences…"	"the" is not necessary for understanding.	x			
46	6.9/3	Please add a comma as follows: "…criteria, the protection feasibility and…"	Comma was missing	x			
47	6.9/5	Please change "…of resources are not expended for this…" to "…of resources are ~~not~~ expended for this…"	"not" is grammatically incorrect and leads to a double negative…	x			
48	7.1/1	Please change "…the management system, quality assurance program…" to "…the management system, the quality assurance program…"	This is grammatically correct.	x			
49	7.3/1	Please change "…quality assurance program for siting…" to "…quality assurance program for the siting…"	This is grammatically correct.	x			

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50	7.8(a)/1	Please change "…from the activities of siting…" to "…from the activities of the siting…"	This is grammatically correct.	x			
51	7.8(c)/1	Please change "…activities of siting process,…" to "…activities of the siting process,…"	This is grammatically correct.	x			
52	7.9/2	Please change "…execution of siting project,…" to change "…execution of the siting project,…"	This is grammatically correct.	x			
53	7.9/3	Please change "…total power generation of NPP…" to "…total power generation of the NPP…"	This is grammatically correct.	x			
54	7.10/3	Please confirm Refs [13, 14] are the correct references	Shouldn't these references be [12, 13]? 14 is the IAEA Safety Glossary.	x			
55	7.11/1	Please change "…activities during site survey…" to "…activities during the site survey…"	This is grammatically correct.	x			
56	Appendix A	Check references in this Appendix	Please double check that all references in this Appendix are pointing to the correct reference. I have found several errors.	x			
57	App A 9./4	Please verify reference to Safety Guide [6] is correct.	Shouldn't this reference by [5] - Seismic Hazards in Site Evaluation for Nuclear Installations?	x			
58	App A 17/12	Please verify reference to Safety Guide [10] is correct.	This should be reference [8] - Geotechnical aspects	x			

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			of site evaluation and foundations for Nuclear Power Plants				
59	App A 24/5	Please verify reference to Safety Guide [8] is correct.	I think this reference should be to safety guide [6].	x			
60	App A 24/7	Please verify reference to Safety Guide [8] is correct.	I think this reference should be to safety guide [6].	x			
61	Table I-1	Please make the marks within the table consistent.	The marks within the table need to be consistent. I would use "X" since there is a mixtures of checks "√" & square roots now.	x			
62	Table I-2	Line up table columns.	Table headings do not line up and need to be cleaned up. It is not clear which heading goes with which column.	x			
63	Annex II; II.1/2	Please change "…examples on attributes and related criteria to be considered in siting…" to "…examples ~~on~~ of attributes and related criteria to be considered in the siting…"	This is grammatically correct.	x			
64	Annex II; II.2/1	Please change "…is prepared compiling…" to "…is prepared by compiling…"	This is grammatically correct.	x			

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65	Annex II; II.2/2	Please change "Provisions given in…" to "~~Provisions~~ Examples are given in…"	This is grammatically correct.	x			
66	Annex II; II.2/3, 4	Please revise "…on the events of accidental origin and / or natural phenomena envelope, in some case, the external human induced events of sabotage." to ""...of accidents and/or natural phenomena, including external human events of sabotage."	For clarity	x			
67	Annex II; II.3/2	Please change "…related to siting process in addition to general information on site" to "…related to the siting process in addition to general information on the site."	This is grammatically correct.	x			
68	Annex II; II.3/2nd bullet	Please change "External human-induced" to "External human-induced events"	For clarity	x			
69	Annex II; II.3/10	Please revise "…bearing on effective siting process." to "...on the effectiveness of the siting process."	For clarity and proper grammar	x			
70	Annex II; II.4/1	Please change "…providing examples on issues,…" to "…providing examples ~~on~~ of issues,…"	This is grammatically correct.	x			
71	Annex II; II.4/6	Please change "Example of discretionary…" to "Examples of discretionary…	This is grammatically correct.	x			

Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
72	Annex II; II.4/7	Please change "…provides example on content…" to "…provides example ~~on~~ of content…"	This is grammatically correct.	x			
73	Annex II; II.4/8	Please change "…emergency procedure, which would serve as useful information for examination of feasibility…" to "…emergency procedures, which would serve as useful information for examination of the feasibility…"	This is grammatically correct.	x			
74	Annex II; II.11/2	Please change "…during site survey stage. Examples of some of such screening…" to "…during the site survey stage. Examples of ~~some of~~ such screening…"	This is grammatically correct.	x			
75	Annex II; II.11/3	Please change "…satisfy any one or combination…." To "…satisfy any one or a combination…"	This is grammatically correct.	x			
76	Annex II; II.11/4	Please revise "…provided solution by means of engineering measure,…" to "...providing an engineering solution is found to satisfy the screening criteria."	This is grammatically correct.	x			
77	Annex II; Table II-1/item (8)	Replace "inflammable" with "flammable"	The screening criteria should be on "flammable material"	x			
78	Annex II; II.12/1	Please change "The second stage of siting process is site selection stage, which involves with…" to "The second stage of the siting process is	This is grammatically correct.	x			

Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		the site selection stage, which involves ~~with~~ a…"					
79	Annex II; II.12/2	Please change "Example of criteria for the site evaluation needed in this stage is…" to "Examples of criteria for the site evaluation needed ~~in~~ at this stage ~~is~~ are…"	This is grammatically correct.	x			
80	Annex II; II.12/3	Please change "criteria are of discretionary type and can also be used for ranking purpose." to "criteria are of the discretionary type and can also be used for ranking purposes."	This is grammatically correct.	x			
81	Annex II; II.13/4	Please revise "…without taking any account for taking any emergency counter measures in public domain." to ""...taking into account public emergency counter measures."	For clarity	x			
82	Annex II; II.13/4	Please change "…included in standoff design basis…" to "…included in the standoff design basis…"	This is grammatically correct.	x			
83	Annex II; II.15/2	Please change "…multi-unit site, total…" to "…multi-unit sites, total…"	This is grammatically correct.	x			
84	Annex II; II.15/3	Please change "…to external event is assessed taking consideration of accident condition of all units of the site,…" to change "…to an external event is assessed taking into	This is grammatically correct.	x			

Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		consideration ~~of~~ the accident condition ~~of~~ for all units of the site,…"					
85	Annex II; II.15/4	Please revise "…as external event induces common cause failure." to "…since an external event can induce a common cause failure."	For clarity	x			
86	Annex II; II.16/5	Please change "…30 years is needed for estimated…" to "…30 years is needed ~~for~~ to estimate~~d~~…"	For clarity	x			
87	Annex II; II.23 2)/2	Please change "…is looked into…" to "…~~is~~ are looked into…"	This is grammatically correct.	x			
88	Annex III; III.1/1	Please revise "…means of comparison and ranking of them in the second stage of siting process." to "...by comparing and ranking them in the second stage of the siting process."	For clarity	x			
89	Annex III; III.2/1	Please change "…suggests approach to arrive at preferred site from the candidate ones by means of comparison…" to "…suggests an approach to arrive at the preferred site from the candidate ones by means of a comparison…"	This is grammatically correct.	x			

Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
90	Annex III; III.3/1	Please reword the first sentence as follows: "Candidate sites are evaluated against those characteristics issues, events, phenomena, hazards, and negative attributes which can be compensated for by means of engineering, site protection or administrative measures."	For clarity.	x			
91	Annex III; III.3/7	Please change "…inadequate during…" to "…inadequate during the…"	This is grammatically correct.	x			
92	Annex III; III.4/1	Please change "…Comparison between the candidate sites is done on…" to "…Comparisons between the candidate sites ~~is~~ are done on…"	This is grammatically correct.	x			
93	Annex III; III.4/2	Please change "…example of such parameter is cost-differential. Cost-differential…" to "…example of such a parameter is site cost-differential. Site ~~C~~cost-differential…"	For clarity.			x	The text is clear
94	Annex III; III-5 (10)	Renumber each statement in this section starting with 1. There is no reason to start from 10...	Error correction	x			
95	Annex III; III-5 (11)	Please change "Let's design…" to "Assume design…"		x			

Comments Resolution:
DS433 Draft 00.008 Safety Aspects in Siting for Nuclear Installations

COMMENTS BY REVIEWER Reviewers: CNSC, in consultation with Canadian Nuclear Industry Country/Organization: CANADA/Canadian Nuclear Safety Commission Date: May 2011				RESOLUTION Date: 2011-08-15			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
General	All	This is a well written document with a suitable level of detail and will complement CNSC's existing site evaluation regulatory documents, namely: RD-346 *Site Evaluation for New Nuclear Power Plants* and (draft) RD/GD368.1 *Licence Application Guide – Licence to Prepare Site for a Class I Facility: Nuclear Power Plants and Small Reactors*		879m, .			
1	Forward	Suggest rewording to "*in consultation with the competent **organizations**" or "in consultation with the competent **Member States***"	To clarify who the consultation is done with	x			
2	Table of Contents	"Annex 1…….33"	"Annex 1" does not appear in the Table of Contents.	x			
3	1.3	"if the site related parameters **are** changed"	Grammar error	x			
4	1.4	Suggest rewording to "the impact of an accident on **people and** the environment."	For consistency with section 1.2 point (b)	x			
5	1.9	"…such as regulatory bodies, government bodies, **future licensees (generally the operating organization)** and their contractors.	In some nations (such as Canada), the licensee is responsible for siting and is required to defend the case for the site(s) to the regulators.	x			

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6	1.10	"other aspects the play an important role in the siting process such as technology, economics, **land use planning,** cooling water availability, non-radiological environmental impact, and public opinion".	Land use planning includes existing and future planed land uses in the vicinity of the proposed site which is an important aspect in the siting process.	x			
7	1.11	"The data collected and the methods used for these few sites should be treated with similar care and scrutiny as for the finally selected site because this data **c**ould eventually be used"	The data collected for the few sites would not all be used – only that for the selected site.	x			
8	1.13	"This Safety Guide includes considerations for the siting of new nuclear installation**s** at new site**s** and provides recommendations for the siting of new nuclear installations that **are** to be located with other installations at existing site**s.**	Grammar correction	x			
9	1.14	Consider additional wording or footnote to clarify that "spent fuel storage facilities" does not include permanent disposal repositories. (e.g. Geological Repositories)	Permanent disposal repositories are usually sited separately from nuclear facilities and have different considerations because of the longer lifecycle timelines involved.			x	Nuclear Installations is well defined in Ref [1] and does not include permanent disposal repositories (like geological repository) – there is no need to repeat

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10	2.3 – Figure 1	Revise Site Evaluation bracket to indicate the process "continues throughout the entire lifetime of the installation" (section 2.4)	Consistency			x	The figure is O.K. and is consistent with other Safety Guide (SSG-16) There is an overlap of Site evaluation with late stage of site selection.
11	2.5 – Figure 2	Should use the term "Site Evaluation" in figure 2 rather than "Siting Evaluation" and the word "Site" should be added to "Assessment" to read "Site Assessment" for consistency with section 2.1 and Figure 1.	Grammar correction and consistency of wording	x			
12	Figure 3	Please correct typographical errors in figure	typographical errors	x			
13	3.3 Item 2	"**The** principal objective of this step is to exclude unfavourable site**(s)**"	To indicate that more than one site can be excluded during this stage, consistent with Figure 3.	x			

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14	3.18 Item 2	Revise clause to state: "***Before a construction licence or permit is granted**, it should be confirmed that there will be no insurmountable difficulties in establishing an emergency plan for the external zone before the start of operation of the plant"*	In environmental assessments, this is an issue that is particularly important to the public in the region surrounding the site and they should have reassurance that the regulator can withhold the licence / permit if the applicant cannot meet this criterion. The modified sentence still allows the regulator to issue a licence (with a hold point) on conditional acceptance of the applicant's demonstration.	x			
15	3.18 Items 7 and 8	Consider merging items 7 and 8	Item 7 appears to be supporting text for item 8 so they should be merged.	x			

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16	3.23	Revise clause to state: "***Suppliers of NPP technologies typically offer non-site specific generic design information for consideration in bounding envelope cases[1] being used for a siting exercise. This information identifies some of the design bases for site related load cases. The siting organization can then use this information to either screen out candidate sites or decide where design changes may need to be made to bring the design into the site bounding envelope. When considering a vendor's generic information, the siting organization should examine the bases and credibility of the vendors' generic information, particularly in first-of-a-kind designs."***	1. Existing sentence is not clear. 2. "PPE" as a term has different meanings in different countries and should be described more generically. 3. There is a need to inform the siting organization looks at the vendor's data with a critical eye as the vendor's data will come under public scrutiny during licensing.	x			
17	Heading above 3.24	Revise title to: "Siting of New Nuclear Installations **<u>at</u>** Existing Site**<u>s</u>**"	Grammar correction	x			

[1] Also known in some jurisdictions as a Plant Parameter Envelope (PPE)

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18	3.24	Consider adding new text to existing sentence: *"**The existence of a nuclear installation should not lead to an automatic assumption that the site is suitable for a new nuclear installation. The siting process should be conducted at the same level of rigour as that for a new site."***	Wording of existing text needs to be strengthened as governments / licensees can be lulled into accepting a site with less than an adequate amount of siting data. This has the potential to lead to significant licensing delays and public interest issues.	x			
19	4.2	"IAEA NS-R-3 **[1]** "	Incorrect reference number cited	x			
20	4.4 items (d) and (e)	Consider adding text to these items to identify "low cooling water intake level" as a related safety criterion. Alternatively, identify this separately.	While flooding poses a hazard to the plant, loss of heat sink poses a similarly serious scenario and is a long term site suitability issue.	x			
21	4.7 item (c)	Revise item (c) to state: "*Population **and land use** considerations"*	Land use in the vicinity of the proposed site is an important aspect in the siting process.	x			

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22	4.9 item (a)	Sentence is vague and requires clarification. Suggest deleting (a) entirely.	Threat criteria in siting are generally deterministic in nature. "High Potential Threat" has a different meaning to each stakeholder and there are some who would argue that the facility itself would bring a "high potential threat" risk where before there was none. Clause 4.9 can stand on its own without item (a).		x		We change the wording to be less restrictive. The intent is to consider security aspects at this level for site selection purpose (I agree that the threat is national dependent – and for this reasons we live it general)
23	4.9 item (e)	This clause at a policy level is not clear enough to implement. Please revise. Perhaps: "***consideration should be given to locating the site away from areas of high population density and in consideration of public transport routes that could lead to a threat against the facility or impede execution of emergency plans***."	What is the definition of a "population centre"? In Republic of Korea this is clearly defined but in many other countries, it is not. Acceptance criteria for "public transport" route are also not clear.	x			

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24	4.12	Some examples of aspects to be considered that are not directly safety related include (but **are** not necessarily limited to) the following: a)….. h) **Land use planning** i) **Aboriginal considerations**	Land use planning includes existing and future planed land uses in the vicinity of the proposed site which is an important aspect in the siting process. In some countries, aboriginal considerations can play a key role in the siting exercise and if not conducted early, can significantly delay or stop a new build project.	x			
25	5.12	Suggest wording correction: "To enable **initiation** of the activities of the second stage"	Clarity of wording	x			
26	6.9	Suggest wording correction: "Furthermore, depending on the consequences of the external hazards considered as screening criteria**,** the protection feasibility"	Grammar correction	x			
27	7.10	"See references **[12, 13]** for requirements, recommendations and guidance on management systems."	Incorrect reference numbers cited	x			

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28	Appendix A - 3.	"Detailed data requirements (for the final selection process) are the same as those required for nuclear safety and are specified in the relevant Safety Guide **[5].**"	Incorrect reference number cited.	x			
29	Appendix A – 9.	"A clear definition of capable faults is given in the Safety Guide **[5]** together with recommended site investigations in relation to potential capable faults."	Incorrect reference number cited.	x			
30	Appendix A – 17.	"Detailed requirements are similar to those recommended in the relevant Safety Guide **[8]**"	Incorrect reference number cited.	x			
31	Appendix A – 18, 21,22,25	References to "sea" or "ocean" should be made more generic to reflect flooding from lakes	To reflect sites near large inland lakes where 'coastal flooding' is also a possibility.	x			
32	Appendix A - 24.	"The Safety Guide **[6]** provides simple screening criteria that can be employed that need only minimal data. If the proposed site does not satisfy the conditions for applying the screening criteria in **[6]**..."	Incorrect reference number cited twice.	x			
33	Appendix A - 29.	"Information provided in the Safety Guide **[6]** will be useful for further work in this area."	Incorrect reference number cited.	x			

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34	Appendix A – 31(b)	Add new sentence. "C***onsideration should be given to the fact that in-ground works of the nuclear facility can have a significant effect on the site drainage characteristics."***	A NPP excavation for a base-mat also includes a waterproof liner for in-ground structures so natural drainage will be diverted around the facility and may adversely affect previously stable drainage areas on the site.	x			
35	Appendix A – 32.	"Information provided in the Safety Guide **[6]** will be useful for further work on this area."	Incorrect reference number cited.	x			
36	Appendix A – 33.	Please revise first sentence to state: "*The human induced events database provides information describing the type, severity and frequency of* ***past*** *events* ***in the vicinity of the site*** *and…"*	Clarification of text.	x			
37	Appendix A – 36.	"Further guidance on undertaking these analyses is available in Safety Guide **[3]**."	Incorrect reference number cited.	x			
38	Title above Appendix A – 38	Should be changed to "***DATABASE ON POPULATION, LAND USE AND ENVIRONMENTAL ASPECTS***"	Land use planning is an important aspect in the siting process.	x			

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39	Appendix A – 38.	Add sentence: "***The database should not only address past and existing population and land use data, but also project both areas into the future for the life cycle of the of the proposed facility."***	To address concepts introduced in Clause 1.1.			x	Projecting the future evolutions is a result of the analysis and interpretation of the collected data that should be included in supporting documents for getting site license.
40	Appendix A – 39.	"Information provided in the Safety Guide **[4]** will be useful for further work in this area"	Incorrect reference number cited.	x			
41	Annex I – Table I-2	Consider adding vertical lines to the table to identify groupings	For clarity	x			
42	Annex I – Table I-2	Insert "√" under DS-417 for all categories under extreme meteorological events.	DS-417 "*Hydrological and Meteorological Hazards in Site Evaluation for Nuclear Installations*" is an applicable Safety Guide for extreme meteorological events and should be cross referenced in this table.	x			
43	Annex II – II.6, 3	Under "Ultimate Heat Sink", add "***cooling air characteristics (for cooling towers)***" or 'point' reader to II.6, 2 ii)	Local air quality (humidity, winds, effects of inversions" can adversely affect cooling tower performance and can be a siting factor.	x			

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44	Annex II – II.6 ii) d) and II.17	"**Lightning**"	Spelling error	x			
45	Annex II – II.9, 6 ii)	"State**, provincial or territorial** government"	For clarity and inclusiveness	x			
46	Annex III – III-5	Restart bullet numbering so that 10 is 1, 11 is 2, etc.	This numbering was carried over from the previous Annex. For consistency with the rest of the Annex, change "III-5" to "III.5"	x			
47	Annex III – III-5, item 11	"**D**esign parameters related to different candidate sites"	Removal of word "Let's" from the beginning of the sentence for clarity.	x			
48	Annex III – III-5, item 13	Suggest rewording "(III-1)" and "(III-2)" to read "(**Formula**-1)" and "(**Formula**-2)"	To indicate that this is the formula number, and to prevent people from thinking Table III-1 only applies to the first equation.	x			
49	Abbreviations	Add "MS Member States"	This abbreviation is used in section II.14	x			
50	Section 3.26 (f)(i)	Replace "doses to members of the public will increase" with "doses to members of the public **may** increase	Although it is expected that doses will increase, it is not certain.	x			

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51	Section 3.26 (f)(i)	Add the following text to the end of the paragraph. "**Local regulatory requirements should be followed in determining site boundary and dose acceptance criteria**."	DS443 implies that the site boundary will be extended to encompass the new nuclear installation; however, the new nuclear installation may be creating a new "site" in close proximity to the existing nuclear "site". Requirements to define a new vs. existing site (and thus dose acceptance criteria) fall to the local regulatory requirements and should not be presumed by this safety guide.	x			