

Draft Specific Safety Guide DS433 “Safety Aspects in Siting of Nuclear Installations”, Version 2011-08-15 (Draft 00.09)

COMMENTS BY REVIEWER Reviewer: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) (with comments of Federal Office for Radiation Protection and GRS) Page 1 of 16 Country/Organization: Germany Date: 2011-09-23					RESOLUTION 2011-10-10			
Relevance	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
3	1	Whole draft	Use uniform terminology: <ul style="list-style-type: none"> • either ‘enrichment facilities’ or ‘enrichment plants’, • either ‘fuel fabrication facilities’ or ‘fuel fabrication plants’, • either ‘reprocessing plants’ or ‘reprocessing facilities’. 	Editorial.	X			
2	2	General	Please use the hazards listed in SSG-3 to be in line with this guide and quote this guide “Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants, IAEA Specific Safety Guide No. SSG-3”	Completion.			X	The Higher level document is NS-R-3 (Requirements for Site Evaluation) and the current draft SG fully complies with NS-R-3 and all SGs under NS-R-3.
3	3	1.2	2 nd sentence: “... the prevention of accidents and it ^{its} mitigation are ...”	Editorial.	X			
2	4	1.3 1st line	“...of a site suitable for the <u>nuclear</u> installation...”	Completeness	X			
3	5	1.3, 3 rd line	“The ₂ outcome of this task...”	Delete Comma	X			
3	6	1.7	1 st sentence: “There is now the need to update the previous IAEA Safety Guide, “Site	Editorial.	X			

			Survey for Nuclear Power Plants”, 50-SG-S9, <u>published in 1984</u> [16]–, in view of an increasing interest ...”					
3	7	1.8	last sentence: “... a suite of preferred sites any of which could be selected for the construction <u>and operation</u> of a nuclear installation.”	Completeness.	X			
3	8	1.10	2 nd sentence: „... there are other aspects that play an important role in the siting process, such as security aspects, technology, economics, land use planning, cooling water availability, non-radiological environmental impact, and public opinion <u>socio-economic aspects including public acceptance.</u> ”	Wording. Compare with para 4.12 (f).	X			
2	9	1.14	Add new last sentence: “... other nuclear installations. <u>The siting of radioactive waste disposal facilities is addressed in Ref. [17, 18].</u> ” Include new Ref. [17, 18] to the IAEA Safety Series No. 111-G-3.1 and 111-G-4.1 with respect to the siting of near surface disposal facilities and geological disposal facilities, respectively.	Completion since the difference between ‘nuclear installations’ (excluding waste disposal facilities) and ‘nuclear facilities’ (including waste disposal facilities) is often not well-known. See definitions in the IAEA Safety Glossary, 2007 Edition.			X	The high level document NS-R-3 (Requirements) apply to all Nuclear Installations.
2	10	2.4	2 nd sentence: “Thus, site evaluation continues throughout the entire <u>operating</u> lifetime of the installation to take into account the changes ...”	Clarification to assure consistency with the 1 st sentence as well as with para 2.1. See definition of ‘lifetime’ in the IAEA Safety Glossary, 2007 Edition. Decommissioning is a stage in the lifetime of a nuclear installation, too, as stated in other IAEA Safety	X			

				Standards. See e.g. <ul style="list-style-type: none"> • SSG-12 “Licensing Process for Nuclear Installations” (para 2.5) • NS-R-5 “Safety of Nuclear Fuel Cycle Facilities” (para 1.4) • NS-R-4 “Safety of Research Reactors “ (para 1.15) 				
3	11	Figure 2	It should be labelled when a site comes ‘under regulatory control’ (in opposite to ‘release from regulatory control’).	Completeness.			X	Regulatory control varies from country to country and cannot be mentioned.
2	12	2.6	“The siting and site evaluation processes should comply with the licensing process defined by the Regulatory Authority and be consistent with IAEA Safety Standards on this topic [9, 10]. <u>Recommendations on structure and content of the SER, the FSAR and the PSAR are provided in Ref. [19].</u> ”	Amendment. Include new Ref. [19] to the IAEA Safety Guide GS-G-4.1 with respect to the Safety Analysis Report.				The Siting (scope of DS433) is a de-regulated activity. No license is required for Site Survey and Site Selection. (Licensing of NPP is given in SSG-12)
2	13	2.7, (a), 2 nd line	“...preclude the <u>construction and</u> safe operation...”	Completeness			X	There are no construction issues in case a site does not fulfill the exclusion criteria.
3	14	3.1	2 nd sentence: “... implementation of mitigation measures in case <u>of</u> radiological release.”	Missing word.	X			
3	15	3.1, 4 th	“...should be conductive to the imple-	Correction and wording	X			

		and 5 th line	mentation of mitigation measures in the case of radiological release.”					
3	16	3.2	last sentence: “Details of a siting process for a nuclear installation is <u>are</u> described in Fig.3.”	Editorial.	X			
2	17	3.3, (2), 1 st line	“...the potential <u>available</u> sites are...”	Clarification (cf. 2.3)			X	No need to add ‘available’.
3	18	3.5	2 nd sentence: “... done by the owner organization of the nuclear installation taking input from all the <u>stakeholders</u> .”	Editorial.	X			
3	19	3.6, 5 th line	“...of siting criteria; regional_criteria, ...”	Delete minus (-)	X			
3	20	3.7	3 rd sentence: “... are also important considerations for regional analysis.”	Editorial.	X			
3	21	3.8	2 nd bullet point: “... available. These criteria, listed in Table I-1 of <u>Annex I</u> , are used to facilitate the selection process through ...”	Editorial.	X			
3	22	3.18	1 st and 2 nd sentence: “The site safety requirements cited in Ref 4 <u>Ref. [1]</u> as the primary source for establishing the screening criteria to the siting process. The site safety requirements are reproduced below.”	Editorial.	X			
1	23	3.18, (b), 6, 3 rd line	“...then the site should <u>shall</u> be deemed unsuitable.”	Clarification	X			
2	24	3.18	Point 7: “The region should be investigated for installations ... in which flammable, explosive, asphyxiate, toxic, corrosive or radioactive materials are <u>disposed of, deposited</u> , stored, processed, transported and otherwise dealt with ...”	Completeness. Radioactive waste is finally disposed of, while non-radioactive waste is finally deposited.			x	3.18 – 7 deals with human induced hazards. The concern is for deposits of hazardous materials.

3	25	3.24, 1 st line	“...for construction of <u>a</u> new nuclear installation...”	Wording	X			
1	26	3.26, 2 nd , 3 rd and 4th line	“...vice versa, should <u>shall</u> be considered. The impact of a new installation in an existing site should <u>shall</u> be assessed in a composite manner. Considerations for ...”	Clarification / correction. The impact of a new nuclear installation at existing sites must be investigated in order to evaluate possible radiological and other risks (cf. 3.18 (b) 7)			X	Shall is not used in a SG.
2	27	3.26 (b)	2 nd sentence: “The nature of accidental events will depend on the type of activities taking place <u>facility where they occur</u> , e.g. <u>nuclear</u> power reactor, nuclear spent fuel storage <u>installation</u> , and <u>or</u> nuclear fuel reprocessing facility.”	Clarification and completeness	X			
3	28	3.26 (e)	“... most external hazards can initiate common cause faults, and the effects of this <u>these</u> should be accounted for.”	Editorial.	X			
2	29	3.26, (f)	“ <u>Where the new facility forms part of an existing nuclear site, then the net effect of both facilities in terms of safety should be considered. The following are examples of what should be considered:</u> (i) Compliance with dose...”	Missing text	X			
2	30	4.4 (b)	Vibratory ground motion due to earthquakes <u>seismic activity</u>	Completion. Since, local strong vibratory ground motion can result also from other seismic activities than tectonic earthquakes, e.g. due to volcanic activity, underground detonation, reservoir-induced earthquakes, geothermic projects			X	Eartquakes are covered by SSG-9, Volcanos by DS405 and Explosions and other man made hazards are covered by NS-G-3-1. The terminology is consistent

								to IAEA Safety Standards relevant for the scope of DS433.
2	31	4.4 (h)	Other extreme meteorological events such as <u>droughts</u> , extreme precipitation, including snow pack; <u>extreme hail</u> , extreme temperatures, including the temperature of the source of the cooling water; and lightning	Completion.	X			
3	32	4.4 (i)	“Geotechnical hazards such as ... subsidence, uplift, collapse, <u>avalanche</u> ”	Missing comma. Add “avalanche”.	X			
2	33	4.4 (k), add (l)	k) Credible Combinations of events <u>Biological hazards</u> l) Credible Combinations of events	Completion. Add the topic “Biological hazards” before “Credible combinations of events”.				These are not really hazards; They should be considered during design of the intake system.
1	34	4.7	In the 1 st sentence (“The fourth set of criteria is linked to the third set but it relates mainly to the demonstration of the feasibility of emergency plan implementation for the nuclear installation.”), the term ‘emergency plan’ should be specified in more detail, e.g. ‘on-site emergency plan’, ‘off-site emergency plan’ or ‘on-site and off-site emergency plan’.	There are different requirements for on-site and off-site emergency plans, mainly in terms of responsibilities (licensee, authorities, response organizations). See also Annex II, paras II.26 to II.28 (subsection “EMERGENCY MANAGEMENT PROCEDURE”).	X			
3	35	4.7 (f)	“Agricultural activities those <u>that</u> are sensitive to possible discharges of radionuclides.”	Editorial.	X			
3	36	4.9 (d)	“... the ultimate heat sink-, if any, is not readily accessible ...”	Missing comma.	X			
2	37	4.11	“OTHER CRITERIA In the site survey and site selection process another set of criteria are <u>is</u> concerned with con-	<ul style="list-style-type: none"> The subsection with title “OTHER CRITERIA” has to 	X			

			siderations...”	placed before para 4.11. • (singular needed, "is" instead of "are")				
2	38	4.12 (g)	“Land use planning <u>Planned uses of land and water in the region”</u>	Completeness. See IAEA Safety Standards NS-R-3 (para 4.14) and NS-G-3.2 (section 4).	X			
2	39	5.4	1 st sentence: “The analyses performed based on the collected data should consider the total <u>operating</u> lifetime of the nuclear installation.”	Clarification. See also comment to para 2.4.	X			
3	40	5.6-5.7	Between Para 5.6 and 5.7 delete: 7.	Editorial.	X			
3	41	5.8	“The following databases should be established for the siting process and is <u>are</u> further elaborated in detail in Appendix-A for different stages of siting process: ...”	With this amendment, para 5.15 is dispensable and can be deleted.				
2	42	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 <u>hazardous airborne releases</u> that could affect the site.”	Only "toxic plumes" are mentioned. The more general term "hazardous airborne releases" is proposed instead. See also Chapter 3.17 pos. 7, where other hazardous properties "flammable, explosive, asphyxiate, toxic, corrosive" were mentioned.	X			
3	43	5.15	Delete this para.	See comment to para 5.8.	X			
1	44	6.2	“For the purpose of site survey and site selection, these installations should be graded on the basis of their complexity, potential radiological hazards, and <u>non-radiological</u> hazards due to other materials present <u>the presence of flamm-</u>	Clarification and completion with respect to nuclear fuel cycle facilities. In conversion facilities and uranium enrichment facilities, for example, the main			X	This is standard sentence on the grading approach used in all new guides.

			<u>mable, explosive, toxic or corrosive materials, such as uranium hexafluoride (UF₆) or hydrogen fluoride (HF).</u> ”	hazards are UF ₆ and HF. The chemical toxicity of uranium in a soluble form such as UF ₆ is more significant than its radiotoxicity.				
3	45	6.3	last sentence: “... are included in the final site selection acceptance criteria”.	Editorial.	X			
2	46	6.5 (a)	“The amount, type and status of the radioactive inventory, <u>including inventory of fissile material</u> , at the site ...”	Clarification and completion.			X	This is standard sentence on the grading approach is used in all new guides.
3	47	6.5 (d)	“The configuration of the installation for <u>authorized</u> activities of different kinds;”	Clarification.			X	This is standard sentence on the grading approach is used in all new guides.
3	48	6.5 (f)	“The changing nature of the configuration and layout for installations designed for experiments (<u>such activities at which may be unpredictable have an associated intrinsic unpredictability</u>);”	Wording.			X	This is standard sentence on the grading approach is used in all new guides.
3	49	Title of Section 7	“MANAGEMENT SYSTEMS AND INCLUDING QUALITY MANAGEMENT”	The term ‘management system’ reflects and includes the initial concept of ‘quality control’ and its evolution through ‘quality assurance’ and ‘quality management’, as stated in the IAEA Safety Requirements GS-R-3 (para 1.4).		X		
2	50	7.9, 3 rd line	“...total power generation of <u>a nuclear power plant (NPP) project</u> , ...”	Explanation of NPP	X			
2	51	7.12, 1 st line	“...traceable and transparent <u>to the public</u> , to users and reviewers...”	Completeness	X			

3	52	Ref. [8]	INTERNATIONAL ATOMIC ENERGY AGENCY, NS-G-3.6 Geotechnical aspects of site evaluation and foundations for Nuclear Power Plants, <u>IAEA Safety Standards Series No. NS-G-3.6, IAEA, Vienna (2005).</u>	Editorial.	X			
3	53	Ref. [14]	Delete this reference.	Ref. [14] is not cited in the draft.			X	IAEA glossary is referred to check any definition.
3	54	Ref. [15]	[15] [15] INTERNATIONAL ATOMIC ENERGY AGENCY, ...	Editorial.	X			
3	55	References	INTERNATIONAL ATOMIC ENERGY AGENCY, Siting of Near Surface Disposal Facilities, IAEA Safety Series No. 111-G-3.1, IAEA, Vienna (1994) [will be superseded by DS356].	Add the IAEA Safety Series No. 111-G-3.1 to the list of references (see comment to para 1.14).			X	Does not apply to Site Survey and Site Selection (SITING)
3	56	References	INTERNATIONAL ATOMIC ENERGY AGENCY, Siting of Geological Disposal Facilities, IAEA Safety Series No. 111-G-4.1, IAEA, Vienna (1994) [will be superseded by DS334].	Add the IAEA Safety Series No. 111-G-4.1 to the list of references (see comment to para 1.14).			X	Does not apply to Site Survey and Site Selection (SITING)
3	57	References	INTERNATIONAL ATOMIC ENERGY AGENCY, Format and Content of the Safety Analysis Report for Nuclear Power Plants, IAEA Safety Standards Series No. GS-G-4.1, IAEA, Vienna (2004).	Add the IAEA Safety Guide GS-G-4.1 to the list of references (see comment to para 2.6).			X	Does not apply to Site Survey and Site Selection (SITING)
3	58	References	<u>INTERNATIONAL ATOMIC ENERGY AGENCY, Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants, Specific Safety Guide No. SSG-3 IAEA Specific Safety Guide No. SSG-3, IAEA, Vienna, (2010).</u>	Add the IAEA Specific Safety Guide SSG-3 to the list of references.			X	Does not apply to Site Survey and Site Selection (SITING)
3	59	Appendix A, 2.	“The database should be <u>comprehensive, up-to-date and</u> compiled to sup-	Completion. Correct citation.	X			

			port the evaluation and judgment of relevant number of thematic sets given in Section 4.0.”					
2	60	Appendix A, Seismological Database		Since local strong vibratory ground motion can result also from other seismic activities than tectonic earthquakes, e.g. due to volcanic activity, under-ground detonation, reservoir-induced earthquakes, geothermic projects, such reasons should be considered in seismic databases used for siting			X	Earthquakes are well covered by SSG-9 (detailed assessment is required in the site evaluation stage (out of scope of DS433)
2	61	Appendix A, 12.	“... may affect the safe operation of nuclear installations. <u>Thus, such products</u> should be evaluated ...”	Clarification	X			
3	62	Appendix A, 12.	VOLCANOES AND ASSOCIATED TOPICS IN RELATION TO NUCLEAR POWER PLANT SITING, IAEA, VIENNA, IAEA-PSSS-01 (1997).	Add this IAEA document to the list of references:			X	This document has been superseded by DS-405.
3	63	Appendix A, 13.	VOLCANOES AND ASSOCIATED TOPICS IN RELATION TO NUCLEAR POWER PLANT SITING, IAEA, VIENNA, IAEA-PSSS-01 (1997).	Add this IAEA document to the list of references:			X	This document has been superseded by DS-405.
3	64	Appendix A, 24., 5 th line	“...that can be employed <u>and</u> that need only minimal data.”	Wording	X			
3	65	Appendix A, 31.	“(a) ... parameters like T temperature, humidity, atmospheric pressure, wind speed, precipitation, icing, <u>ice-storms</u> , sandy storms, ice-storms etc. ...”	Editorial.	X			
3	66	Appendix	“(a) ... be used to some extent for the	Editorial.	X			

		A, 36.	evaluation of the site ...”					
3	67	Tables I-1, I-2	Repeat the headline if there is more than one page for a Table.	Editorial.	X			
2	68	Table I-1	Amend footnote with explanation for use of the symbols “✓” and “√”.	Clarification and completion.	X			
2	69	Table I-1	Earthquake <u>Seismicity</u>	Completion. Since, local strong vibratory ground motion can result also from other seismic activities than tectonic earthquakes, e.g. due to volcanic activity, under-ground detonation, reservoir-induced earthquakes, geothermic projects			X	Irrelevant for site selection stage.
2	70	Table I-1	Add: <u>Landslide</u> <u>Avalanche</u> <u>Karst</u>	Completion of Geotechnical.			X	Slope instability covers landslide. Karst will be added wherever required.
2	71	Table I-1 Line 6	Slope Instability (Massive) <u>Slope Instability</u> (Minor)	Clarification: In line 6 only “(Minor)” is written. Type “Slope Instability” to which “(Minor)” is related should be added.	X			
2	72	Table I-2	Add: Landslide Avalanche Karst	Completion of Geotechnical.	X			Slope instability covers landslide. Karst will be added.
3	73	Table I-2	Add Ref. numbers in the headline of the table: NS-R-3 [1], NS-G-3.1 [3], NS-G-3.2 [4], SSG-9 [5], DS417 [6], DS405 [7], and NS-G-3.6 [8]. Add the IAEA Safety Guides NS-G-1.5 and NS-G-1.6 to the list of references.	Editorial.	X			
3	74	Table I-2	VOLCANOES AND ASSOCIATED TOPICS IN RELATION TO	Add this IAEA document to the list of references:			X	Superseded by DS-405

			NUCLEAR POWER PLANT SIT- ING, IAEA, VIENNA, IAEA-PSSS-01 (1997).					
3	75	Table I-2	Formatting of columns 1 and 2 is wrong, so words are incomplete and syllabication is wrong/not activated.	Editorial.	X			
3	76	Table II- 10 7 th bullet	<ul style="list-style-type: none"> “Proximity <u>to</u> load centres i) Power distribution grid lines ii) Location of major power consuming units/facilities/population” 	missing word "to"	X			
1	77	Annex I, I.1	“It should be pointed out that there may be cases which are not con-sistent with Table I-4 ₂ due to the specific conditions”	Wrong Table-N°. It would mean: Table would not be consistent with itself	X			
3	78	Annex II, II.1	2 nd sentence: “This annex is intended to be used by the <u>stakeholders</u> associated with the siting process of NPP.”	Editorial.	X			
3	79	Annex II, II.2	2 nd sentence: “Examples are given in this Annex on the events of accidents and / or external <u>natural hazards phenomena includ-</u> ing as well as external human induced events of sabotage.”	Wording. Natural phenomena don't include external human in- duced events of sabotage. Annex II doesn't specifically address events of malevolent origin.	X			
3	80	Annex II, II.3	1 st bullet point: “External natural hazards.”	Editorial.	X			
2	81	Annex II, II.5	“iv) ... including projections for the <u>operating</u> lifetime of the nuclear power plant”	Clarification. See also com- ments to paras 2.4 and 5.4.	X			
2	82	Annex II II.6	Add: <u>5. Biological hazards</u> i) <u>Organic material in water (extreme</u> <u>amount of e.g. fishes, jellyfishes, al-</u> <u>gae, mussels, leaves, ...)</u> ii) <u>Degradation by animals (e.g. in-</u>	Completion.			x	These are not really hazards – should be con- sidered during design of the intake system.

			sects iii) Hazards due to bacteria iv) ...					
2	83	Annex II 6.2, i) b.	“Vibratory ground motion due to earthquakes seismic activity”	Completion. Since, local strong vibratory ground motion can result also from other seismic activities than tectonic earthquakes, e.g. due to volcanic activity, underground detonation, reservoir-induced earthquakes, geothermic projects			X	Not in line with NS-R-3 and SSG-9.
2	84	Annex II.6.2, vi)	Add: ... “i. <u>Volcanism</u> j. <u>Karst</u> k. <u>Landslide</u> l. <u>Avalanche</u> ”	Completion	X			
2	85	Annex II, II.8	Title of Point 5: “Management of radioactive waste during normal operation <u>and anticipated operational occurrences</u> ”	Completion to cover deviations from normal operation as well.			X	Covers all deviations.
2	86	Annex II, II.8	Change the structure of Point 5: i) Radioactive solid waste, ii) Radioactive liquid waste, iii) Radioactive gas release a. <u>Characteristics of waste</u> b. <u>Quantity</u> c. <u>Level of activity</u> d. <u>Management Strategy</u>	Completion. The proposed bullet point a. should include a description of radiological, physical and chemical properties of the radioactive waste, as recommended in Table II-1 of the IAEA General Safety Guide GSG-1 “Classification of Radioactive Waste”.	X			
3	87	Annex II, II.8	Title of Point 6: “ M Management of the R radioactive waste during accident conditions”	Editorial.	X			
1	88	Annex II,	Point 6 should have the same structure	Management of radioactive	X			

		II.8	as Point 5: i) <u>Radioactive solid waste</u> , ii) Radioactive liquid waste, iii) Radioactive gas release a. <u>Characteristics of waste</u> b. Quantity c. Level of activity d. Method of disposal <u>Management strategy</u>	solid waste during accident conditions is missing. See also comment to Point 5. Bullet point c. (Method of disposal) is dispensable since released radioactive gases cannot be disposed.				
2	89	Annex II, II.9	Note to bullet point 5 iii): The term ‘emergency planning zone (EPZ)’ needs to be specified in more detail, e.g. ‘precautionary action zone (PAZ)’, ‘urgent protective action planning zone (UPZ)’ (terminology according to the IAEA Safety Requirements GS-R-2) or otherwise ‘EPZ for exposure pathway’, ‘EPZ for ingestion pathway’ (terminology according to the NRC Regulatory Guide 4.7, Ref. [II-3]).	It is not clear which classification system is used here. The IAEA Safety Standards GS-R-2 and GS-G-2.1 establish requirements and recommendations for two designated off-site emergency zones: PAZ (3-5 km radius) and UPZ (5-30 km radius). Their definitions deviate from the NRC definitions of the emergency planning zones for exposure pathway (16 km radius) and ingestion pathway (80 km radius), respectively. See also comment to para II.26.			x	Annex II is not mandatory (is not part of the SG). It presents illustrative examples based on practice of different MSs.
2	90	Table II-1	Screening value No. 5: “Distance from large airport for yearly flight <u>operations</u> > 500d ² for yearly flight <u>operations</u> > 1000d ² ”	Correct citation from IAEA Safety Guide NS-G-3.1.	X			
3	91	Table II-1	Screening value No. 6: “Distance ... such as practice, bombing and fire ranges” Add reference to the screening value:	Editorial. Completion. The value is	X			

			30.0 km [II-4]	taken from the IAEA Safety Guide NS-G-3.1.				
3	92	Table II-1	Footnote *: “ Event of an <u>Accidental</u> aircraft crash at the site as due to take-off or landing operation at a nearby airport.”	Wording.	X			
3	93	Annex II, II.17	“In case of rare meteorological phenomena (e.g. lightning; tropical cyclone, hurricane and typhoon; <u>tornado</u> ; waterspout) ...”	Completeness. Compare with IAEA Draft Safety Guide DS417 “Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations” (Draft version 2010-04-29, paras 2.7 and 4.32).	X			
3	94	Annex II, II.18	“1) The design basis flood level at an NPP site <u>is</u> determined for ...”	Missing word.	X			
2	95	Annex II, II.20, 2 nd and 3 rd line	"Site specific Design Base Ground Motion (DBGM) parameters for earthquakes are derived to meet a target performance goal. To achieve the recommended performance goal for the new builds <u>installation</u> , DBGM the mean <u>DBGM</u> parameters for earthquakes should not have a frequency of exceedance higher than 10 ⁻⁴ [II-7]."	Clarification required. Suggestion: Revision of this sentence in order to avoid difficulties in understanding	X			
3	96	Annex II, II.22	1 st sentence: “In case the screening value given in Table II- 12 is not satisfied, ...”	Correct citation.			X	Table II-2 is correct
3	97	Annex II, II.23	“1) ... at the site. <u>Further guidance is provided by [II-3].</u> ”	Completion. Text provides a link to the IAEA Safety Guide NS-G-3.1 (sections 6 and 7).	X			
3	98	Annex II, II.25	“2) ... appropriate limits as specified by competent authorities of MS is <u>are</u> adhered to.”	Editorial.	X			
2	99	Annex II,	Note to the 5 th sentence	Clarification. See also com-			x	Annex II is not

		II.26	(“Off-site emergency management activity covers the area within radius not less than 16 km from the centre of NPP [II-3].”): The suggested radius corresponds to the emergency planning zone for exposure pathway according to the NRC Regulatory Guide 4.7. Please clarify the relationship to the off-site emergency zones (PAZ and UPZ) specified in the IAEA Safety Standards GS-R-2 and GS-G-2.1, if applicable.	ment to para II.9.				mandatory (is not part of the SG). It presents illustrative examples based on practice of different MSs.
3	100	References to Annex II	“References to Annex III”	Editorial.	X			
3	101	Ref. [II-2]	... <u>IAEA Safety Standards Series No. NS-G-3.23</u> , IAEA (2002).	Editorial.	X			
3	102	Ref. [II-3]	US NUCLEAR REGULATORY COMMISSION, General Site Suitability Criteria for Nuclear Power Plants <u>Stations</u> , Regulatory Guide 4.7 (rev-2), USNRC, Washington DC (1976) (<u>1998</u>).	Cite the correct title and year of publication. See NRC-Website: http://www.nrc.gov/reading-rm/doc-collections/reg-guides/environmental-siting/rg/04-007/	X			
3	103	Ref. [II-4]	INTERNATIONAL ATOMIC ENERGY AGENCY, External Human Induced Events in Site Evaluation for Nuclear Power Stations <u>Plants</u> , <u>IAEA Safety Standards Series No. NS-G-3.1</u> , IAEA (1998) (<u>2001</u>).	Cite the correct title and year of publication.	X			
2	104	Ref. [II-5]	Please add full reference to the AERB code.	Missing information.	X			
3	105	Ref. [II-6]	INTERNATIONAL ATOMIC ENERGY AGENCY, Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations, <u>IAEA</u>	The Safety Guide is not yet published. Compare with citation of Ref. [6].	X			

			Safety Standards Series, design Safety Guide No. (Draft DS417), IAEA (To be published in 2011).					
3	106	Ref. [II-8]	NUCLEAR SAFETY STANDARDS COMMISSION (KTA), Flood Protection for Nuclear Power Plants, KTA 2207 (11/2004), KTA, Salzgitter (2004).	Editorial.	X			
3	107	Ref. [II-9]	US NUCLEAR REGULATORY COMMISSION, Ultimate Heat Sink for Nuclear Power Plants, ...	Editorial.	X			
3	108	Title of Annex III	“COMPARISON AND RANKING OF CANDIDATE SITES”	Editorial.	X			
3	109	Annex III, III.5	“4. ... W where; C_j^a and C_j^e are the absolute and effective cost difference ...”	Editorial.	X			
3	110	Annex III, III.5	“5. ... is always greater than unity. It's <u>Its</u> value depends on ...”	Editorial.	X			

Comments Resolution: DS 433 “ Safety Aspects in Siting for Nuclear Installation”

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer Lee Gonzales H.M., Medici M.A. Page.1 of 1 Country/Organization: Argentina/Nuclear Regulatory Authority Date: September 2011				Date: 2011-10-10			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	3.26 (ii)	Eliminate	Superfluous. It was well addressed in the previous points.			X	It covers an additional scenario and clarifies another situation.
2	3.26 (iii)	Change “(iii)” by “-“	Editorial			X	Not required
3	3.26 (iii)	..combinations effects of the both installations...	More than two installations could be involved in the sitting assessment.	X			

Member State Comments on IAEA Draft Safety Guide “Safety Aspects in Siting for Nuclear Installations” (DS433)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America				Date: 27 September 2011			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1.15 / 1 / Pg 11	Comment: Give reference or example guide that provides guidance on the final evaluation or characterization.	Provide an avenue for reader to pursue further information.	x			
2	2.4 / 7 / Pg 13	Thus, site evaluation continues throughout the entire lifetime of the installation <i>with applicable components captured in the Final Safety Analysis Report (FSAR)</i> to take into account the changes in site characteristics, availability of data and information, operational records, regulatory approaches, evaluation methodologies and safety standards [1,3,4,5,6,7,8	Emphasize need to capture significant changes in site characteristics.	x			
3	3.17 / Pg.19	Data collection related to potential and candidate sites should focus on attributes of these sites that may play a significant role as exclusion criteria to the extent possible, <u>and documented in the Preliminary Safety Evaluation Report (SER).</u>	Need documentation on suitability of potential sites for comparison.			x	It is not mandatory to document site selection process in Safety Evaluation Report (could be documented in other supporting documents). SER deals with detailed Site Evaluation that demonstrate site suitability (after selection was done).
4	3.18/1	Change “as” to “are”	Clarity	x			
5	3.18 (b) 2	Indicate the following: The evaluations, technical bases, and determinations of whether there are	Section 3.18(b), Screening Criteria Item 2 stated that “before a construction license or permit is granted,			x	3.18 (b) 2 (italic) is cited from existing requirement document NS-R-3.

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America			Date: 27 September 2011				
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		insurmountable difficulties for the design and the implementation of a physical protection system, along with offsite security emergency response for defense-in-depth, shall be confirmed before a construction license or early site permit is granted.	<p>it shall 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."</p> <p>The statement is less than adequate to establish similar criteria for security that address the consideration for the design of a physical protection system for protecting a nuclear installation and the defense-in-depth for response for addressing uncertainties (i.e., the probability of a physical protection system, similar to safety systems, does not provide 100% certainties for success and as such defense-in-depth must be provided to address uncertainties).</p>				The guidelines cannot change the valid requirement document NS-R-3. Could be considered in the revision of NS-R-3 that will start in 2012)
6	3.18 / (b), 3	Define "capable fault"	It is defined later on P. 24. Should be defined when used first.			x	Again – this paragraphs are cited from NS-R-3 (we can not change them as per IAEA editorial rules)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America		Date: 27 September 2011					
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
7	3.22 / 5 / Pg. 21	Define "reference site"		x			
8	4.4 (d) / Pg. 24	Tsunami hazard should be a separate line	Importance	x			
9	4.4 (i) / Pg. 25	Geotechnical hazards such as slope instability, soil liquefaction, landslides, rock fall, permafrost, erosion processes, subsidence, uplift, and collapse	Uplift and collapse are two separate hazards.	x			
10	4.4 (i) / 2	Geotechnical hazards such as slope instability, soil liquefaction, landslides, rock fall, permafrost, erosion processes, subsidence, uplift, and collapse	Uplift and collapse are two separate hazards.			x	Same as 9
11	4.5 (a) (i) / P. 25	Delete "forests."	Not clear why "forests" are considered to be human induced hazard.	x			
12	4.5 (a) (iv)	Suggest adding: (iv) Commercial munitions plants	Item not addressed	x			
13	4.7	Add – An analysis of time should be required to evacuate various sectors and distances within a certain radius of each NPP, such as the area within a 16-km radius.	This analysis would provide a preview of potential protective action decision-makers of the time required to evacuate areas around the plant, as well as identify physical characteristics unique to the proposed site that could pose a significant impediment to the development of EP.			x	No analysis should be conducted during siting stage (site survey and screening). Confirmatory analysis has to be conducted later during site characterization stage.
14	4.9	Remove Criteria (c) and (d), as they are specific criteria for the design of a	CRITERIA RELATED TO PROTECTION AGAINST	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America			Date: 27 September 2011				
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		<p>physical protection system and are not siting criteria.</p> <p>Remove Criteria (b). Criterion (b) is a desirable siting condition for a design of a physical protection system, where the component of detection and assessment based on criteria (b) provide advantage for having clear lines of sight from all directions for early detection and assessment to initiate security response.</p> <p>Criteria (a) do not apply to sabotage, in which the potential threat can be independent of locations. Criteria (a) also assume a probability for potential threat (e.g., low, moderate, or high), where the design of the protection against sabotage in order to be successful must assume a conditional risk with the probability of one, regardless of the potential threat.</p> <p>Criteria (e) should considered in context of safety/security interface, specifically the DBT impact the balance for readily available and capabilities for offsite security and integrated safety/security response for defense-in-depth.</p>	<p>SABOTAGE, Section 4.9 stated that <i>"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 is not preferably located near to an area or a facility with high potential threat. (b) It is preferable to locate a site not having clear view of sight from all directions. (c) The access to the site should be restricted to a minimum number required for safety and operational considerations. (d) Site characteristics should be such that the ultimate heat sink, if any is not readily accessible to unauthorized personnel. (e) The site should be away from the population centers and public transportation routes."</i></p> <p>The criterion indicated does not appear to have been</p>				

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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America				Date: 27 September 2011			
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			evaluated or consider from the perspective of the design of a physical protection system or security.				
15	4.9	Suggest adding: (f) The site is sufficient in size for the establishment of security boundaries (e.g. owner controlled area, protected area and vital areas) having enough spatial distance between each boundary to ensure adequate separation for the implementation of associated security measures	Adequate spatial separation between security boundaries supports the implementation of additional security measures such a physical barriers which provide delay and enhance protective strategy response capabilities.	x			
16	4.9	Suggest adding: (g) The site is also sufficient in size to accommodate the installation of security equipment and measures such as physical barriers, protected area perimeter isolation zones, protected area perimeter intrusion detection and assessment equipment, vehicle search areas (sally ports), and the implementation of a physical protection program and protective strategy.	Ensuring the site is sufficient in size to allow for the proper installation of physical security equipment and the effective implementation of physical barriers that provide distance and delay in support of a site protective strategy is a significant factor in the effectiveness of the site's protective posture.	x			
17	4.9	Suggest adding: (h) The site characteristics that may require measures in order to control approaches to the facility (e.g., barge slips within the OCA, main access road from OCA to PA, transportation routes, cliffs, depressions, hills, mounds, open	Ensuring that site characteristics and terrain features that may provide an approach to the facility are addressed and evaluated for proper control and management supports	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America			Date: 27 September 2011				
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		waterways, and roadway or railroad that penetrate the OCA boundary)	the effectiveness of the site's protective posture.				
18	4.9	Suggest adding: (i) The evaluation of site characteristics (location, size and proposed site layout) for potential negative impacts between safety and security, "Safety/Security Interface." This criterion should address the identification of any potential conflicts that the proposed physical protection program and plant operational programs may pose to each other (including the installation, location, and configuration of proposed structures systems and components).	Evaluating the site for potential impacts between safety and security during site selection can assist in preventing and resolving significant issues that may have a negative impact on either security or safety prior to the construction phase.	x			
19	4.9	Suggest adding: (j) Identifying and addressing (re-routing, eliminating, or protecting) existing culverts or unattended openings such as underground pathways (e.g. irrigation ditches, water drainage piping and systems, etc.) that extend from outside to inside the proposed protected area boundary or power block location.	Existing culverts or unattended openings such as underground pathways that extend from outside to inside a proposed protected area or power block location provide the potential for unauthorized, and undetected access into the protected area and should be evaluated for re-routing, elimination or the implementation of protective measures if maintained,	x			
20	4.10	Provide clarification of why criteria may be "generally discretionary." Describe the appropriate standards,	Section 4.10. The criteria related to protection against sabotage used in the siting process indicated that they			x	Discretionary (for site selection only) means that these criteria

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America			Date: 27 September 2011				
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		criteria, or guidance that should be applied for discretionary vs. exclusionary.	are generally discretionary and are also used for ranking purposes. Descriptions for application of discretionary criteria should be provided for clarity and consistency of applying the proposed standard.				may not exclude a site (like fault displacement for which no engineering protective measures are available) since security measures are generally available and can be implemented to overcome potential threads. However the demand of security measures may impact the cost that should be considered in the ranking process.
21	4.12	Suggest adding: (j) Terrorist threat environment for proposed site location	Item not addressed	x			
22	4.12	Suggest adding: (k) Law enforcement capabilities for proposed site location	Item not addressed	x			
23	4.12	Provide, in the examples, specific aspect related to availability of offsite law enforcements to aid and respond to safety/security events. Consider specific examples of aspects to be considered not directly related to safety for DBT initiated events.	Section 4.12. stated that <i>"Some examples of aspects to be considered that are not directly safety related include (but is not necessarily limited to) the following:</i> <i>(a) Topography; (b) Availability and access</i>	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America			Date: 27 September 2011				
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			<p><i>conditions to condenser cooling water; (c) Transport routes and communication networks; (d) Proximity to load centre's; (e) Non-radiological environmental impact including ecological considerations (f) Socio-economic aspects including public acceptance; (g) Land use planning; (h) Aboriginal considerations; (i) Power Supply"</i></p> <p>The criteria stated above do not consider safety/security interface. The availability of off site security and integrated safety/security response to re-establish security posture prior to safety actions is significant to the success of mitigating and recovery from DBT initiated events.</p>				
24	5.4 / 4 / Pg.28	Delete phrase on global warming.	Not clear how one can consider effect of global warming.	x	Global Warming was replaced with Climate Change (consistend with DS417)		
25	5.7 / 1 /	Add word "transparent" after word		x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America			Date: 27 September 2011				
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	Pg.28	"systematic"					
26	5.8 (a) / Pg.28	(a) Hydrogeologic database.	There is no provision for the consideration of ground water or aquifer information in general in this document – ground water should be included in the database and in the text discussion. Ground water and aquifers seem to be an afterthought, for example, the "EXAMPLE OF ATTRIBUTES CONSIDERED IN SITING"/ "External Natural Hazards" section lists ground water as an example (page 53, II.6, iii) Ground Water); however, neither ground water nor aquifers are included or discussed in the document.	x			
27	5.8 (i)	Clarify whether the human induced events database includes regional and locality data on threat information, criminal activities, militias, gangs, organized crime, etc., from which the risks of insider threat may be assessed in design of a physical protection system that include access authorization.	Section 5.8 stated the following: <i>"databases should be established for the siting process and is further elaborated in Appendix-A: . . . (i) Human induced events database."</i> Human induced events database should include security significant information for			x	Human induced events is as per IAEA Safety Guide NS-G-3.1 and is illustrated in Appendix A..

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America			Date: 27 September 2011				
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
			consideration in the siting process and evaluations.				
28	5.8 (k) / Pg.28	Add "Tsunami database"				x	It is including in costal flooding DB (DS417)
29	5.13 (d) / Pg.30	Delete "Possibly"	Estimate of liquefaction potential should be performed.			x	
30	6.7 (b) / Pg.32	Replace word "generic" with "preliminary" Delete footnote 4.	It is not clear how one can use generic database and not site and plant specific design to get probabilistic safety assessment.	x			
31	Appx A, 3 / 6 / Pg.38	Replace word "size" with "radius"	Zone should be a circle with the site in the center.	x			
32	Appx A, 6. / 1 / Pg.39	Ground motion site specific response spectra to be enveloped by the plant design response spectrum.	Existing text "occur with very low probability over its service period" is not specific and clear.			x	At site selection stage no detailed Seismic Hazard Assessment suppose to be conducted. Just estimates of ground motion parameters (e.g, PGA) are expected to be used in ranking process for site selection purpose.
33	Appx A, 11. / 4 / Pg. 40	Last phrase of the paragraph should clarify what "near" means, e.g., 1 Km, 5 km?	Should be more specific.	x			
34	Annex I, Table I-1 / Pg 49	This table needs a QA/QC review – there are unexplained dual check marks in many of the columns and some of the text entries are unreadable.	Confusing.	x			
35	Annex II.6.2.vi/2	Slope instability, landslides	Makes this list consistent with Section 4.4.	x			
36	Annex	Expansion, uplift	Added comma between	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: United States of America				Date: 2011-10-10			
Country/Organization: United States of America			Date: 27 September 2011				
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
	II.6.2.vi/9		expansion and uplift (editorial).				

Comments Resolution: DS 433 “ Safety Aspects in Siting for Nuclear Installation”

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer Luigi Noviello, Gerd Bassing Page.1 of 2 Country/Organization: European Nuclear Installations Safety Standards (ENISS) Date: September 2011				Date: 2011-10-10			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Table II.1 point 13	10 Km from sea or ocean shore line or 5 meters above estimated maximum tsunami	This screening criterion of 50 meters above estimated maximum tsunami would cause substantial increase of energy cost due to condenser cooling water pumping needs			x	Screening means that over this elevation tsunami can be ignored without further analysis; is not a mandatory conditions. Lower elevations should be supported by hazard study.
2	Table II.1 point 22	In case the screening values given in table II-2 points 2 – 5 are not satisfied, it is to be demonstrated that thethe site deems to be unsuitable if the annual frequency of aircraft crash at site is greater than 10 ⁻⁷ but if the installation is designed from it's inception to resist airplane crash	There is a tendency from many Safety Authorities to request resistance to airplane crash either accidental or voluntary.	x	Sentence deleted.		

3	II.24 Radiological impact assessment	Minimum area to be covered from the center of the installation for radiological impact assessment should be determined on the basis of the envelope of the envisaged technologies.	1. The US NRC criterion cannot be automatically applied to new installation that may have or may have been designed for a limited radiological impact . 2. Need to be consistent with 3.18(B)			x	The Annex II presents only examples of MSs practice. Annex is not mandatory.
4	EMERGENCY MANAGEMENT PROCEDURE	Replace systematically “ procedure” with plan Revise numbering of this and following sections . First should be II.26	To be consistent with current practice. Content as stated is not only procedures.	x			
5	ANNEX III COMPARISON AND RANKING OF CANDIDATE SITES	DELETTE THIS ANNEX	As experience shows and as the laws of many Countries impose when there are more possible sites the final choice will be mainly socio-political not economical In any case the methodology proposed seems to be very theoretical and difficult to apply since no one would have the required data on installation costs differentials at a siting stage when, eventually, the siting is still being done , as stated in previous parts of the draft, on an “ envelope of technologies”			x	Annex III is not mandatory. Provides only an example. This was requested by MSs during TM from July 2010.

TITLE : DS 433 Safety Aspects in Siting for Nuclear Installations – Draft 00.09 15/08/2011

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.			IAEA should confirm that draft has been reviewed in the light of lessons learned (as today) of the Fukushima accident		The draft has been reviewed based on Lessons Learned so far from Fukushima Accident (ISSC consulted experts from Fact Finding Missions at Fukushima site)		
2.	1.4	where external hazards are dominant and <u>extensive</u> designed safety measures would be necessary for site utilization	Clarification (safety measures are always necessary, but are sometimes easy to implement)			x	Proposed change reduces the considerations of safety aspects only to hazards. Suitability of a site include demonstration of feasibility of implementation of emergency plan also.
3.	2.5	All the site related activities, involving confirmatory and monitoring work, are taken up in the pre-operational stage <u>and are incorporated in, after the approval of the SER by the regulatory authority. With the approval of the Final Safety Analysis Report (FSAR) of the nuclear installation, the site evaluation continues during the operational stage starts</u>	Approval of SER is not a systematic step.	x			
4.	2.6/2	Regulatory Authority <u>body</u>	To be consistent with IAEA glossary	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
5.	2.7 (c)	the site related design basis parameters have been appropriately accounted for, <u>in particular through the nuclear installation design features and measures for site protection and administrative procedures.</u>	Clarification. Not an exhaustive list of provisions....	x			
6.	3.1/2	Its site characteristics	Clarification	x			
7.	3.2/2	The process systematically should <u>systematically</u> apply a series	Alternative wording	x			
8.	3.3 (3)	that would preclude the construction and operation of a <u>the</u> nuclear installation	Clarification : site selection is related to a specific nuclear installation	x			
9.	3.3	The first two steps fall into the first stage, while the third one in the second stage of siting process.	Superfluous (duplicates information already presented in Fig 3)	x			
10.	3.4/3	May lead to its site exclusion.	Clarification	x			
11.	3.6/2	Site <u>ing</u> criteria are used to evaluate	For consistency with first sentence of 3.6	x			
12.	3.10	The screening and ranking criteria consist of both safety related as well as non-safety related <u>criteria</u> .	Clarification	x			
13.	3.11/2	Screening by exclusion criteria <u>enables</u> indicates that sites with unfavourable characteristics should to be excluded from <u>further</u> consideration	Alternative wording	x			
14.	3.13	Screening out based on an arbitrary safety criterion may discard a site having otherwise favourable safety qualities and finally result in the choice of a site that may be less ‘safe’ than the one that has been discarded.	Superfluous	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
15.	3.14	Discretionary criteria should be redefined to: <ul style="list-style-type: none">- decrease the number of possible candidate sites if the number of these is too large to conduct the exercise of comparison and ranking;- It should also be used in the reverse case in which increase the the number of candidate sites <u>if this number</u> is too small or none.	Create a bullet list for better clarity	x			
16.	3.15	It is generally advantageous if candidate sites are dispersed to two or more regions with different attributes, <u>this</u> would prevent the eventual <u>later</u> elimination of all the candidate sites due to a common and regional shortcoming.	Clarification	x			
17.	3.20	Ranking criteria is <u>are</u> generally developed		x			
18.	3.23/6	The siting organization can then use this <u>Such information can be used</u> to either screen	Avoid mentioning the “siting organization”	x			
19.	3.23/9	the siting organization should examine the bases and credibility of the vendors’ generic information, particularly in first-of-a-kind designs, <u>should be assessed</u> .	Avoid mentioning the “siting organization”	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
20.	3.25	There are several issues which need special attention, when sites: <ul style="list-style-type: none">- 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;- that have been discontinued are re-considered for a new nuclear installation project.	Create a bullet list for better clarity	x			
21.	3.26/4	composite manner. Considerations for such cases	Typo	x			
22.	3.26 (e)	Some hazardous events, e.g. loss of grid supplies, and most external hazards can initiate common cause faults <u>on all the nuclear installations at the site</u> , and the effects	clarification	x			
23.	3.26 (f) Normal op.	<i>Normal operational doses to members of the public:</i> It is to be expected that normal operations doses to members of the public may increase since the new facility will form an additional source term. Whether this new contribution is significant and requires additional protection over what would be expected if the new facility was on an isolated site should be established.	Superfluous	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
24.	3.26 (f) Normal op.	<u>Normal operation and protection of the environment: It is to be expected that radioactivity level in the environment due to normal operations may increase since the new facility will form an additional source term. Whether this new contribution requires additional environmental protection measures over what would be expected if the new facility was on an isolated site should be established.</u>	Add issue on environmental protection	x			
25.	3.26 (f) accident	Accident condition doses and risks: The new facility provides its own contribution to accident condition doses and risks to members of the public. Where the accidents from each facility are independent, then although the net combined contribution to risk should be established it is likely to be small. However, where the accident initiator is a common cause event ... then both risks and doses to members of the public should be assessed considering that all facilities at the site are simultaneously challenged outside the site may be higher for the combined site.	The initial wording make hypothesis on the existing nuclear installations already existing at the site and the new installation considered : the level of risks due to the existing installation may be very different (very low of very high) compared to the one generated by the new facility...	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
26.	3.26 (f) accident	—Local regulatory requirements should be followed in determining site boundary and dose acceptance criteria— —Emergency preparedness planning— (ii) Where the new facility forms a separate site immediately adjacent, or very close to, an existing site, then it is to be expected that the physical effects to people outside the combined sites will be similar to those noted above. Additional protective measures may still be required from one or both sites to keep doses and risks as low as reasonably achievable. (iii) Doses and risks to workers on the site(s) should also be considered in terms of the combinations effects of both installations, and additional precautions taken if appropriate to keep doses and risks as low as reasonably achievable.	Superfluous / unclear			x	Adjacent sites situation should be properly considered in respect to the dose risks.
27.	4.1	• Criteria related to protection against <u>malevolent acts sabotage</u> , and	Sabotage is restrictive	x			
28.	4.4 (k)		Important recommendation in relation to the Fukushima accident. Additional guidance might be welcomed...		No action requires.		
29.	4.5 (a)	Add a bullet : <u>(iv) pipelines</u>	Pipelines are listed in the "mobile" source. A pipeline is stationary...			x	This is according to IAEA NS-G-3.1 (the concern is related to what is traveling through pipeline)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
30.	4.5 (b) (i)	(i) Railway trains and wagons, road vehicles, ships, barges, pipelines	See previous commet			x	This is according to IAEA NS-G-3.1 (the concern is related to what is traveling through pipeline)
31.	4.5 (b) (ii)	(ii) Airport zones <u>(civil and military)</u>	To be consistent with 4.5 (c) (iii)	x			
32.	4.6 (e)	(e) Common cause failure due to external hazards for multi-unit sites.	Although true, does not fit in 4.6. Already covered in 3.26 (f)			x	3.26 deals with siting of new nuclear installations at existing sites; does not cover multi-unit sites.
33.	Title before 4.9	CRITERIA RELATED TO PROTECTION AGAINST SABOTAGE MALEVOLENT ACTS	Sabotage is restrictive	x			
34.	4.9	Following criteria should be considered to site a nuclear installation in a location from the consideration of protection against <u>malevolent acts</u> sabotage .	Sabotage is restrictive	x			
35.	4.9	(c) The access to the site should be restricted to a minimum number required for safety and operational considerations. (d) Site characteristics should be such that the ultimate heat sink , if any is not readily accessible to unauthorized personnel. (e) The site should be away from the population centres and public transportation routes.	(c) and (d) are not siting issues (operational issues) (e) is not a key issue from a malevolent act perspective. Furthermore, access roads are usually needed to enable construction and operation....	x	A to e deleted		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
36.	4.11	4.11. OTHER CRITERIA 4.11 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 <u>malevolent acts sabotage</u> . They need to be considered together with the nuclear safety related aspects related to protection against <u>malevolent acts sabotage</u> in an interactive manner especially in the ranking of the candidate sites. See document [11].	Sabotage is restrictive	x			
37.	5.14	The judgments made at this stage should be sufficiently robust so that there is a high degree of confidence that they will not be undermined by further work. There should be high confidence therefore, i.e.: that new data will not be discovered that would overturn site selection judgments, and more refined analyses should <u>are</u> not expected to cast doubt on them.		x			
38.	6.3	which it is assumed that the entire radioactive inventory of the installation is released by the potential external hazard initiated an accident.	Superfluous	x			
39.	6.4	Delete 6.4	Superfluous	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
40.	6.5 (g)	(g) The need for active safety systems and/or operator actions for the prevention of accidents and for mitigation of the consequences of accidents; characteristics of engineered safety features for the prevention	Superfluous	x			
41.	6.5 (h)	Or of the engineered safety features		x			
42.	6.7 (a)	(a) The generic preliminary safety analysis report for the installation, <u>if one is available</u> , which should be the primary source of information;	To be consistent with 6.7 (b), as such <i>generic</i> PSAR may not exist	x			
43.	7.1	This is necessary to control the effectiveness of the execution of the siting process.	Superfluous	x			
44.	7.2	The management system should cover the organization, planning, work control, personnel qualification and training, verification and documentation for the activities to <u>ensure adequate performance of these tasks</u> that the required quality is achieved.	Quality is not the only concern	x			
45.	7.8/1	When developing the <u>part of management system dealing with the siting process</u> , the following	The management system is broader than siting process...	x			
46.	Title before 7.9	SPECIFIC RECOMMENDATIONS FOR A SITING PROJECT ORGANIZATION	Superfluous	x			
47.	7.9	The work plan should convey the complete set of general requirements <u>for the nuclear installation</u> (such as total power generation of the NPP project),	Clarification	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
48.	Appendix A	Transform Appendix A into an annex	Very detailed guidance. Alternative content may be acceptable.			x	Appendix is part of the Safety Guide since Annex is not part of the main text; Annex presents illustrative examples only.
49.	Appendix A 34	Add “electromagnetic interference” in second bullet list	To be consistent with table I.1		x		
50.	Annex I – table I.1	In the non-safety criteria, add “Land-use plan”		x			
51.	Annex II – II.5	i) Plant property line with co-ordinate of reactor building ii) Plant boundary iii) Site boundary or exclusion zone; zones demarcating 5km, 16km, (>) 25 km, and 80km from centre of reactors [II-1, II-2, II-3]. iv) Population distribution and location of existing industrial, commercial, institutional, recreational and residential facilities including projections for the lifetime of the nuclear power plant v) Scale of map vi) True North	Superfluous, may not be relevant for some nuclear installations (reactor building...)	x			
52.	Annex II – II.7	2. vi) Transportation of fresh and spent fuel <u>and other radioactive material</u>	Not to be limited to fuel (may not be relevant for all nuclear installations)	x			
53.	Annex II – II.8	1 ii) Rain <u>and other precipitations</u>	Snow...	x			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page		Date: 2011-10-10			
Country/Organization: France /ASN		Date: 15/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
54.	Annex II – II.8	6 Management of the Radioactivity waste <u>radioactive release</u> during accident conditions i) <u>Radioactive liquid release</u> waste	More adequate wording. Consistency with II.8.6 ii)			x	This deals with waste management not releases. (is result of comments received from WASSC)
55.	Annex II - II.9	5 <u>Emergency zones outside the nuclear installation boundary</u> Population considerations within i) Exclusion zone (population in this zone is plant personnel) ii) Sterilized or low population zone iii) Emergency planning zone iv) Radiation monitoring Zone	More general wording	x			
56.	II.11 to II.28	Delete II.11 to II.28	Too much detailed, may not be relevant depending on the type of nuclear installation... May be transferred to tecdoc...			x	These are just illustrative examples based on practice from different MSs (not part of SG) – Such examples have been requested by the MSs (TM July 2010)
		/					

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

COMMENTS BY REVIEWER	RESOLUTION
Reviewer: contact: Sara Caria, Paolo Contri, Gerd Bassing Country/Organization: European Nuclear Installations Safety Standard (ENISS) Date: 2011-09-26	Page 1 of 2 Date: 2011-10-10

Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	Agreement should be shown among safety relevant milestones, as satisfied in the IAEA SGs, the text and the figure 1, identifying the safety and non safety related phases					
2	General	Justifying the objective of the grading in terms of definition of the siting criteria and relevant					
3	2.4/line 1	<i>Site evaluation is a process that relies upon four stage, the development of the first two being independent from the choice of technology to be installed. In particular, the process extends from.....</i>	To make the concept of the independence of the siting from the technology clearer			x	Siting includes Suite Survey and site selection. Site Evaluation is a distinct stage. Siting process is well illustrated. Detailed site evaluation is out of scope of DS433.
4	3.3which has less favorable attributes than the other. <i>In case a site survey has been conducted in the Country, those results are part of the safety arguments behind the site selection and therefore should be documented.</i> <i>In case a site survey process has not</i>	To make clear how to proceed to perform a suitable site choice.			x	The paragraph was deleted (following comments from other MS)

Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
		<i>been systematically followed, the same arguments should be moved to the site evaluation phase and duly documented as part of the site licensing.</i>					
5	5.1	<i>The whole site selection should rely upon a grading data process. In particular, the site survey phase should be based on information and data principally collected from existing sources such as..... For those sites that could not satisfy all the screening criteria but are likely to be considered them as potential candidate sites, additional investigation could be required already at this level. The site selection, instead, should involve complete site investigation campaign. The input information/data.....</i>	To make the concept about the data grading process clearer		x		Site Selection does not require full characterization; Requires only demonstration of site suitability.

DS433 Safety Aspects in Siting for Nuclear installations, date 2011-08-01

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: M-L Järvinen.....		Page.... of....		Date: 2011-10-10			
Country/Organization: STUK		Date: 2011-09-27					
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	This SG covers the site survey and selection stages. Lessons learnt from Fukushima accident needs to be addressed in later stages.
2	General	The safety guide should make reference to the new requirements document NS-R-1 approved in the CSS.	Table I-2 makes reference to design safety guides.	X			
3	General	The siting requirements document NS-R-3 should be updated due to the approval of the new NS-R-1.		X			Updating planned in 2012.
5	General	The consequential event aspects should be brought into the guide.					Addressed as concerned Site Selection process.
6	General	The events influencing several units on the same site should be considered.					Addressed in the draft SG.
	General	The siting of a new unit to an old site should be dealt with.	Fig.2 presents the outcome of the siting and site evaluation processes. If a new unit is to be built to an old site instructions to handle the case are needed.			x	Addressed in the Draft SG.

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: M-L Järvinen.....		Page.... of....		Date: 2011-10-10			
Country/Organization: STUK		Date: 2011-09-27					
	3.10	The screening as well as ranking criteria consist of both safety related and other criteria. Screening and ranking criteria are further elaborated in Annex I.	The criteria such as availability of cooling water are safety related in spite of the fact that cooling can be made in several ways. Also other topics in Table I-1 under non-safety have relation to the safety.			x	Safety and non-Safety Criteria is adequate.

Comments Resolution: Safety Aspects in Siting for Nuclear Installation, DS433 (2011-08-15)

COMMENTS BY REVIEWER Reviewer: S. Maki Country/Organization: Japan/ NISA				RESOLUTION 2011-10-10			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
1	1.16/8	Add explanation of appendix A	Description of Appendix A is missing.	X			
2	1.16	Add following sentence to 1.16. Proposed text; It should be noticed that numerical values shown in ANNEX are only examples used in a country or in an organization. These values should be determined taking into account the individual characteristics of the potential site area.	Although annex is not a part of the guide, ANNEX II has big influence to MCs. The meaning of screening values shown in ANNEX should be described in main body of this guide, maybe in 1.16.		Appropriate wording would be used.		The wording ‘It should be noticed’ is not appropriate
3	Figure 1	SITING → SITING PROCESS	Same words should be used in Fig. 1 and 2. The word of “site evaluation” was reflected by former comment but not “siting (in Fig.1)/siting process (in Fig.2)” . According to the description in Sec.2.3, the wording of Fig.1 may be “siting process”.			X	Siting and site evaluation process has been used in both figures.

4	3.3/13	The first two steps fall into the <u>first stage</u> , while the third one in the <u>second stage</u> of siting process. →The first two steps fall into the <u>site survey stage</u> , while the third one in the <u>site selection stage</u> of siting process.	To avoid obscurity words and to keep consistency with Fig.3.	X			
5	3.4/3 3.5/2	preferred sites → preferred candidate sites	"A set of preferred sites" in Sec. 3.4 will likely point to the second frame from the bottom of Figure 3, if so the terms should be "a set of preferred candidate sites" "the preferred sites" in Sec.3.5 will likely point to the second frame from the bottom of Figure 3, if so the terms should be "a set of preferred candidate sites"	X			
6	4.9 (e)	(e) The site should be away from the population center and <u>public transportation routes</u> .	Please explain the intention of excluding 'public transportation routes'.			X	Avoid hazards from human induced events. However, all details are not provided in this section

7	Annex II Table II-1/3	Screening Value for Capable Fault:8km and Description in Remarks: Exclusion → Discretionary	Of course directly on a surface fault is Exclusion, but 8km is not. Adequacy of siting to near faults should be evaluated by careful study of the fault size, activity and then analyzing effect on the site by using fault model etc., not by distance only. So, the remarks of this term should be “discretionary” at least. (The referred document only says that “it is <u>prudent</u> to select an alternative site”.)			X	Annex is not part of SG. It only provides examples of MSs.
9	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 →rewrite based on IAEA’s Emergency Plan Criteria”	Regarding emergency plans, IAEA has a criteria “GS-R-2 Preparedness and Response for a Nuclear or Radiological Emergency”. Sec.II-24 should be described based on IAEA guide such as Section 4.58 of the criteria.			X	Annex is not part of SG. It only provides examples of MSs.

10	Annex II.28.3).ii)	ii) Radiation doses (<u>intervention levels and derived intervention levels</u>), domain and counter measures → ii) Radiation doses(<u>Generic criteria and Operational interventional levels(OILs)</u>), domain and counter measures	There are IAEA rules in disaster prevention and safety. According the IAEA rule, “intervention levels” is one of the Generic criteria, and “derived intervention levels is “Operational intervention levels” These words should be used.			X	Annex is not part of SG. It only provides examples of MSs.
11	Annex III	Delete Annex III.	Annex III is evaluating in terms of cost of each evaluation item. This guide is a guideline to select site in safety aspects, so evaluation by costs is not adequate.			X	Annex is not part of SG. It only provides an example.

Title: Safety Aspects in Siting for Nuclear Installations, DS433 (2011-08-15Draft)
(Editorial)

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: S. Maki		Page 1 of 2		2011-10-10			
Country/Organization: Japan/NISA		Date:28/09/2011					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
1	3.18	Revise to “The site safety requirements cited in Ref-1 <i>are</i> the primary source for establishing the screening criteria to the siting process.”	Editorial	X			
2	3.26 (f)	Add paragraph number (i).	Editorial	X			
3	4.11	“OTHER CRITERIA” should be a section title. Also, revise it to “NON-SAFETY RELATED CRITERIA” according to the classification in paragraph 4.1.	Editorial	X			
4	5.9	Remove a redundant period in “Not all databases need to be considered for every criterion..”	Editorial	X			
5	6.3	Remove a quotation mark in “unless those factors are included in the final site selection acceptance criteria”.”	Editorial	X			
6	7.7	Paragraph number 7.7 is missing.	Editorial	X			
7	REFERENCE [15]	Remove a redundant “[15]”.	Editorial	X			
8	APPENDIX-A 2.	Correct “Section .0.” appropriately.	Editorial	X			
9	APPENDIX-A 12.	Revise to “may affect the safe operation of nuclear <i>installations</i> . <i>These</i> should be evaluated for potential and candidate sites”.	Editorial	X			
10	ANNEX II II.22	Correct to “In case the screening value given in <i>Table II-1</i> is not satisfied”.	Editorial	X			

11	REFERENCE TO ANNEX_III	Correct to “REFERENCE TO <u>ANNEX II</u> ”.	Editorial	X			
12	ANNEX III III.5/1	<u>Let's</u> design parameters→ <u>Let</u> design parameters	Editorial			X	Language already modified.

TITLE

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Chang-Bock Lim and Myunghyun Noh, S.H. Lee, Kyun-Tae Kim Page.... of.... Country/Organization: Korea/KINS Date: 2011-09-20				Date: 2011-10-10			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Appendix A.3.	The extent for the geological survey should be consistent with that proposed in IAEA SG-NS-G-3.3.	The regional extent of the geological investigation in IAEA SG-NS-G-3.3 is the area with a radius of 150 km from the reactor. The size of the region to be studied for the geological database in this safety guide is 100~300 km.			x	NS-G-3-3 was replaced by SSG-9. SSG-9 applies to detailed site evaluation (after selection process is completed)
2	Annex II. Table II-1. Sr. No. 1.	The distance from a capable fault as an exclusion criterion needs to be alleviated. It is more reasonable to restrict the capable fault to the fault which could seriously affect the safety of the NPPs. The definition and features of the fault depend on the geological and tectonical characteristics of each country.	The screening value for the distance from a capable fault is too severe to be applied. In order to evaluate the safety of NPPs associated with the capable fault, we should also consider the detailed characteristics of the fault (length, width, displacement and so on).			x	In selection process is desirable to stay away of any capable fault. These details investigations and seismic hazard re-assessment are needed if a capable fault is detected nearby an operating NPP/NI site.
3	Annex II. Table II-1.	It may be better to leave each country's regulations related to the	The screening value is too severe to be applied.			x	Please note that Appendix II is not

	Sr. No. 10.	cultural assets.					mandatory (is not part of the SG). Just present examples and practice from MSs.
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"Safety Aspects in Siting for Nuclear Installations" DS 433

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Country/Organization: Ukraine/SSTC NRS		Page 1 of 2 Date: 30.09.11		Date: 2011-10-10			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	<p>Para 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 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.</p> <p>III.4 Comparisons between the candidate sites are done on a reference parameter. One example of such</p>		<p>As it may be seen from Annex III, the site selection based on potential for initial events is proposed to be done by means of cost comparison (namely, construction costs and operational expenses).</p> <p>Based on the experts' opinion: <i>These criteria are not sufficient enough</i> since they do not take into account consequences of initiating events (including their combination as it occurred at Fukushima NPP) and remediation costs.</p>			x	Annex III provides just an example of Ranking (not mandatory to be followed).

	parameter is cost-differential. Cost-differential is the difference in the cost of NPP of a standard design at different sites. Ideally, the lifecycle cost i.e. cost for construction (including that of engineering), operation, transmission including losses, and decommissioning is to be considered. However, consideration of construction, operating and transmission cost is sufficient.						
2.	<p>Para 4.4. The first set of criteria is related to the potential impact of natural hazards on the safety of the nuclear installation. In this context, the following natural hazards should be considered:</p> <p>II.8 Radiological Impact</p>	<p>To be added to the list</p> <p><i>Effects of icing on transmission lines</i></p> <p>Dispersion of radioactive material through</p> <p>i) Atmosphere</p> <p>ii) Sub-surface water</p> <p>iii) Surface water</p> <p>iiii) Large water bodies, large rivers and seas</p>	<p>“Icing” event is considered in PSA for Ukrainian NPPs, since it might cause the initial event “Loss of power supply” and has impact on safety.</p> <p>The propagation of contamination in rivers and seas (large water bodies) differs from the similar processes in surface and underground waters.</p>			x	<p>Is included in other extreme meteorological events</p> <p>I agree. However those criteria should be considered. What is the comment?</p>

DS433

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Waddah ALHANAI Page 1 of 2 Country/Organization: UAE/FANR Date: May 31, 2011				Date: 2011-10-10			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	Table of Contents gives page numbers to the sections and subsections, but the report itself has no page numbers	Need page numbering	X			
2	References	NS-G-3.5 is not referenced. "Flood Hazard for Nuclear Power Plants on Coastal and River Sites", 2003.	NS-G-3.5 should be referenced. The Fukushima accident is an example of flood hazard on coastal sites.			X	Superseded by DS417 (in publication)
3	Section 7	More details are needed for the specific requirements, recommendations and guidance on the Management System and quality assurance for a siting process; including codes and standards	The success of a siting process is fundamentally dependent on the management system used to provide the desired quality assurance of data collection, data quality control, data analysis and data interpretation, leading to knowledge-based decision making on site selection. Section 7,"Management System and Quality Assurance			X	More guidelines (not requirements) are given in ref 12 and 13.

			Requirements”, lies in 2 pages; with “General Recommendations” taking up half of the Section. No mention of the codes and standards to be used.				
4	Table of Contents	Annex I is not listed in the Table of Contents	Annex I exists, but is not listed in the Table of Contents			X	It is listed (check version of document you reviewed)
5	Section 1.4	“The first level is prevention and aims at decreasing the exposure to external hazards.”	Replace “decreasing” by “avoiding” or a synonym.			X	It is not possible to completely avoid exposure to all external events (e.g. earthquakes)
6	Section 1.11	“The data collected and the methods used for these few sites should be”	Insert “analysis” before “methods”			X	In Siting process (Site Survey and Screening) no analysis is performed
7	Figure 2	“SITING EVALUATION”	Replace “SITING EVALUATION” by “SITE EVALUATION”			X	There is no Siting Evaluation in Figure 2 (Check the version of the reviewed documents)
8	Bullet 9 in Section 3.18	Include lessons learnt from the Fukushima accident	The Fukushima accident was caused by the “loss of function of systems required for the removal of heat from the core ...”			X	This document deals with Siting and Site Selection process only. The document was reviewed from this point of view.
9	Bullet (g) in Section 4.4	“.....such as tornadoes, local phenomena such as sand storms.”	Should read “.....such as tornadoes, sand storms and dust storms.”	X			
10	Bullet (h)	“.....water; and lightning.”	Should read “.....water;	X			

11	in Section 4.4 Section 4.4	Add Bullet (j) Impact of concurrent or consecutive hazards/events	lightning and dense fog.” Fukushima accident was caused by the occurrence of two consecutive events: earthquake and Tsunami			X	It was included (Credible Combinations of events)
12	Section 4.5 (a) (i)	“Oil refineries, chemical plants, ...”	Should read “Oil and Gas operations (drilling, production, injection), oil refineries, chemical plants, ...”	X			
13	Section 4.12	Add the following bullets: (h) Economics (i) Future developments (j) Human Factors	These criteria are important in the site selection process.			X	4.12 is under Section dealing with Criteria related to protection against malevolent acts.
14	Section 5.2	“.....regional data presented in small scales (coarser data; data of low resolution) to local data presented in larger and larger scales (finer and finer data; data of higher and higher resolution).”	Should read as follows: “.....regional data presented in large scales (coarser data; data of low resolution) to local data presented in smaller and smaller scales (finer and finer data; data of higher and higher resolution).”	X			
15	Appendix A	Add at the end of Bullet 11: “Faults are almost always accompanied by fractures. Therefore, fracture characterization should/must be carried out; especially in the area under the proposed site.”	Fracture characterization results in estimating the hydraulic conductivity of the fractures (open or sealed)			X	Faults are not visible to the surface all the time (especially in areas with deep sediments).

16	Appendix A	Add the same as above!	Same as above!			X	Same as above!
17	Appendix A	Add to the end of Bullet 26 the second (last) statement in Bullet 25.	The extreme sea level must be determined for longer return periods; Fukushima accident is a reminder!	X			
18	Appendix A	Bullet 27: "This database provides information describing the river flooding characteristics of the proposed site"	Should read: "This database provides information describing the river flooding and storm water flash floods characteristics of the proposed site"	X			
19	Appendix A	Bullet (28) (a): "Regional and local maps of watercourse, rivers, lakes, streams, etc. and local site"	Should read: "Regional and local maps of watercourse, rivers, lakes, streams, and wadis, etc. and local site"	X			
20	Appendix A	Bullet (31) (a): "...wind speed, precipitation, etc."	Should read "...wind speed, precipitation, sand/dust storm sand particle sizes, etc."	X			
21	Appendix A	Bullet (31) (a): "...such as tornado, cyclone, ..."	Should read "...such as storms, tornado, cyclone, ..."	X			
22	Appendix A	Bullet (34). Add sub-bullet (f) "pollutants (air, surface, subsurface)"	Pollution presents a considerable hazard, especially if the site lies			X	This is not included in NS-G-3-1 should be addressed in EIA

			in a region of pollution-producing activities/events. Long-term forecast of pollution development/generation in the site area should be made.				since does not constitute a direct challenge to nuclear safety.
23	Appendix A	Bullet (36). Add sub-bullet (c) “oil and gas operations (drilling, production, injection, refining)”	Oil and gas operations (drilling, production, injection, refining) can affect the site or operation of an NPP in several ways.	X	Oil and Gas operation was added in bullet (b)		
24	Table I-1	Under “Flooding”	“Tsunami” in Column #2 should read “Tsunami/ Storm water flood/ flash flood”	X	It is covered in Costal (storm surges, waves, etc.)		
25	Table I-1	Under “Extreme Meteo events”, add “Sand/Dust Storm” in Column #2	Add “Sand/Dust Storm” in Column #2	X			
26	Table I-1	Under “Human-induced Events”	“Gas releases” in Column #2 should read “Gas Releases/Pollution”			X	This is not included in NS-G-3-1 should be addressed in EIA.
27	Table I-2	Under “Flooding” in Column #1	“Tsunami” in Column #2 should read “Tsunami/ Storm Water Flooding/ Flash Flood”			X	It is included in Costal Flood and ref .IAEA document.
28	Table I-2	Under “Extreme Meteo Events” in Column #1	Add in Column #2: “Sand/Dust Storm”			X	Included in DS417 (no need to go in details in this table)

29 30	Table I-2 Annex II	Under “Human-induced Events” Item II.6.2.ii.b “Precipitation”	Add “Pollution” Should read “Precipitation/ Flash Floods”			X	This is not included in NS-G-3-1 should be addressed in EIA
		Add to the items under II.6.2.ii “Fog and High Humidity”	Fog and humidity can affect NPP operation and maintenance. Combined with Sand Storm, humidity can cause “mud caking”, which in turn can affect the operation of electronic and electro- mechanical devices and equipment. Fog and humidity affect the dispersion of radioactive releases. Combined with sand/dust storm, the dispersion takes an even more complex nature that needs to be understood and evaluated.			X	Included in DS417 (no need to go in details in this table)
31	Annex II	Item II.6.2.vi.g “Collapse, subsidence or uplift”	Should read “Collapse, subsidence or uplift of the site surface”			X	To much details for this table intended to show correspondence between the criteria and IAEA Safety Standards.
32	Annex II	Add “Quality of the Cooling Water (freedom from foreign material, planktons, other marine life,etc.)” to the items under II.6.3	Debris, other foreign material, as well as organisms inhabiting the surface layer of a sea or lake consist of small drifting plants and			X	This is not a hazard – is typical for all sites and should be addressed in the design stage.

33	Annex II	<p>Add “Oil and gas operations (drilling, production, injection, refining)....etc.)” to the items under II.7.1 “Stationary Sources”</p> <p>Add “Industrial Plants and Operations” to the items under II.7.1 “Stationary Sources”</p>	<p>animals that can impede or even block the cooling water intake system.</p> <p>Oil and gas operations (drilling, production, injection, refining) can affect the site or operation of an NPP in several ways.</p> <p>Industrial plants and their operations can affect the site of an NPP during operation, maintenance, emergency, ...etc</p>	X			
34	Annex II	Add “Sand/Dust Storm” to the items under II.8.1 “Radiological Impact”	<p>Sand/Dust storms affect NPP during operation, emergency and maintenance. Combined with humidity, Sand Storms can cause “mud caking”, which in turn can affect the operation of electronic and electro-mechanical devices and equipment.</p> <p>Dust/Sand storm affect radiological dispersion. When sand/dust storm, the dispersion takes an even more complex nature that needs to be understood and</p>	X			

35	Annex II; Section II.11	Point #1 “Distance from capable fault” is missing a footnote	evaluated. Please add a footnote to explain “8.0 km”				Appendix II is not part of the Guides – presents examples from MSs. Is given Ref II-3 (RG 4.7)
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