

**Comments on:
DPP of DS 483 Severe Accident Management Programme for Nuclear Power Plants**

Note: Resolution of the Ukrainian comments added to the original version of the Table.

COMMENTS BY REVIEWER				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as	Rejected	Reason for modification/rejection
Reviewer: Canadian Nuclear Safety Commission		Country/Organization: Canada		Date: August 29, 2013			
1	Page 2, Section 4 “Objectives and Scope”	<p>We recommend to explicitly identify in the section describing the document scope, the following considerations:</p> <p>“This Safety Guide will address preparation, development, implementation and review of accident management programs, which will enhance the plant and personnel capability to respond to accidents. While the focus of the Guide is on the establishment of severe accident management, the recommendations given should give considerations to all types of event.</p> <p>The Safety guide will elaborate on the Defense in Depth considerations as applicable to the accident management and will consider use of the plant capabilities as well as the use of mobile emergency mitigating equipment”</p>	The proposed additions are reflective of the Fukushima lessons learned.		<p>“This ----- should give considerations to <u>all events considered credible on the basis of possible initiating events.</u></p> <p>The Safety guide will elaborate on the Defense in Depth --- as the use of mobile <u>or portable</u> emergency mitigating equipment”</p>		<p>Accepted: “all types of event” could be understood as including terrorist attacks explicitly so that it replace described in NS-G-2.15 in section at 3.1. “The preventive accident management guidance should address the full spectrum of credible beyond design basis accident events; that is, <u>all events considered credible on the basis of possible initiating events,</u> --“</p> <p>It is also described in Section 3.17 of NS-G-2.15 and add <i>portable</i> dependent on MS’s practices.</p>
2	Page 9, Preliminary	We recommend adding to the Table of Contents the following items	Consistent with Fukushima lessons learned	X			Accepted: Clarification.

	Table of Contents	In Section 2, add “Accident Management as a component of Defence in Depth” In Section 3, add “Multi-unit considerations” “Spent fuel pool accidents”					It was already described in NS-G-2.15 at Sections 1.4 and 2.3 on the concept of accident management with Defense in Depth. In Sections 2 and 3 of NS-G-2.15, multi unit plants and the potential damage of spent fuel both in the reactor vessel and in the spent fuel pool or in storage are also considered.
Reviewer: IRSN ASN		Country/Organization: FRANCE / IRSN ASN			Date: September 17, 2013		
1	Review committees		It is not obvious, considering the proposed table of content, to identify WASSC as a review committee. RASSC may also be relevant, considering radiation safety issues related to accident management.		Add RASSC (if necessary)		Accepted: Safety of Spent Fuel Management is responsible WASSC, RASSC is relevant more or less in terms of source term evaluation of accident management but it covers a few in the guide.
2	Para 3	Additional challenges are placed on cooling with <u>potentially</u> non-qualified sources, run-off of contaminated water, threats from the spent fuel cooling, and large-scale natural events at multi-unit sites. Shutdown conditions are also considered.	The use of qualified equipment should be favored...	X			Accepted: Clarification
3	Para 3, line 9	...where major safety functions such as control of reactivity, removal of heat from the core and from spent fuel,	Although the SAMP may have not been designed to handle a specific situation	X			Accepted: Clarification

		confinement of radioactive material and limitation of accidental radioactive releases <u>could be have been</u> lost, <u>thus corresponding items</u> and either must be repaired under difficult circumstances or must be replaced by portable equipment <u>or there must be ultimate items to fulfill these functions...</u>	(exceeding what was considered to develop SAMP), the purpose of SAMP is too maintain control over containment and limit radioactive releases.... Repair or portable equipment are not the only solution to fulfill these function, consistently with current DS 462.				
4	Para 4	The recommendations of this Safety Guide will be developed for severe accident management during all operating conditions for both reactor and spent fuel pool storage.	Too broaden the scope to dry storage (even if less challenging than pools)	X			Accepted: Compliance with IAEA Safety Glossary
5	Para 4	This guideline will also contain guidance on drills / exercises. It will give guidance on how such measures should be defined and how they should be executed to support harmonization of methods used by Member States.	Is harmonization a goal or is it effectiveness?				Explain: Harmonization is effectiveness.
6	Para 5	The following IAEA documents to be interfaced with revision of NS-G-2.15: <ul style="list-style-type: none"> ● Safety Assessment and Verification for Nuclear Facilities, No. GSR Part 4, IAEA, Vienna (2009) ● Safety of Nuclear Power Plants: Design, No. SSR 2/1, IAEA, Vienna (2012) ● Safety of Nuclear Power Plants: Commissioning and operation, No. SSR 2/2, IAEA, Vienna (2012) 	Why putting this paragraph as the following paragraph, listing safety standards to be taken into account, already identifies them	X			Accepted: Editorial correction
7	Para 5	● Preparedness and response for a	DS457 is enough (it				Accepted:

		nuclear or radiological emergency, IAEA Safety Standards Series No. GS-R-2, IAEA Vienna (2002); and <ul style="list-style-type: none"> Preparedness and Response for a Nuclear or Radiological Emergency, IAEA draft General Safety Requirements Series No. DS457 (future GSR Part 7). 	supersedes GS-R6 2	X			Editorial correction
8	Para 5	Add DS462 in the bullet list of safety standards to be taken into account		X			
Reviewer: United States of America		Country/Organization: US Nuclear Regulatory Commission			Date: 24 Septe		
1	Page 2 (4), Para. 3	“This guideline will also contain guidance on drills / exercises.”	With regard to drills and exercises, we suggest limiting the scope of this document to avoid detailed descriptions of drills and exercises that would be better placed in a guide on emergency planning.	X			Accepted: It could be profitable to make clear that security is something specific that should not be addressed in the guide but can be dealt with through proper scope of interfaces and lines of responsibility. In NS-G-2.15, scope of interfaces and lines of responsibility are described in article 3.109.
2	Page 7 (1)	Accident management guidance should be developed and maintained based on the plant design, <u>operating experience</u> , available internal and external PSA insight (if available), and current industry management guidance.	Add operating experience to develop accident management guidance to address any site specific features or experience of the plant (especially if PSA insights are not available).	X			Accepted: Clarification
3	Page 7 (3),	Accident management guidelines	Accident management				Accepted:

	Sent. 1	should be developed for establishing core cooling and critical monitoring functions <u>maintaining critical functions</u> (such as core cooling, containment integrity and critical monitoring functions) if DC power is lost during a prolonged loss of all AC power.	guidelines should be broader than just core cooling and critical monitoring functions.	X			Editorial correction
4	Page 7 (3)	These strategies should serve to prevent or <u>mitigate</u> core damage, if possible preserve containment , and to mitigate the extent of damage and reduce the potential for a large off-site release of radioactive materials.	Severe accidents could pose a challenge to containment, and if the reactor vessel may be breached, then it is important to protect containment, hence “hardened vents.”	X			Accepted: Editorial correction
5	Page 7 (5 and 6)	Equipment required to responding <u>respond to</u> a long-term loss of all AD <u>AC</u> and DC power and loss of the ultimate heat sink should be conveniently staged, protected, and maintained such <u>that</u> it is always ready for use if needed.	AD is incorrect and should be “AC.”	X			Accepted: Editorial correction
6	Page 7 (6)	“...assuming normal AD <u>AC</u> and DC power...”	AD is incorrect and should be “AC.”	X			Accepted: Editorial correction
7	Page 7 (8)	“...injecting seawater or other water sources into the reactor <u>or containment</u> without the need for external authorization...”	Add “or containment” to allow emergency director to also take actions to prevent reactor vessel from being breached upon fuel melt. Adding water to containment could also damage the vessel long term, but it also may prevent the vessel from being breached following fuel melt.	X			Accepted: Add water injection to the containment to prevent reactor vessel from being breached upon fuel melt.
8	Page 8 (12)	Delete item (12).	This is redundant to item (5) on page 7.	X			Accepted: Combine with item (5)
9	Page 8 (13)	There are two <u>three</u> direct lessons from	The added words provide				Accepted:

		this which plants should evaluate for applicability:	direction, instead of just pointing out the information.	X			Editorial correction
10	Page 8 (second item 12)	Renumber, to avoid duplicate (12). - ... - Deviations from accepted international/ <u>vendor</u> guidance (e.g., Owners Group SAMG) should be documented. - The SAMG needs to reflect the current plant design and operation - as changes to plant design are made; changes to SAMG also need to be made <u>evaluated for revision</u> .	SAMGs are typically not so specific that plant design changes require SAMG changes.	X			Accepted: Editorial correction Separate with item (12)
11	Page 8 (15)	Leadership and response under extreme duress was heroic but not systematically planned in advance. Exercise and drill focus on routine emergencies rather than catastrophic emergencies where all planned resources are not available. <u>Periodic drills and exercises should be performed where planned resources are not readily available.</u>	Added suggestion to conduct drills/exercises where all equipment may not be available (more conservative).	X			Accepted: Clarification
12	Page 8 (15)	Leaders need to be chosen based on ability to lead under catastrophic conditions where planned capabilities are not available.	Deleted guidance for choosing leaders. Qualification as an Emergency Director should fill this role.	X			Accepted: Details guidance to choose leaders will be decided depend on MS's practice
13	Page 9	Add: 3.15 Periodic reviews (new)	Reviews are important to ensure that the accident management program is up to date.		Change the title of 3.12, "Periodic reviews"		Accepted: Periodic review is already included in Section 3.12, "new information"
Reviewer: ENISS		Country/Organization: ENISS				Date: September 23, 2013	
1	Title	Severe Accident Management Programme for <u>Water Cooled</u> Nuclear	It is explained in the scope (section 4) that this guide is			X	Rejected: Large portions of NS-

		Power Plants	<p>mainly intended to be applicable to water cooled reactors even though the principles are anticipated to remain valid for other reactors such as RBMK. Why only list RBMK and not liquid metal cooled reactors for example? Could the same statement apply to LCMRs? Therefore a modification in the title is suggested avoid potential issue, unless there is no doubt on the applicability to all sorts of technologies.</p>				<p>G-2.15 can be applicable to RBMK which was verified by Review for Accident Management Programme (RAMP) for Ignalina NPP of Lithuania in 2007. As to applicability of LCMRs, if potential difficulties will be identified by LMCR specialists in the revision phase, its guidelines will be added.</p>
2	Annex 1	General comment on the feedback analysis report	<p>It is suggested to remove the “so-called” lessons learned listed in annex 1 because it is not clear whether they apply to a specific reactor technology or whether they are generic (some appear to be very technically oriented). Some so-called “lessons learned” seem to be very partial (e.g. item 3). In addition, very probably, not all the lessons learned have been drawn yet and the revision of this safety guide should consider all the relevant lessons learned as they arise and are validated at international level - following an open and transparent process (i.e.</p>		<p>“Additional inputs on lessons learned from Fukushima Daiichi accident have also been provided by IAEA international expert meetings (IEMs) and technical reports published by authorized international organizations, IAEA, OECD-NEA, INPO and national organizations, US NRC, CNSC, ENSRG, TEPCO, etc.”</p>		<p>Most of Fukushima Daiichi lessons learnt are identified in IAEA international expert meetings (IEMs) and technical reports from authorized international organizations, IAEA, OECD-NEA, INPO and national organizations, US NRC, CNSC, ENSRG, TEPCO, etc. This is listed tentatively in the consultant meeting. During the revision process, they will be reviewed and updated.</p>

			not a consultancy meeting).				
3	Annex 1, Fukushima lessons learned Item 15	(15) Leadership and response under extreme duress was heroic but not systematically planned in advance. Exercise and drill focus on routine emergencies rather than catastrophic emergencies where all planned resources are not available. •Leaders need to be chosen based on ability to lead under catastrophic conditions where planned capabilities are not available.	It would be good to have Leaders who have the "ability to lead under catastrophic conditions" - However it is difficult, if not impossible to choose leaders as any possible training will never be able to mimic a "true" catastrophic.		•Leaders need to be chosen based on ability to lead under catastrophic conditions where planned capabilities are not available.		Partially accepted: In the light of Fukushima Daiichi accident, leadership and management is very important issues. However, details guidance to choose leaders is decided depend on MS's practice
Reviewer: GD		Country/Organization: FRANCE/MEDDE			Date: September 23, 2013		
1			Safety/security interfaces are obvious if a malevolent action is the initiator of a severe accident. Conditions for management of the accident might then need to be adapted. However the NSGC has not yet discussed the management of major security events on a facility. Therefore it is not advisable to encompass all initiators in this document. FR proposes that the scope of the document remains limited to "accidental precursors" and excludes management of accidents during a security event	X			Accepted: In NS-G-2.15, it will be stressed that appropriate interfaces and lines of responsibilities need to be established with all other involved organizations or staff, including that in charge of security.
Reviewer:		Country Organization: Japan/NRA			Date: September 20, 2013		
1	Page 1 3.	...In other word, the NS-G-2.15 needs to extend its guidance to	General terminology consistency with other	X			Accepted: Consistency with other safety standards

	JUSTIFICATION... L3	core/debris radioactive materials cooling,....	safety standards				
2	Page 3 L4	No. SSR-2/2, IAEA, Vienna (2012 2011)	Editorial	X			Accepted: Editorial correction
3	Page 3 Safety Standards	2 nd , 3 rd and 4 th bullets should be deleted.	These documents already exist in previous section.	X			Accepted: Editorial correction
4	Page 3 Safety Standards	Add GS-R-3, DS456 and DS462.	These requirement documents should be added in because 'leadership and management' is very important thing to be applied, as well as amendment of DS462.	X			Accepted: Add GS-R-3, DS456 and DS462
5	Page 3 Safety Report Series	2 nd bullet should be deleted.	If this document is as same as that in next Service Series, they are duplicated.	X			Accepted: Editorial correction
6	Page 6, Just before section 2	The revision of NS-G-1.12 will also provide guidance supporting the proposed new revised requirements.	Clarify the safety standard number and justify the necessity of the revision.	X			Accepted: It means that the revision of NS-G-1.12, design of reactor core for NPPs will provide guidance supporting the new revised requirements SSR-2/1.
7	Page 7, <u>Fukushima lessons learned</u>	<u>Lessons learned from the Fukushima daiichi Nuclear Power Plants accident and others</u>	Adequate description. There seems to be included in other lessons and learned from the Fukushima daiichi Nuclear Power Plants accident.	X			Accepted: Editorial correction
8	Page 7, (5)	(5) Equipment required to responding a long term <u>prolonged</u> loss of all	Editorial Long term unavailability of	X			Accepted: Editorial correction

		ADAC and DC power ...					
9	Page 7, (12)	Delete (12).	Duplicated with (5) and (12).	X			Accepted: Editorial correction
Reviewer: Thomas.Froehmel@eon.com		Country/Organization: WNA			Date: September 20, 2013		
1	Title	Severe Accident Management Programme for <u>Water Cooled Nuclear</u> Power Plants	It is explained in the scope (section 4) that this guide is mainly intended to be applicable to water cooled reactors even though the principles are anticipated to remain valid for other reactors such as RBMK. Why only list RBMK and not liquid metal cooled reactors for example? Could the same statement apply to LCMRs? Therefore a modification in the title is suggested avoid potential issue, unless there is no doubt on the applicability to all sorts of technologies.			X	Rejected: Large portions of NS- G-2.15 can be applicable to RBMK which was verified by Review for Accident Management Programme (RAMP) for Ignalina NPP of Lithuania in 2007. As to applicability of LMCRs, if potential difficulties will be identified by LMCR specialists in the revision phase, its guidelines will be added.
2	Annex 1	General comment on the feedback analysis report	It is suggested to remove the “so-called” lessons learned listed in annex 1 because it is not clear whether they apply to a specific reactor technology or whether they are generic (some appear to be very technically oriented). Some so-called “lessons learned” seem to be very partial (e.g. item 3). In addition, very probably, not all the lessons learned have been drawn yet and		“Additional inputs on lessons learned from Fukushima Daiichi accident have also been provided by IAEA international expert meetings (IEMs) and technical reports published by authorized international organizations,		Accepted: Most of Fukushima Daiichi lessons learnt are identified in IAEA international expert meetings (IEMs) and technical reports from authorized international organizations, IAEA, OECD-NEA, INPO and national organizations, US NRC, CNSC,

			the revision of this safety guide should consider all the relevant lessons learned as they arise and are validated at international level - following an open and transparent process (i.e. not a consultancy meeting).		IAEA, OECD-NEA, INPO and national organizations, US NRC, CNSC, ENSRG, TEPCO, etc.”		ENSRG, TEPCO, etc. This is listed tentatively in the consultant meeting. During the revision process, they will be reviewed and updated.
Ukraine/ State Scientific and Technical Centre for Nuclear and Radiation Safety (SSTC NRS)							Date: Oct. 10, 2013
1	Annex 1, page 7	(1) Accident management guidance should be developed and maintained based on the plant design, available internal and external PSA insights, severe accidents analyses (if available), and current industry management guidance. Deviations from plant design requirements and industry standard accident management guidance should receive a rigorous technical and safety review that considers the basis of the original standard and the potential unintended consequences of deviating from this standard	Any available severe accident analyses (plant-specific or plant type-specific) should be considered as additional source of information for SAMG development.	X			Accepted: Clarification It was already described in NS-G-2.15 at Sections 3.8. Additional important elements that should be considered in the development of an accident management programme include: (9) A systematic approach to incorporating new information and new insights on severe accident phenomena.
2	Annex 1, page 8	It is proposed to add a new bullet (e.g., between items (3) and (4)): Accident management guidelines should be developed to cover all operating conditions including full power and shutdown states.	To outline the scope of SAMP. See Chapter 4 OBJECTIVE AND SCOPE: "Safety Guide will be developed for severe accident management during all operating conditions for both the reactor and spent fuel pool".		Accident management guidelines should be developed to cover <u>all modes of plant operation including shutdown states.</u>		Accepted: Clarification It was already described in NS-G-2.17. Severe accident management should cover all modes of plant operation.... temperatures, droughts)

3	Chapter 4, Para 2, Page 2	It is proposed to add the following statement “Specifics of the simultaneous severe accidents at the reactor core and spent fuel pool and their mutual impacts will be addressed”	Lesson learnt from the Fukushima Daiichi accident	X			Accepted: Add in Section 4 at paragraph 2
4	Chapter 4, Para 3, Page 2	It is proposed to add the following statement “Correlation between severe accident management program and emergency preparedness (on-site and off-site) will be ensured”	Lesson learnt from the Fukushima Daiichi accident		“ <u>Responsibility</u> between severe accident management program and emergency plan (on-site and off-site) will be ensured”		Accepted: It was already described in NS-G-2.15 at Sections 3.90. The responsibilities defined in the documentation of the severe accident management programme should be reflected in the emergency plan. In this regard, using word “Responsibility” instead of “Correlation” for clarification
5	Para 2 Page 8	Fukushima lessons learned: (12) – needs to be removed	(12) duplicates (5)	X			Accepted: Editorial correction
6	General	It is proposed to incorporate, into DPP, explicit mentioning of the need to address the interfaces with security issues in the Safety Guide. This can be done, for instance, through adding relevant statement(s) to section 4 and/or 5, and introducing correspondent section title in Annex 2	The guide is not supposed to address the security issues in detail. However, it would be reasonable to outline the presence of such interfaces and indicate the need to address them in relevant plant documentation. Examples: site access for outside supporters during accident or need in specific	X			Accepted: In NS-G-2.15, it will be stressed to Section 4 and 2.6 Roles and responsibilities in Annex 2 that appropriate interfaces and lines of responsibilities need to be established with all other involved organizations or staff,

			procedures in case when an accident has resulted from intruder attack.				including that in charge of security
--	--	--	--	--	--	--	--------------------------------------