

DPP DS440, Design of Auxiliary Systems in Nuclear Power Plants

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Steven Sholly Country/Organization: Austria		Page 1 of 2. Date: 07 June 2010					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	General	The DPP should be revised to specify that the Standard, once developed, will include a definition of "auxiliary system" that will be proposed for inclusion in the IAEA Safety Glossary. A working definition for "auxiliary system" would be a useful addition to the DPP.	The phrase "auxiliary system" is not defined in the 2007 IAEA Safety Glossary.	Definition will be included in the IAEA Glossary			
2	Section 2	See "Reason" column.	The DPP as proposed lists eight other Safety Guides that address auxiliary systems. How will DS440 distinguish its coverage of auxiliary systems from the long list of existing guides that cover some auxiliary systems as noted given in Section 2? How will overlap with these existing guides be avoided? How will the reader of any of these guides know that DS440 exists? How will the reader of DS440 know that the others exist? How will consistency in treatment of auxiliary systems be maintained between the eight existing Safety Guides and the proposed standard in DPP DS440? Either clear and comprehensive cross-referencing should be done in DS440, or DS440 should be used to cover <u>all</u> auxiliary systems.	Cross References will be included  This Safety Guide is not aimed at superseding the existing safety guides, but will provide guidance for all auxiliary and supporting systems that are not currently covered by existing Safety guides			

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COMMENTS BY REVIEWER				RESOLUTION			
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3	Section 2	Add a list of missing auxiliary systems to Section 2.	The last sentence in Section 2 states, "In addition in the above safety guides not all important auxiliary systems are included." Which "important auxiliary systems" are missing from the above list? The reader of the DPP should know what the Technical Officers have in mind in terms of scope of coverage. The important auxiliary systems to be covered should be specifically listed. Note that such a list will vary from plant-to-plant, and especially so for Generation III and Generation III+ designs.	X  Examples of other Auxiliary Systems are given in Section 6			
4	Section 3	See "Reason" column.	The 3 <sup>rd</sup> paragraph under Section 3 of the DPP states, " <i>The purpose of this Safety Guide is to provide recommendations to meet requirements for Auxiliary systems listed in the revised Safety Requirements for the Design of Nuclear Power Plants.</i> " Unfortunately, such a listing seems to be missing from the current the revision of DS414 that we will discuss at the 29 <sup>th</sup> NUSC meeting. The listing should be included in the DPP, and not referenced to a draft document that could change (and in this case, has changed).		A preliminary list is provided at the end of the DPP.  Because DS 414 is still subject to change, it is preferable to refer only to the corresponding section of DS 414		

DPP DS 440 "Design auxiliary systems in NPP"

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Pieter DE GELDER and Benoit DE BOECK Country/Organization: Belgium/Bel V Date: 03/06/2010							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Title	Proposed Title should be "Design <u>of</u> Auxiliary Systems ..." (as for all other SG listed in § 2 Background)	Consistency	X			
2	6	Concerning the "List of Contents"; partim "Specific considerations": we think that Fire protection systems should be out of scope of this guide. First, they are not really auxiliary systems in the sense that they provide "support" to another system (they more have a protection function of other systems); secondly, there is already NS-G-1.7 that deals with those type of systems; having a second SG on the same type of systems might cause problems (inconsistencies, ...).	Consistency	X	Cross references associated to supporting systems will be introduced in the Safety Guide. It is not aimed at superseding the existing safety guides, but will provide guidance for all auxiliary and supporting systems that are not currently covered by existing		

				Safety guides			
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Comments on IAEA DPP for DS 440 "Design Auxiliary Systems in Nuclear Power Plant"

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer:		Date: May 31, 2010					
Country/Organization: EC							
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	P 1	The title of the document shall be "Design of Auxiliary ....."	Consistency with other IAEA SS on design	X			
2	P1 & P2	The first two paragraphs of Chapter 3 are repetition of first paragraph of chapter 4.	Duplication.	X First paragraph of Chapter 4 deleted			
3	P 1	Fourth paragraph of chapter 3 states that the guide shall provide recommendation for the content of the corresponding chapters of the Safety Analysis Report. It is suggested not to do so to avoid duplication and confusion with the guide on the Content and Formant of the SAR.	Consistency of the IAEA SS – so far recommendations for the content of the SAR are not given in any of the IAEA guides for design.		Text modified as follows: "To provide guidance to review the corresponding sections of the Safety Analysis Report related to Auxiliary Systems" (reference to the content of the SAR has been deleted)		
4	P2	In "Extent of the auxiliary systems" it is suggested to have "main" and "other" auxiliary systems – is there a justification for such additional classification? If, yes, what is the basis?? Inclusion in NS-R-1 or not?	Clarification		Auxiliary and supporting systems will be addressed in NS-R-1 Definition will be included in the IAEA Glossary		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer:		Date: May 31, 2010					
Country/Organization: EC							
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
5	P2	"Extent of the auxiliary systems" third bullet : Other auxiliary systems:	It is not clear which kind of criteria will be used to select Auxiliary systems to be included under this title. Are these systems supposed to be plant specific, e.g. PWR, BWR, CANDU, GFR, etc? Will there be any annex to list plant specific Auxiliary systems?		X Reference is made to the definition of auxiliary system to be introduced in the IAEA Glossary  Examples of plant specific Auxiliary systems will be provided.		

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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Country/Organization .... Finland		Page.... of.... Date: 7 <sup>th</sup> June 2010					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	Overview  General considerations	<p>GENERAL CONSIDERATIONS</p> <p>This section will be mainly based on the corresponding structure of NS-G-1.9 (Design of the Reactor Coolant System and Associated Systems in Nuclear Power Plants). If applicable, it will provide guidance to meet the general requirements of NS-R-1 for following items:</p> <p>Design basis of the plant and auxiliary systems</p> <p>Objectives of the design (DID...)</p> <p>Safety classification</p> <p>Qualification</p> <p>Reliability</p> <p>Postulated initiating events</p> <p>Internal, external hazards and human failures</p> <p>Interface with other systems</p> <p>Considerations for multi-unit nuclear power plants</p> <p>Plant design</p> <p>System Design and component design</p> <p>Safety assessment of the plant (deterministic and probabilistic)</p>	<p>The design of the plant should be presented.</p> <p>also human failures should be considered.</p> <p>It is very easy to spoil defense in depth design with auxiliary systems.</p>		<p>X</p> <p>Design basis of the plant and auxiliary systems</p> <p>Objectives of the design (DID...)</p> <p>Safety classification</p> <p>Qualification</p> <p>Reliability</p> <p>Postulated initiating events</p> <p>Internal , external hazards and human errors [FIN1]</p> <p>Interface with other systems</p> <p>Considerations for multi-unit nuclear power plants</p> <p>Plant design</p> <p>System Design and component design</p> <p>Safety assessment of auxiliary systems [FIN1]</p>		

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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: F. Féron		Page					
Country/Organization: France / ASN		Date: 04 June 2010					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	§6	After "fire protection systems", add "explosion protection systems"		x			
2.	§6	What about waste management systems ?			Cross references will be made with the SG on "Radioactive Management Aspects for the Design of NPPs, Research Reactors and Waste Management Systems", that is under development		
3.	§6	What about effluent management systems ?			Cross reference will be made with the SG on "Radioactive Management Aspects for the Design of NPPs, Research Reactors and Waste Management Systems", that is under development		
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COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Ferenc Adorjan		Page.... of....					
Country/Organization: HAEA Hungary		Date: 06/06/2010					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	general	Auxiliary system: any SSC important to safety, having no safety function related to preventing occurrence of an initiating event or acting automatically to intercept or mitigate the effect of any initiating event within the design basis. These include the support systems ensuring the long term fulfilment of safety functions, the systems ensuring the human servicing of some areas following a transient or an initiating event.	The "Auxiliary system" should be defined to avoid any confusion. The need for such definition is specifically important for the "innovative" designs. A possible attempt for the definition (which perhaps should be included in the Glossary).	X A definition will proposed in the IAEA Glossary			



COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: H. Tezuka, T. Oshima		Page 1 of					
Country/Organization: Japan/ JNES, NISA		Date: 4 June 2010					
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modif./rejection
1	General	Auxiliary systems are not self-standing systems in safety systems therefore it is better to be with their main systems from the user friendly point of view. Justification in this DPP mentions that NS-R-1 has a new separate dedicated section for Auxiliary Systems and that requests its corresponding safety guide. On the other side, it is understood that safety recommendations/guide for auxiliary systems are sufficiently covered in each safety guide. That's why justification of this DPP is not clear for the need of a new safety guide.			Not all auxiliary and supporting systems are addressed in the existing safety guides		
2	Content of the guide	Nevertheless, in case the development of this new guide is supported, fire protection systems should be deleted from the content since there is a specific design guide (NS-G-1.7 <i>Protection against Internal Fires and Explosions in the Design of Nuclear Power Plants</i> ).		Cross references will be given for the existing safety guides			

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Anwar Habib		Page 1/2					
Country/Organization: Pakistan/PNRA, Islamabad		Date: 20/05/2010					
Comment No.	Para/Line No	Proposed new text	Reason	Accepted	Accepted but modified as follows	Rejected	
1.	6.overview Extent of the Auxiliary systems	Comments: The section "EXTENT OF THE AUXILIARY SYSTEMS" may be deleted from the contents of the proposed safety guide.	According to the new safety standards format, definitions are not included in the standards/guides. Therefore, subsection definition will be eliminated. The list of the auxiliary systems need not be given in this section separately as it would be listed in section "specific Consideration".	X	A definition of the Auxiliary Systems will be included in the IAEA glossary.		
2.	6.overview General consideration	According to DPP, the structure of the safety guide will basically follow the structure of existing safety guides to meet the requirements of NS-R-1. This include: <ul style="list-style-type: none"> <li>- Design basis</li> <li>- Objectives of the design</li> <li>- Safety classification</li> <li>- Qualification</li> <li>- Reliability</li> <li>- Postulated initiating events</li> <li>- Internal and external hazards</li> <li>- Interface with other systems</li> <li>- Considerations for multi-unit nuclear power plants.</li> </ul> Comment: It is proposed to delete general consideration from the contents of the guide.	The guidance on the general requirements of NS-R-1 may not be included in the guide on design of auxiliary systems. There should be a separate guide to provide guidance on general requirements.		The aim of this Chapter is to propose to follow the same structure has the one presented in the existing safety guides, ( NS-G-1.9 Design of the Reactor Coolant System and Associated Systems in Nuclear Power Plants) as specified in the section "General consideration"		
3	6. overview Specific consideration	- Following auxiliary systems may be added in the section of specific consideration:	These are important auxiliary / supporting systems therefore should be included in the in the	Communicati on system Diesel		- Fuel Storage and handling	

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Reviewer: Anwar Habib		Page 1/2					
Country/Organization: Pakistan/PNRA, Islamabad		Date: 20/05/2010					
Comment No.	Para/Line No	Proposed new text	Reason	Accepted	Accepted but modified as follows	Rejected	
		<ul style="list-style-type: none"> <li>- Fuel storage and handling</li> <li>- SFP cooling and cleanup</li> <li>- Water systems</li> <li>- Chemical and volume control systems</li> <li>- Boron recycle system</li> <li>- reactor cavity flooding system</li> <li>- Communication system</li> <li>- Diesel generator systems including; fuel oil and transfer, cooling water, start up, lube oil and combustion air intake and exhaust systems.</li> </ul>	section of specific consideration of guide.	generator systems including; fuel oil and transfer, cooling water, start up, lube oil and combustion air intake and exhaust systems  Have been added to the list		- SFP cooling and cleanup are already the purpose of a dedicated Safety Guide (NS G 1.4 -CVCS and Boron Recycle system are already addressed in NS G 1.9 -Reactor cavity flooding system is reactor specific (could be addressed as other auxiliary and supporting systems	

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: Carmen Muñoz Country/Organization: (SPAIN) Consejo de Seguridad Nuclear -CSN Date:							
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	Title	"Design of Auxiliary Systems in Nuclear Power Plants"		X			
2	6. OVERVIEW	"consistent with a list of NS-R-1 and <u>GS-G-4.1</u> "	GS-G-4.1 <i>Format and Content of the Safety Analysis Report for Nuclear Power Plants</i> , already includes a list of auxiliary systems that should be taken into account.	X			
3	6. OVERVIEW. GENERAL CONSIDERATIONS	"GENERAL CONSIDERATIONS <u>IN DESIGN</u> "	Accordingly to NS-G-1.9 <i>Design of the Reactor Coolant System and Associated Systems in Nuclear Power Plants</i> .	X			
4	6. OVERVIEW. SPECIFIC CONSIDERATIONS	"SPECIFIC CONSIDERATIONS <u>IN DESIGN</u> "	Accordingly to NS-G-1.9 <i>Design of the Reactor Coolant System and Associated Systems in Nuclear Power Plants</i> .	X			
5	6. OVERVIEW. GENERAL CONSIDERATIONS	The following items could be added to the list: <ul style="list-style-type: none"> <li>- seismic considerations;</li> <li>- provision for overpressure protection and water-hammer;</li> <li>- provisions for in-service inspection, testing and maintenance;</li> <li>- protection against corrosion and other degradation phenomena;</li> <li>- protection against extreme weather conditions</li> </ul>	Some of these items are consistent with those included in NS-G-1.9. The last item takes into account that sometimes auxiliary systems are located outside the buildings and therefore exposed to weather conditions (cold and hot). The rest come from the accumulated experience after years of Nuclear Power Plants operation.			-seismic considerations; -provision for overpressure protection and water-hammer; -provisions for in-service	Most of these item are already part as mentioned of NS-G-1.9 They appear to out of scope of the proposed Safety Guide to be developed. However, Cross References will be added

						inspection, testing and maintenance; -protection against corrosion and other degradation phenomena; -protection against extreme weather conditions	
6	6. OVERVIEW. SPECIFIC CONSIDERATIONS	Related to "Other auxiliary systems" a couple of examples could be added: – Communications – Emergency diesel auxiliary systems	Accordingly to GS-G-4.1.	X			
7	General comment		Fire protection systems should not be included in this guide since there is a specific design guide (NS-G-1.7 <i>Protection against Internal Fires and Explosions in the Design of Nuclear Power Plants</i> )		X  This Safety Guide is not aimed at superseding the existing safety guides. Cross References will be added		

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer: USA Country/Organization: USA Date: June 2010							
Comment No. / Reviewer	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	page 3 / SPECIFIC CONSIDERATIONS	<p>"... Lighting systems Other auxiliary systems <u>Ultimate heat sink</u> <u>Condensate storage and transfer systems</u> <u>Equipment and floor drainage system</u> <u>Communication systems</u> <u>Emergency diesel generator auxiliary systems(e.g., fuel oil, cooling water, starting air)"</u></p>	Provides consistency with guidance for auxiliary systems. These systems can be important for active plants and may be needed to support long-term cooling for both active and passive plants.	X			