Revision of 7 closely interrelated Safety Guides on the Operation of Nuclear Power Plants: NS-G-2.2 to 2.6, NS-G-2.8 and NS-G-2.14 (DPP DS497 indice 2)

NS-G-2.2: 125 comments / Accepted (fully or partially): 89 (67%) / Rejected: 43 (33%)

Some comments are multiple: one part can be accepted and another rejected; hence, total of "accepted" and "rejected" is not equal to number of comments

Country or Organization	Number of comments	Accepted	Rejected
Brazil	3	3	0
Egypt	6	5	1
ENISS	11	10	2
Finland	21	15	10
Germany	12	7	5
Iran	3	3	0
Japan	3	1	2
Poland	43	30	15
Russian Federation	1	0	1
South Africa	8	4	4
UK	6	6	0
USA	1	1	0
Pakistan	4	2	2
India	3	2	1

COMMENTS BY REVIEWER **Guide: NS-G-2.2** Reviewer: Lapa, N. S. Page 2 Country & Organization: Brazil - CNEN Date: 25/04/2019				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	8.18.A (proposed)	SAMGs should be verified and validated to ensure that they are administratively and technically correct, are easy for the operator to use and will function as intended. SAMGs should be compatible with the environment in which they are intended to be used. The SAMGs should be validated in the form in which they will be used in the field.	SAMGs must be checked in relation to actual accident condition simulation, as well as to verify their objectivity. SAMGs should be user friendly to the users.	Yes	A new paragraph is added: 8.18 SAMGs should be verified and validated in order to assess the technical accuracy and adequacy to the extent possible, as well as the ability of personnel to follow and implement the guidance and that the interfacing between SAMGs and EOPs is effective. The SAMGs should be periodically reviewed to ensure that they remain fit for their purpose.		
2.	8.18.C (proposed)	The technical support centre and the control room operators should be periodically trained to apply SAMGs.	The technical body needs prepared to make the best decision possible supported by this guide in a case of a severe accident in course.	Yes	A new sentence is added at the end of paragraph 8.16: These categories staffs should be trained in the use and application of the SAMGs.		
3.	8.18.D (proposed)	SAMGs should be periodically reviewed to ensure that they remain fit for their purpose and if necessary the procedures should be modified, verified, validated and approved, as required. The guides should be updated	SAMGs outdated could be cause more problems than solutions in a severe accident conditions, because could proposed some strategies employing	Yes	See comment 1 above. The second sentence addresses the periodical review.		

		periodically and in a timely manner in the light of operating experience, the actual plant configuration and the new research results. Following the completion of a plant modification the modified system/equipment should not be put into operation until the related strategies have been reviewed for applicability and modified accordingly. Review of SAMGs should also be performed as part of a Periodic Safety Review to determine whether the operating organization's processes for managing, implementing and adhering to plant procedures and for maintaining compliance with operational limits and conditions and regulatory requirements are adequate and effective to ensure plant safety.	ways incompatibles with the actual system of the plants or in relation a new good practice.				

COMMENTS BY REVIEWER				RESOLUTION			
Guide: NS-G-2.2 Reviewer: Moustafa Aziz Country & Organization: Egypt - ENRRA			Page 3 Date: 29/05/2019				
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	1.3	Section 1.3 Refers to Ops and section 1.4 OP if both of them refers to the same value , they should be unified.		Yes	The word "procedures" was missing as well.		
2.	1.6	Section 1.6 refers to section 2 (the relation between the fundamental safety objective and OLC, but		Yes			

		section 2 as indicated in the same page is deleted.					
3.	3.5 Page 14	The word “awarenesson“ should be separate to be awareness on.	Editorial	Yes	Awareness on		
4.	3.13 Page 15	Any modification to the OLCs should be subject to assessment and approval by the operating organization and regulatory body following the established procedures at the plant.	The regulatory body should participate in reviewing OLC.			Yes	Please, see DDP: “All references to the involvement of regulators in the operational activities (commissioning, maintenance, operation, modification, etc.) currently available in the operational safety guides should be deleted.”
5.	6.5 Page 20 And 7.2 Page 21 And 8.14	Contains different writing fonts, may be it is necessary to unify the font.		Yes	Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff in the final editing process.		
6.	8.8 And 8.16	Letters (LSEP) appears at the end of sentences 8.8 a, b, c, d; it should be deleted.		Yes	Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff in the final editing process.		

COMMENTS BY REVIEWER				RESOLUTION			
Guide: NS-G-2.2 Reviewer: ? Country & Organization: ENISS			Page 4 Date: 29/05/2019				
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	3.2	These operational states should include starting up, power production (including power modulations/load changes),	Not all power plants keep running on 100% full power, sometimes they have to reduce	Yes	Modified to: *Normal operation states should include starting up, power operation, shutting down,*	Yes	Modified to be in line with the definition of Normal Operation in the IAEA

		shutting down, maintenance, testing and refueling.	power to maintain grid stability		*shutdown, maintenance, testing and refuelling*. Due to a comment from IRAN.		Safety Glossary (plant states).
2.	3.3	Safe operation depends upon personnel as well as on equipment and procedures; OLCs should therefore also cover actions to be taken and limitations to be observed by operating personnel	Technical and administrative procedures are an important part of safe operation.	Yes			
3.	6.5	…procedures for determining the actions and evaluations to be carried out should be available before the restart of the reactor. If OLCs have been exceeded, the cause should be investigated. More information can be found in	Before you can restart the reactor, you must know the reason of the error	Yes	It is stated in the sentences before that the evaluations should be performed before the restart. The ENISS proposal have been modified to: Procedures for determining the actions and evaluations to be carried out should be available beforehand.		
4.	8.3	8.3.C When verbal and/or written instructions are used in operational practice at a nuclear power plant, administrative procedures should be in place to ensure that the verbal and/or written instructions do not diverge from the established OPs and do not compromise established OLCs.	8.3 → 8.3.C	Yes	Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff in the final editing process.		
5.	8.4	8.4. Operating procedures should be verified and validated to ensure that they are administratively and technically correct, are easy for the operator to use, are understandable and will function as intended. OPs should be	Easily to use includes the format of the procedure, but the written text must be easy to understand for the user of the procedure	Yes			

		compatible with the environment in which they are intended to be used. The OPs should be validated in the form in which they will be used in the field.					
6.	8.17	8.17 To ensure the effective use of SAMGs, it should be carefully interfaced with the existing EOPs to avoid any omissions. For guidance about the interfacing between EOPs and SAMGs and the transition from EOPs to the SAMGs, see Ref. ~~Severe~~ Accident Management Programme for Nuclear Power Plants, Specific Safety Guide ~~Standards Series~~ No. SSG-54 ~~NS-G-2.15~~, Vienna (20~~0~~19) [11])	NS-G-2.15 has been superseded by SSG-54	Yes			
7.	8.18.F	8.18.F The means of making interconnections between units should be addressed in the SAMGs. The SAMGs should consider the use of any available and inter-connectable means between units during a severe accident and/or a design extension condition. More information can be found in Ref. ~~Severe~~ Accident Management Programmes for Nuclear Power Plants, IAEA Specific Safety Guide SSG-54 ~~Standards Series No. NS-G-2.15~~ [11].	See comment 6	Yes			
8.	9.6	(b) Appropriate links between procedures to avoid omissions and duplication, and clear identification of entry and exit conditions (including ending of the emergency situation);	There must be a clear definition or a clear process in the procedure to decide when the emergency situation is over and the crew can	Yes	(b) Appropriate links between procedures to avoid omissions and duplication, and clear identification of entry and exit conditions, including		

			restart normal operations		ending of the emergency situation;		
9.	9.7	9.7.A Any modifications to the operating procedures should be made in accordance with the applicable plant procedures. Modified operating procedures should be verified and validated before use. Any other operating procedures affected by the modifications should be revised and operators should be trained as needed in the revised procedures Ref.[8]. For ad hoc modifications, the plant should have a process in place to manage these modifications.	Sometimes, plant operations require last minute adjustments of procedures. This should be covered by a process			Yes	"Last minute adjustments" or "Ad hoc" changes must be avoided.
10.	Appendix I I.11	I.11. In PWRs, particular attention should be paid to minimizing the possibility of a boron dilution event during shutdown operations. Limits and conditions on the boron concentration, neutron flux monitoring in the range of the source, isolation of un-borated water sources ~~and emergency boron systems~~ should be stated and emergency boron systems should be in stand by.	When an unwanted dilution has occurred, a fast boration of the primary system is necessary. The boration system to use must be stand by and must be clearly indicated in the main control room.	Yes			
11.	References	[11] INTERNATIONAL ATOMIC ENERGY AGENCY, ~~Severe~~ Accident Management Programmes for Nuclear Power Plants, IAEA Specific Safety Guide SSG-54~~Standards Series No. NS-G-2.15~~, IAEA, Vienna (20~~0~~19) ~~Under Revision~~	See comment 6	Yes			

COMMENTS BY REVIEWER **Guide: NS-G-2.2** Reviewer: M-L Järvinen Country & Organization: Finland - STUK			Page 8 Date: 28/05/2019	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	General	IAEA should consider developing a process for simultaneous development or revision of several safety guides. Lessons learned from the revision of the Safety Requirements after Fukushima Dai-ichi accident 2011 should be used in developing this process.		Yes	The team have been working like this. Lessons learned from the revision of the Safety Requirement were followed. DPP was developed based on this experience.		
2.	General	IAEA should consider presentation of the recommendations for maintenance only in one safety guide. The new safety guide for ageing management and LTO, SSG-48 presents current, updated recommendations for maintenance. The safety guide NS-G-2.6 and SSG-48 are overlapping.				Yes	Comment not relevant for NS-G-2.2.
3.	General	Development of procedures for accidents in NS-G-2.2 is overlapping and may be conflicting with SSG-54. The new accident management guide SSG-54 should be considered also in other relevant safety guides in this set.		Yes	Reference is made to SSG-54 in a new separate paragraph. SSG-54 supersedes NS-G-2.15 which is reflected in the reference list. Overlapping or possible conflicts have been checked. SSG-54 was considered during revision of the set of Operation safety guides. Mr Harri Tuomisto was		

		IAEA should consider presentation of the recommendations only in one safety guide.			involved and ensure consistency. However, SSG-54 was published only in 2019 and draft document was used.	Yes	Presentation of recommendations only in one guide is not possible and not recommended.
4.	General	Core management section is overlapping in NS-G-2.5 and in DS488. IAEA should consider presentation of the recommendations only in one safety guide.				Yes	Comment not relevant for NS-G-2.2.
5.	General	It is not clear from the guidance which safety requirements are covered by each safety guide. There should be a transparent and systematic way of presented the covered safety requirements in each safety guide. As a part the allocation of the requirements made for DPP DS497 should be utilized.		Yes	But reference to requirements 6 and 26 is made in paragraph 1.3. Reference to requirement 19 and 33 have been added. Because of this is paragraph 1.3 rewritten. There are no other references in the guide to other requirements of SSR-2/2 Revision 1.		
6.	General	Safety-security interface should be implemented to all of the safety guides in a systematic manner. Some guides do net even mention the word security. The set of safety guide demonstrate the need for guidance on the management of the safety-security interface. Presently the safety guides give references to				Yes	Addressed consistently with the DPP scope. In addition, it is in contrary with comments No. 2, 3, 4 and 5. Please, see answer in the resolution table of the NS-G-2.4 for this comment.

		security guides and vice versa. However, there is not always a suitable guide to reference for instance for safety-security interface in change management. The utilization of the synergies of implementation of safety security interface should be emphasized. There is need for a specific guidance on safety security interface management.					
7.	General	The terminology should be harmonized. There are several examples of the harmonization needs in the safety guide specific comments. The examples concerning the term risk are collected for safety guide NS-G-2.6. However similar review should be made for all of the safety guides and the use of term risk should be systemized.				Yes	This is out of the scope of the DPP. The word "risk" (or risks) is used six times in the NS-G-2.2, all without any conflict with the interpretation of the term in the IAEA Safety Glossary. In the IAEA Safety Glossary, "risk" is mentioned 93 times! Words used have to the extent possible been checked against the IAEA Safety Glossary.
8.	1.5	This Safety Guide covers the concept of OLCs, their content as applicable to land based stationary power plants with thermal neutron reactors, and the responsibilities of the operating organization regarding their establishment, modification, compliance and documentation. The OPs to support the implementation of the OLCs and to ensure their	Please make reference to appropriate safety guide instead of Ref. Radiation Protection and Safety of Radiation Sources: International Basic Safety Standard, IAEA General Safety Requirement Part 3 No GSR Part 3 [17].			Yes	The team see no reason to change the reference. The NS-G-2.2 do not cover RP and states that aspects of RP can be found in [17]. There are several guides in RP and instead of putting in all of the reference is made to the GSR. The team did not see the problem.

		observance are also within the scope of this Safety Guide. The particular aspects of the procedures for maintenance, surveillance, in-service inspection, radiation protection and other safety related activities in connection with the safe operation of nuclear power plants or on site emergency preparedness and response are outside the scope of this Safety Guide but can be found in Ref. Maintenance, Surveillance and In-service Inspection in Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-2.6 [2], Ref. Conduct of Operation at Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-2.14 [12] and Ref. Radiation Protection and Safety of Radiation Sources: International Basic Safety Standard, IAEA General Safety Requirement Part 3 No GSR Part 3 [17].					
9.	3.8	The OLCs should be based on a safety analysis of the individual plant and its environment in accordance with the provisions made in the final design as described in the safety analyses report Ref.[1]. Both deterministic safety analysis and probabilistic safety analysis should be used. The OLCs should be determined with due account taken of the uncertainties in the process of safety analysis. The safety	Please add. Both deterministic safety analysis and probabilistic safety analysis should be used. See also 3.16	Yes	Sentence added: The use of the deterministic safety analysis shall be complemented by probabilistic safety analysis as appropriate. In SSR-2/2 Revision 1, paragraph 4.32 provides guidance on how to use PSA. The proposal from Finland is modified to be in line with the more		

		analysis report and OLCs should be reviewed and amended where necessary on the basis of the results of commissioning testing. The justification for each of the OLCs should be substantiated by means of a written indication of the reason for its adoption and any relevant background information. These justifications should be readily available when necessary.			cautious use of PSA recommended in SSR-2/2 Revision 1.		
10.	3.16	Consideration should be given to probabilistic safety assessment (PSA) applications in the optimization of OLCs. This application relates to the use of a risk informed approach using insights from ~~deterministic analyses~~, PSA and operational experience to optimize allowed outage times, surveillance test intervals and test strategies. More information is available in Ref. Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants, IAEA Safety Standards Series No. SSG-3 [9].	Insight of deterministic analysis is ambiguous. See also 3.8. Deterministic analysis is the bases for the development of OLCs and also the for the development of PSA.	Yes			
11.	8.1.A	In developing operating procedures, including emergency operating procedures for design basis accidents and design extension conditions - without significant fuel degradation and severe accident management procedures or guidelines (or guidance) (SAMG) for postulated emergencies, the influence of human and organizational factors	Please add procedures. In new NPPs severe accident systems are part of the design and procedures are developed. The terminology adopted in SSG-54 should be used in the NS-G-2.2.	Yes		Yes	This is out of the scope of the DPP.

		on one, several, or all levels of defence in depth should be considered, to avoid negative impact on the reliability of these levels and the independence between the levels. The OLCs should be defined in such a way that the independence of the levels of defence in depth and their adequate reliability is ensured. See principle 8 in Ref. Fundamental Safety Principles IAEA Safety Fundamentals Series No. SF-1 [16].	SSG-54 Appendix A.1. Figure 3 presents a summary of the phases of accident management and their relationship to the state of the fuel and the accident condition. Of particular note in Fig. 3 is that the transition from EOPs to SAMGs is not always at a fixed point and can depend on Member State practices and plant conditions.	Yes	To be adjusted by IAEA staff in the final editing process.		
12.	8.3.B	For anticipated operational occurrences and design basis accident and DECs without significant core degradation, the OPs should provide instructions for the return to a safe state. For DBAs and DECS without significant core degradation, the procedures, to keep the plant state within specified limits, should be event based or symptom based.	Please add: DECs without significant core degradation. Similar goals are applied as for DBAs.	Yes	For anticipated operational occurrences, design basis accidents (DBA) and design extension conditions (DEC) without significant core degradation, the OPs should provide instructions for the return to a safe state. For DBAs and DECs without significant core degradation, the procedures to keep the plant state within specified limits, should be event based or symptom based.		
13.		SEVERE ACCIDENT MANAGEMENT PROCEDURES OR GUIDELINES (or Guidance as in SSG-54)	Please add: PROCEDURES OR. see 8.1.A			Yes	Only SAMGs are used in severe accident management.

14.	8.14	Severe accident management procedures or guidelines (SAMGs) necessary to cope with severe accidents should be identified by a systematic analysis of the plant's vulnerabilities to such accidents, and by the development of strategies to deal with these vulnerabilities.	Please add: PROCEDURES OR. see 8.1.A			Yes	Only SAMGs are used in severe accident management.
15.	8.16	SAMGs should be developed from the accident management strategies and measures to be used in the mitigatory domain of accident management. The purpose of SAMGs is to guide the emergency response organization during severe accidents. The operating personnel responsible for executing of the SAMG are normally the main control room teams and within the technical support centre at the site (or equivalent). Staff at a technical centre at corporate, regional or national level can also be the users of SAMGs in support to the concerned site.	Please change the order of the users of SAMGs. The main control room personnel are the first group of users. They are supported by the technical support centre.	Yes	The operating personnel responsible for executing of the SAMG are the main control room teams and staff in the technical support centre at the site (or equivalent). SSG-54 Paragraph 2.55 states: *Hard copies of the EOPs and the SAMGs should always be available in all evaluation and decision making locations, such as the main control room, the supplementary control room and the technical support centre, so that they can be used as necessary, in particular during a station blackout.* Spelling of *centre* corrected.		
16.	8.16.A	Plant specific details should be taken into account in the identification and selection of the most suitable actions to cope with severe accidents. ~~The SAMGs~~	SSG-54 is a better reference for this paragraph and the paragraph should be in line with SSG-54.	Yes	The words: *maintain the integrity of the containment* have been added. Reference to SSG-		

		~~should include the utilization of all possible means, safety related or conventional, permanent or non-permanent, in the plant or from neighbouring units or external, with the aim of preventing the release of radioactive material to the environment, see Ref. Preparedness and Response for a Nuclear or Radiological Emergency Series No. GSR Part 7, IAEA, Vienna (2015) [14])~~ SSG-54.	SAMGs are developed based on a clear strategy and systematic approach. The goal of SAMGs is to maintain the integrity of the containment. That could be presented in NS-G-2.2.		54 have been added. Nothing is deleted.		
17.	8.17	To ensure the effective use of SAMGs, it should be carefully interfaced with the existing EOPs to avoid any omissions. For guidance about the interfacing between EOPs and SAMGs and the transition from EOPs to the SAMGs, see Ref SSG-54.	Please update to be in line with SSG-54 which is the current reference.	Yes	Reference is changed from NS-G-2.15 to SSG-54.		*See also comment from ENISS.*
18.	8.18.F	The means of making interconnections between units should be addressed in the SAMGs. The SAMGs should consider the use of any available and inter-connectable means between units during a severe accident ~~and/or a design extension condition~~. More information can be found in Ref. SSG-54	Please update the reference SSG-54. Please consider the extend of presenting SAMGs in NS-G.2.2 instead of making reference to SSG-54.	Yes	Reference is made to SSG-54 instead of NS-G-2.15.	Yes	*See also comment from ENISS.* No change of the wording. Which is correct according to the IAEA Safety Glossary.
19.	9.6	Guidance specific to the plant should be provided in the following areas: (a) A clear definition of constraints specified in the safety analysis report and the OLCs; (b) Appropriate links between procedures to avoid omissions and	Delete ~~(beyond design basis accidents).~~ (beyond design basis accidents) causes confusion.	Yes			

		duplication, and clear identification of entry and exit conditions; (c) Presentation to the operator in a manner conforming to good practice in relation to human factors, including clarity of objective and meaning, and use where appropriate of flow charts, diagrams and other aids to the operator; (d) The need for written explanations of the basis for the procedure, to assist the user and persons modifying the procedure in the future; (e) A verification and approval process that includes validation for the plant in question or for a simulation as relevant as practicable; (f) The use of EOPs for dealing with accident conditions, including DBA and DEC without significant core degradation, and the use of SAMGs for management of severe accidents ~~(beyond design basis accidents)~~.	Or clarify if accidents beyond the design envelope are meant.				
20.	FIG II.I	Queries in flow diagram should follow rules: for example: Yes-answer always down and No-answer always left or right.	Flow diagram is unclear. It is easier to understand flow diagram and these rules are also used EOPs.	Yes	The figure will be corrected by IAEA staff in the final editing process.		
21.	ANNEX, FIG A-1	Figure is unclear.		Yes	The figure will be corrected by IAEA staff in the final editing process.		

COMMENTS BY REVIEWER **Guide: NS-G-2.2** Reviewer: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) (with comments of RSK and GRS) Page 17 Country & Organization: Germany Date: 29/04/2019				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	3.2 Line 5	…The OLCs should also define operational requirements to ensure that safety systems and safety features perform their functions in all operational states in design basis accidents (DBAs) and in design extension conditions (DEC) for which they are necessary. This may cover equipment used for accident management (AM) (including severe accident management) permanently installed, portable and mobile, in their standby conditions depending on the status of AM measures considered in the site defense in depth concept.	Accident Management Equipment in particularly those related to mobile equipment is not always covered by TEC SPEC requirements. It is dependent on the status of AM measures in the defense in depths concept of MS.			Yes	In the sentence before the one which the reviewer wants to change it is stated that: ensure that safety systems and safety features perform their functions in all operational states in design basis accidents (DBAs) and in design extension conditions (DEC) for which they are *necessary*. The key word is "necessary". If equipment is necessary in order to cope with DBA and DEC events, they should be included in the OLCs.
2.	3.8 Line 6	… The justification for each of the OLCs should be substantiated by means of a written indication of the reason for its adoption and any relevant background information. These justifications should be readily available when necessary in particular in the main control room and emergency control centers related to the site/unit.	It would be helpful to give more guidance where the background information shall be available (at least).	Yes	These justifications should be readily available when necessary, for example in the main control room and in the technical support centre at the site.		
3.	5.3 Line 28	• Outlet steam temperature for the steam generator; • Steam and feed-water flow	The "steam flow, feedwater flow and quality" is misleading. There should be a	Yes	Simplified to: • Steam flow and pressure; • Feed-water flow		

		• ~~Feed-water flow and Quality (BWR);~~ • Steam pressure • Feed-water temperature and quality (BWR); • • Settings provided to initiate steam line isolation, turbine trip and feed-water isolation;	better wording. Just "Quality" should not be mentioned here. Feedwater temperature is mentioned in the next bullet point. If chemical properties of the feedwater should be mentioned, it could be done here.		and temperature (BWR);		
4.	6.2	The limits and conditions for normal operation should include limits on operating parameters, stipulations for minimum amount of operable equipment, minimum staffing levels, prescribed actions to be taken by the operating staff in the event of deviations from the established OLCs ~~and the time allowed to complete these actions.~~ including the time frame for potential recovering actions. The limits should also include parameters ~~that may be included in the licensing conditions,~~ such as the chemical composition of working media, their activity contents and limits on discharges of radioactive material to the environment.	In the last part of the first sentence "the time allowed to complete these actions" is mentioned. This may be misleading, for the resulting action to be taken if the first actions fail is missing. There might be other or more necessary resulting actions than just shut-down of the plant. In the second sentence the term "that may be included in the licensing conditions" is not necessary and should be deleted.	Yes	Last part of the first sentence: and the allowed time frame to recover from these situations. The proposed change in the second sentence is OK.		
5.	6.4	Given the higher associated risks during startup of the power plant after outages, the operability requirements for this operational state should be more stringent than those permitted for operational flexibility in power operation. Safety system equipment that is required for startup after outages or longer shut down conditions to be	Should be more precise when this additional demand for "extended" "availability requirements" has to be considered.			Yes	This is out of the scope of the DPP. Original text is clear.

		operable for startup should be specified.					
6.	7.4	The surveillance requirements should also cover activities to detect ageing and other forms of deterioration due to corrosion, fatigue and other mechanisms. Such activities will include non-destructive examination of passive systems and components as well as of systems explicitly covered by limits and conditions for normal operation. …	Add "and components" in second sentence. This to be sure that concealed piping etc. is also covered (see related ENSREG Aging Management Topical Peer Reviews). There are passive components in active systems that also should be included in the ageing management program.			Yes	This is out of the scope of the DPP.
7.	8.3.A	Operator aids including sketches, handwritten notes, curves and graphs, instructions, copies of procedures, prints, drawings, information tags and other information sources that are used routinely by operators to assist them in performing their assigned duties should be controlled by the operations department. More details can be found in Ref. Conduct of Operation at Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-2.14 [12].	Check reference to NS-G-2.14 for this might be changed caused by NS-G-2.14 review process, s. DS497G. Can it be that footnote 13 from NS-G-2.14 is used as reference here? In this case we suggest to formulate 8.3.A as footnote as well.			Yes	NS-G-2.14 is revised in the same package as NS-G-2.2.
8.	8.3.B	For anticipated operational occurrences and design basis accidents…	Clarification: please put "accident" in plural	Yes			
9.	8.3	New order: 8.2 -> 8.2 8.2.A -> 8.2.A First 8.3 -> 8.3	Para. 8.3 exists twice. Please renumber the second para. 8.3 and	Yes	Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff		

		Second 8.3 -> 8.4 8.3.A -> 8.4.A 8.3.B -> 8.4.B 8.4 -> 8.5 and so on up.	the following paragraphs. Additional info: Second 8.3: "When verbal and/or written instructions are used in operational practice at a nuclear power plant, administrative procedures should be in place to ensure that the verbal and/or written instructions do not diverge from the established OPs and do not compromise established OLCs."		in the final editing process.		
10.	8.6	Emergency operating procedures (EOPs) should be developed as event based, or symptom based and cover all operation modes, including reactor low power and shutdown modes. For DBAs, both approaches can be used, although symptom based procedures are preferable for the reasons stated in para. 8.120.	Para 8.10 explains why symptom based procedures are preferable.	Yes	Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff in the final editing process.		
11.	8.8.A	Mistake in location of this para in text	8.8.A should stay after para 8.7 and after para.8.8 Please order the paragraphs.	Yes	Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff in the final editing process.		
12.	8.8.A	… (a) Most of the automatic protection signals have been inhibited and there is a high number of alarms	Delete bullet (b). There will be no fuel handling, maintenance and periodic tests during emergencies.			Yes	Misunderstanding. The increased risk is the basis for having EOPs covering also fuel handling incidents

		normally activated in a shutdown mode; ~~(b) The increased risk of incidents due to human error during fuel handling, maintenance and periodic tests;~~ (c) The unavailability of systems due to maintenance; (d) The set of available instrumentation can be limited; (e) Manual actions can be required within a short period of time. …	But this can be reason for EOPs.				or other events that could affect fuel handling.

COMMENTS BY REVIEWER **Guide: NS-G-2.2** Reviewer: Mohammad Zare Country & Organization: Iran / INRA			Page 21 Date: 13/05/2019	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	3.2 Line 4	"These operational states should include starting up, power production, shutting down, maintenance, testing and refueling." Change to "Normal operation states should include starting up, power production, shutting down, maintenance, testing and refueling."	In line 4 "These operational states" is not clear. in line 2 "normal operation" and in line 4 "These operational states" have different meanings.	Yes	Normal operation states should include starting up, power operation, shutting down, shutdown, maintenance, testing and refuelling. Modified to be in line with the definition of Normal operation in the IAEA Safety Glossary (plant states)		
2.	FIG. II.1. Flow diagram for the developm ent of operating		Text and shapes need to correct.	Yes	To be adjusted by IAEA staff in the final editing process.		

	procedures						
3.	FIG. A–1. Interrelationship between a safety limit, a safety system setting and an operational limit.		Text and shapes need to correct.	Yes	To be adjusted by IAEA staff in the final editing process.		

COMMENTS BY REVIEWER **Guide: NS-G-2.2** Reviewer: ? Country & Organization: Japan / NRA			Page 22 Date: 09/05/2019	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	1.4	The purpose of this Safety Guide is to provide guidance on the development, content and implementation of OLCs and OPs. <u>In addition, the application of the recommendations of this safety guide will support the fostering of a strong safety culture.</u>	Clarification. There is no description in the main text how the compliance with OLCs and OPs works fostering a strong safety culture. Should be stated in the main body how to support the fostering of a strong safety culture.			Yes	If all IAEA Safety guides are applied at a NPP, that NPP will have a strong safety culture. There is no quick fix for this. "Thousands of words" will not be enough to explain. It must be a commitment and understanding by people that all IAEA guides are experience based and if applied without compromise will lead to excellence.
2.	3.14	When it is necessary to modify OLCs on a temporary basis, for example to perform physics tests	Verifying returning original state is essential			Yes	This is out of the scope of the DPP.

		on a new core, particular care should be taken to ensure that the effects of the change are analysed, and the modified state, although temporary, necessitates at least the same level of assessment and approval as a permanent modification. When a permanent approach is available as a reasonable alternative, this should be preferred to a temporary modification of an OLC. Additionally, care should be also taken to ensure that any temporary modification surely returns to the original nominal state.	for temporary modification.				
3.	5.3 The bullets	• Neutron flux and distribution (startup, intermediate and operating power ranges); • Rate of change of neutron flux; • Axial power distribution factor; • Power oscillation; • Reactivity protection devices; • Temperatures of fuel cladding, or fuel channel coolant; • Temperature of reactor coolant • Reactor core void fraction ~~ratio~~ (BWR); • Rate of change of temperature of reactor coolant; • Pressure of the reactor coolant system (including cold overpressure settings), • Reactor steam dome pressure (BWR); • Water level in reactor vessel, or pressurizer (varying with plant state and differing with reactor type);	Addition and correction for BWR parameters.	Yes	Void content (from NS-G-2.5 §2.4 Simplified to: • Steam flow and pressure; • Feed-water flow and temperature (BWR); Wet-well water level added.		

		• Reactor coolant flow and recirculation flow (BWR); • Rate of change of reactor coolant flow • Rate of change of recirculation flow (BWR); • Tripping of primary coolant circulation pump, or tripping of recirculation pump (BWR); • Intermediate cooling and ultimate heat sink; • Water level in the steam generator; • Inlet water temperature for the steam generator; • Outlet steam temperature for the steam generator; • Main s~~S~~team flow; ~~• Feed-water flow and Quality (BWR);~~ • Steam pressure • Feed-water flow and temperature ~~(BWR)~~; • Settings provided to initiate steam line isolation, turbine trip and feed-water isolation; • Closure of isolation valve for the main steam line; • Injection of emergency coolant; • Containment pressure; • Settings provided to initiate startup of spray systems, cooling systems and isolation systems for the containment; • Dry well pressure/temperature Wet well pressure /temperature / water level (BWR);					

COMMENTS BY REVIEWER **Guide: NS-G-2.2** Reviewer: ? Country & Organization: Poland / PGE EJ1			Page 25 Date: 15/04/2019	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	1.6/1	~~Section 2 indicates the relation between the fundamental safety objective and the OLCs.~~	There is no such section 2. Section 2 is deleted from the guide. All the rest of sections should be renumbered and all cross references between different sections should be fixed accordingly.	Yes	Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff in the final editing process.		
2.	3.3/3	3.3. The technical aspects of the OLCs should cover the limitations to be observed, as well as the operational requirements that structures, systems and components important to the safety of the nuclear power plant should satisfy to be able to perform their intended functions as assumed in the plant safety analysis report.	An editorial correction to ensure understanding.	Yes	The technical aspects of the OLCs should cover the limitations to be observed, as well as the operational requirements that structures, systems and components important to the safety of the nuclear power plant are ~~to be~~ able to perform their intended functions as assumed in the plant safety analysis report.		
3	3.5 (b), (c)	The OLCs in this draft safety guide revision are specified in accordance with SSR-2/2 Revision 1 and therefore cannot be modified unless relevant changes are introduced to the requirements document. It seems however that on the next revision of SSR-2/2 Revision 1 appropriate	• Re. interlocks: Not only safety systems but also safety-related interlocks (protective, permissive, etc.) play important role in ensuring plant safety. Therefore, it seems that these interlocks need to specified in OLCs, so that the control room			Yes	Interlocks for safety systems are included in the term *safety systems*. Safety-related equipment is part of a system important to safety but not part of a safety system. See IAEA Safety Glossary *plant equipment*.

		modifications to OLCs should be considered in particular: • to include safety-related interlocks, • to extend the limits and conditions for normal operation to the limits and conditions for operational states.	personnel are familiar with and have an easy access to that information. The interlocks are mentioned in many IAEA safety standards, in particular: NS-G-1.9 (sec. 4.154), NS-G-2.2 (sec. I.12), NS-G-2.3 (sec. 5.12, 6.1, 6.2), NS-G-2.5 (sec. 2.5.3, 3.4, 4.18-20, 6.5), NS-G-2.6 (sec. 4.26, 9.38), SSG-28 (sec. 3.33, 4.19, 4.24, A.2, A.3, A.5, A.6, A.9, A.12, A.13, A.17-19). • Re. limits and conditions for operational states: The limits and conditions should be specified not only for normal operation but should also cover the anticipated operational occurrences (AOOs) and certain specific plant conditions during maintenance, as: - safety criteria related to fuel and plant component conditions, and off-site radioactive discharges, in fact are not relaxed for AOOs compared to				Limits for normal operations are probably exceeded during anticipated occurrences, which are the second part of the operational states. See IAEA Safety Glossary *plant states*.

			normal operating conditions, - certain specific plant conditions during maintenance such as "half-loop operation" should be also covered.				
4	3.11/2	3.11. It is also essential that the OLCs be meaningful to the responsible operating personnel and be defined by measurable or directly identifiable values of parameters, procedures or organizational arrangements (including minimal on-shift plant staffing).	Not all OLCs can be expressed by "measurable or directly identifiable values of parameters": items 3.5 (d) and 3.5 (e) cannot.			Yes	3.5 (d) is a measurable item, normally time intervals between tests. 3.5e are exceeded defined limits or safety system actuations, both identifiable and/or measurable.
5	3.13/3	(…) Any modification to the OLCs should be subject to assessment and approval by the operating organization following the established procedures at the plant, and then approval by the regulatory body as required. (…)	It is unclear why the clause on approval of OLCs modifications by a regulatory body has been deleted from sec. 3.13 of NS-G-2.2? As OLCs play a very important role in ensuring the plant safety it is a normal practice that any modifications proposed to them need to be approved by the nuclear regulator.			Yes	Please, see DDP: "All references to the involvement of regulators in the operational activities (commissioning, maintenance, operation, modification, etc.) currently available in the operational safety guides should be deleted."
6	4.1.3/3	4.1. The concept of safety limits is based on the prevention of unacceptable releases of radioactive materials from the plant through the application of limits imposed on the temperatures of fuel and fuel cladding, critical heat transfer	Not only temperatures but also critical heat transfer parameters in the reactor core are important for ensuring safety.			Yes	Of course, is DNBR and CPR important, but still it is in the concept of 4.1 to detailed information.

		parameters (DNBR, CPR), coolant pressure, (…)					
7	5.3	The following are typical parameters, operational occurrences and protective system devices for which safety system settings are necessary…	**Current list is a mix of parameters, devices/systems and actions/occurrences**. Telling that some device/system should have a setting formally doesn't tell us nothing and leaves unclear for which parameter this settings should be set. Same is with actions and occurrences. 1) The list of measurable parameters for which safety settings are necessary should be separated from current mixed list and provided in standalone list/paragraph. Clarification should be provided regarding indirectly measured parameters. 2) The list of devices and systems should be separated from current mixed list and provided in standalone list/paragraph. Clarification should be provided regarding parameters which should be measured by these devices and which settings must be set in these devices/systems.			Yes	This is a guide, not an instruction on how to design an NPP. The list in 5.3 are examples. This is very clear reading 5.4.

			3) Clarification regarding settings and their triggers/triggering parameters as well as assigning to relevant or separate actions, occurrence list should be provided for all the named occurrences.				
8	5.3/24	Clarification is needed on the item below: • Intermediate cooling and ultimate heat sink;	1) It is unclear what does "intermediate cooling" stands for - the component cooling water system or something else? 2) What specific safety system settings (parameters) related to these systems are to be applied? Flowrate or something else?			Yes	Intermediate cooling is the cooling system between the primary circuit and the ultimate heat sink. Basic NPP knowledge.
9	5.3/26	• Inlet feed-water temperature for the steam generator;	"Inlet water" need to be specified, this is probably about feed-water.	Yes			
10	5.3/28, 30	• Main s~~S~~team flow • Main s~~S~~team pressure	"Steam" need to be specified, this is probably about main steam.	Yes			
11	5.3/29	• Feed-water flow and Quality (BWR);	• A bullet sign was missing. • What does "Quality" mean here?	Yes	Corrected. "Quality" removed.		
12	5.3/39	• Dry well pressure/temperature (BWR)	In practice, also the term "dry-well" is used for BWRs only.	Yes			
13	5.3/46	• Radioactivity level in exhaust air at the stack and waste water at ???	It is unclear where this "radioactivity level" is to be measured? In case of exhaust air probably at the	Yes	Outlets added at the end.		

			stack or inlet to it, but where in case of waste water?				
14	5.3/47	• Loss of normal and back-up electrical power supply;	The loss of normal electrical supply is not a safety issue if back-up power supply from another off-site source is available.			Yes	Loss of normal electrical supply is a safety issue because it requires the emergency diesels, or equivalent, to start.
15	5.3/48	• Emergency power supply;	It is unclear what this is about: an initiation or failure/loss of emergency power supply?	Yes	Loss of emergency power supply.		
16	5.4/1	The actions to be initiated as described in para. 5.1 ~~for the items listed here~~ in case if limiting safety system settings, listed in paragraph 5.3, are triggered may vary according to reactor type and design	1) It is unclear what are considered here as "items". 2) It is unclear where those "items" are listed, but definitely not "here". It is suggested, that by "items" was considered "limiting safety system settings" and the correct reference to the list should be redirected to paragraph 5.3	Yes	New text: 5.4. The actions to be initiated, as described in para. 5.1, in case of exceeded safety system limits or equipment failures, listed in paragraph 5.3, may vary according to reactor type and design, or some of the settings may not be applicable.		
17	6, 6.1/1 7.1/2 7.4/4	Limits and conditions should be formulated rather for operational states than for normal operation, but this would require a previous change to SSR-2/2 Revision 1 (this is a subject for consideration in the next revision of this requirement document). 6. LIMITS AND CONDITIONS FOR NORMAL OPERATION	See the comment on sec. 3.5 above. Fig. A-1 just illustrates that the limits in fact are applied for operational states (including normal operation and AOOs), as a margin for AOOs is provided between the operational limit and the safety system setting to			Yes	No support for this idea in SSR-2/2 Revision 1 or the definition of plant states in the IAEA Safety Glossary.

		6.1. Limits and conditions for normal operation are intended to ensure safe operation; that is, to ensure that the assumptions of the safety analysis report are valid and that established safety limits are not exceeded in the operation of the plant. In addition, acceptable margins should be ensured between the normal operating values and the established safety system settings to avoid undesirably frequent actuation of safety systems. Figure A–1 in the Annex demonstrates a correlation between safety limits, safety system settings and limits for normal operation. 7.1. In order to ensure that safety system settings and limits and conditions for normal operation are met at all times, (…). 7.4. (…) Such activities will include non-destructive examination of passive systems as well as of systems explicitly covered by limits and conditions for normal operation. (…).	limit safety system actuations in transients.				
18	6.3/1 6.4/2	6.3. Operability requirements should state for the various modes ~~operational states~~ of normal operation (…). 6.4. Given the higher associated risks during startup of the power plant after out- ages, the operability requirements for this	Improper wording, inconsistent with the meaning of the term "operational states" which according to the IAEA Safety Glossary (2016) includes normal operation and anticipated			Yes	On the contrary: The IAEA Safety Glossary tells: the operational states under normal operation includes startup, power operation, shutting down, shutdown, maintenance, testing and refuelling.

		operational mode ~~state~~ should be more stringent (…).	operational occurrences (AOOs).				
19	6.9/1	Appendix I presents the ~~items~~ description of: a) parameters for which operating limits are required to be defined/set and b) conditions for normal operation of systems, structures and components which are generally necessary…	It is unclear what "items" are considered here and what is called by "items" in Appendix I. It should be noted, that according to IAEA glossary by "items" is called SSC's important to safety. Meanwhile Appendix I presents the chaotic mix of requirements, parameters, devices, systems occurrences and actions. In this particular case it should be clarified that limiting safety settings are applied for the controlled/monitored parameters and conditions for normal operation are defined for SSCs.	Yes	Appendix I presents the items description of: a) parameters for which operating limits are required to be defined or set and b) conditions for normal operation of systems, structures and components which are generally necessary.		
20	7.2/3	7.2. (…) The frequency of the surveillance tests should take into account the safety importance of the equipment that is reflected in safety categorization and classification, and should be based on (…).	The safety importance of particular plant SSCs is reflected in safety categorization and classification and this should be clearly noted here.			Yes	This is out of the scope of the DPP.
21	8.1.A/3	(…) and severe accident management guidelines (SAMG) for postulated severe accidents ~~emergencies~~, (…).	The term "postulated emergencies" is not defined neither in the IAEA Safety Standards nor in the Safety Glossary, and it should be rather used in the meaning	Yes	The words: "for postulated emergencies" is deleted (not needed).	Yes	By the way, is accident management and guidelines mentioned in requirement 19 and encompasses all accident conditions. The fact that the abbreviation "SAMG" is not explicitly

			of "radiological emergencies". The wording "postulated *nuclear or radiological emergency"* appears in the Safety Glossary (2016) only once, in explanations of the term "emergency plan". Instead, the wording "postulated accident" is frequently used some regulations, for instance in the US NRC Regulations (10CFR50), and in the Finnish Decree 717/2013. The "postulated severe accidents" should be then understood as severe accidents considered in the plant design and postulated for emergency response. By the way: the SAMGs are not specifically mentioned in SSR-2/2 Revision 1 (!)				used in SSR-2/2 Revision 1 does not exclude that it is a fit abbreviation to be used in the guides.
22	8.2/5, 7	8.2. Ref.[1] states that "all activities important to safety shall be carried out in accordance with procedures to ensure that the plant is operated within the OLCs". (…) instructions for the safe conduct of all modes of normal operation, such as starting up, power production, shutting down, shutdown, load changes,	A point was missing at the end of the first sentence. Obviously, the process monitoring is not a mode of normal operation. The term "beyond design accidents" since 2012 has been replaced in the IAEA Safety Standards on NPPs with DEC and	Yes			

		~~process monitoring~~ and fuel handling. (…) in all plant states, including systems, equipment or components used in plant states more severe than ~~beyond~~ design basis accidents.	beyond DEC plant states (see: SSR-2/1 - Definitions, Safety Glossary 2016, GSR Part 7 – Table 1).				
23	8.3.B/1	8.3.B For anticipated operational occurrences and design basis accidents, (…)	Editorial correction	Yes	Several reviewers have noticed that an "s" is missing. That's good!		
24	8.6/4	For DBAs, both approaches can be used, although symptom based procedures are preferable for the reasons stated in para. 8.12 [?]…	It should be noted, that paragraph 8.12 does not provided any reasons, why symptom based EOPs should be preferable against event based EOPs. Capability easy to distinguish EOPs from other plant procedures (as written in paragraph 8.12) is not the argument for the symptom based procedures preference. The reference to the more relevant paragraph (8.10 ?) should be provided or clarification of the reasons should be added directly to the paragraph 8.6.	Yes	Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff in the final editing process.		
25	8.8.A	8.8.A EOPs should also cover the locations where spent fuel is handled and stored~~,~~. (…). This section number should be changed to 8.6.A. In addition, the coma at the end of the first sentence needs to be deleted.	Editorial correction	Yes	The comma is deleted. Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff in the final editing process.		

26	8.9 (b)/2	(b) (…) and un-analysed accidents ~~beyond the design basis~~ are outside the scope of the procedures;	The wording "accidents beyond the design basis" is inconsistent with plant states as defined in the IAEA SSR-2/1 Revision 1 and Safety Glossary (2016). Unfortunately, in the SSR-2/2 Revision 1 neither the terms DEC nor SAMGs are used. Instead in sec. 5.8 to 5.8 the wordings "accident management programme" and "accidents more severe than design basis accidents" are used. This is one more (and quite significant) reason for revising the SSR-2/2 Revision 1 document. Having in view these inconsistences in terminology one solution is to delete the wording "beyond the design basis", or alternatively to replace "the design basis" with "DEC".	Yes	"accidents beyond the design basis" is replaced with "design extension conditions".		
27	8.16/1	from the [SEP]accident	Unknown artifact in the text should be removed.	Yes			
28	8.18.A	~~8.18.A Deleted~~	**General comment.** Since this is new release of safety guide all insertion of new paragraphs or deletion of certain chapters/paragraphs should be numerically	Yes	Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff in the final editing process.		

			aligned and fixed in final document edition. Empty paragraphs should not be marked as deleted but should be physically deleted from the text. The rest of paragraphs should be renumbered continuously without using any supplementing letters. Accordingly, all the cross reference among paragraphs should be checked in final document edition.		This editing includes the removal of deleted paragraphs.		
29	8.18.B	SAMGs should cover spent fuel storage facilities, reactor nominal and low power operation and shutdown modes and should be suitable to manage severe accidents that simultaneously affect the reactor and spent fuel.	Paragraph requires clarification. 1) It is unclear how SAMGs should cover spent fuel. It is proposed to clarify that SAMGs should cover, for example, spent fuel interim on-site storage facility or/and spend fuel storage pools in the reactor building. 2) It is unclear why "nominal power operation mode / normal operation" was excluded from the list of initial conditions / modes before potential severe accident. SAMGs should cover reactor nominal power operation modes as well.	Yes	New text: SAMGs should cover all modes and states of operation and all fuel locations, including the spent fuel pool and in on-site dry storage if applicable. The SAMGs should be suitable to manage severe accidents that simultaneously affect the fuel in the reactor and in spent fuel storage facilities. SSG-54 2.11 and 2.37.		

30	8.18.F/3, 4	8.18.F (…) in DEC or conditions beyond DEC ~~during a severe accident and/or a design extension condition~~. (…).	Inconsistency in wording again. Severe accidents (with core melting / significant core degradation) may be either those considered in DEC or conditions that are beyond DEC.	Yes			
31	9.4/2	Persons with appropriate competence and experience should be assigned to ~~draw up~~ develop and verify procedures. Persons who verifies procedure should not be the ones involved in procedure development.	Common experience and good practice show, that persons who verifies developed procedure should not be the ones, directly involved in the procedure development. Also, it should be noted, that procedure validation and verification process itself might require a procedure or a certain guidance / checklist. There might be few steps of operating procedure (OP) verification starting from procedure "paper" review, testing procedure applicability on the reactor simulator / equipment mockup, etc. and ending by "cold" and "hot" tests. It is proposed to supplement the guidance by additional clarifications regarding developed operating procedures verification process (this is also	Yes	New sentence changed to: Persons who verifies procedure should not be the ones involved in the process of development.		

			relevant to Appendix II paragraphs II.3-II.5).				
32	9.6 (f)/3	(f) The use of EOPs for dealing with accident conditions, including DBA and DEC without significant core degradation, and the use of SAMGs for management of severe accidents ~~(beyond design basis accidents)~~.	Another inconsistency in wording – see the comment above on sec. 8.18.F	Yes	The parentheses were already removed.		
33	10.	10. COMPLIANCE WITH OPERATIONAL LIMITS AND CONDITIONS AND OPERATING PROCEDURES This chapter should clearly refer to item 3.5 (e) "Action statements for deviations from the OLCs" and typical contents of such statements should be specified here. Please then consider some re-edition or/and extension of this chapter to address this issue in clear and comprehensive way.	The OLCs items (a) to (d) listed in sec. 3.5 are broadly discussed in respective chapters 4 to 7 which have the same titles as those items. However, in case of the "action statements for deviations from the OLCs" a clear reference to item 3.5 (e) and consistent description of this issue is missing. In fact, some relevant texts are contained in paras. 10.3 and 10.6 (in particular items (h) to (j)) of this chapter, but there is no subtitle "action statements for deviations from the OLCs" or a clear reference to item 3.5 (e).			Yes	I see no need to make references from chapter 10 to 3.5. Guidance on the actions that needs to be taken when limits are exceeded or if equipment is inoperable are provided in sections 5 and 6. There is no need to repeat them in section 10.
34	10.2	"…If possible, operational limits should be legibly indicated on instruments and displays so as to facilitate compliance…"	It should be noted, that: 1) Instruments and displays must indicate actual parameter value. 2) **Operator should not perform any indicated parameters correction in**			Yes	This is more conduct of operation NS-G-2.14 or design (SSR-2/1).

			head, considering factors what were not reflected in instruments parameters display scale. 3) Operational limits and settings should be set for the actual parameters values in adjusted instruments parameters display scale. For example, a pressure measurement in separator, steam generator or deaerator might require pressure value showings correction by the certain Δp depending from the equipment location height in order to get actual pressure value. Otherwise all the necessary indicated by devices parameters values corrections shall be stated in the OPs and marked on instruments and device scale. This issue with measured parameters values correction on devices display should be clarified in the safety guide.				
35	10.6/4	(…) Typical documents and records relating to compliance with or deviations from the OLCs are as follows:	Editorial correction.	Yes			

36	Appendix I	**SELECTION OF LIMITS AND CONDITIONS FOR NORMAL OPERATION**	General editorial comment Appendix I presents the chaotic mix of requirements, parameters, devices, systems, occurrences, actions. It is recommended to review the way of content presentation in the Appendix I and to unify provided information from the perspective of the parameters for which limits should be set and SSCs for which conditions for normal operation are necessary to be defined. At least the structure of subchapters and titles for same level subchapters should be unified clearly naming the relevant system for which description is provided. For example, “Core Cooling”, “Reactivity Control” are not the names of SSCs, but definition of necessary actions while other same level subchapters are titled according to relevant system.			Yes	No other country has made such broad comment on Appendix I. This implies that most reviewers acknowledge that it at large is OK. The Polish and other countries reviewers detailed comments on appendix I have been properly and individually evaluated and accepted or rejected case-by-case.
37	Appendix I /I.1	The minimum negative reactivity in the reactivity control devices available for insertion should be such that the	The minimum negative reactivity available for insertion in order to reach necessary degree of sub-	Yes	Only the words: taking into account the single failure criterion have been added.		

		degree of sub-criticality assumed in the safety analysis report can be reached immediately after shutdown from any operational state and in any relevant accident conditions taking into account single failure of most efficient control device (control device with most negative reactivity).	criticality should be defined considering single failure of most efficient control device / control rod.				
38	Appendix I /I.3	Limits on temperature reactivity effect, xenon concentration and other transient reactivity effects should be specified so that the specified degree of sub-criticality (?) for an indefinite period of time after shutdown ~~can~~ shall be maintained by normal reactivity control devices. ~~the~~ The use of borated water or other neutron absorbers shall be considered if the temperature reactivity effect, xenon concentration or other transient reactivity effects cannot be compensated for by normal reactivity control devices.	1) Seems that not the temperature itself should be limited, but the value of temperature reactivity effect including moderator temperature reactivity effect and nuclear fuel Doppler effect. 2) It is unclear what specified degree of sub-criticality for an indefinite period of time after shutdown shall be maintained. The value of sub-criticality after shutdown is one of the most important parameters for nuclear safety and historically was always clear defined in the safety documentation. 3) Priorities of requirements are misplaced. 1st of all required level (degree) of sub-criticality shall be maintained by	Yes	I.3 have been reworded to: Limits on the temperature reactivity coefficient, xenon concentration and other transient reactivity effects should be specified so that sub-criticality can be maintained for an indefinite period of time after shutdown by the use of borated water or other neutron absorbers if the temperature, xenon concentration or other transient reactivity effects cannot be compensated for by normal reactivity control devices.		

			normal reactivity control devices. Only if required level (degree) of sub-criticality cannot be maintained by normal reactivity control devices, the use of borated water or other neutron absorbers might be considered. For PWR reactors usage of borated water to maintain sub-criticality will require: a) boron concentration control in water, b) establishing a limit for boron concentration in water. Mentioned above issues should be clarified in the safety guide.				
39	Appendix I / I.36	The criteria (?) for fresh fuel storage should be stated. Any special measures to prevent criticality in fresh fuel during handling or storage should also be stated. When required (?), fuel enrichment should also be verified before insertion into the core (?).	1) It is unclear which criteria for fresh fuel storage should be stated. Proper clarification or typical examples of these "criteria" should be provided. 2) It is unclear, how fresh fuel enrichment can be verified at the Nuclear Power Plant, as well as when it might be required. Fuel enrichment verification by indestructible or destructible methods require mass spectrometry	Yes	Criteria changed to conditions. The last sentence is deleted (about enrichment verification) and replaced by: Fresh fuel manufacturing data should be checked against specification.		

			or other special laboratory equipment and can be performed only in scientific research institutes or accredited laboratories. Proper clarification should be added in the guide how to verify fresh fuel enrichment at the nuclear power plant before fuel insertion in the core. The description of relevant system and instrumentation for fuel enrichment verification should be provided.				
40	Appendix II / II.2	II.2. The drafting of operating procedures (Box 1) should normally be done by the relevant system, component, instruments or equipment operating group. The main documents used as references should include: (a) Documents containing design assumptions and intentions as well as systems, components and equipment technical specifications; (b) Contractual documents from the contractors giving guidance on the operation of systems and components; (c) System, component, equipment fabricators and software/hardware suppliers instructions and manuals of operation and maintenance of	1) Common practice is that operating procedures are prepared and drafted by operating staff / group who will be in future responsible for relevant SSCs, equipment or instrument operation or maintenance. This should be clarified in the guide. 2) One of the main reference source for operating procedures preparation should be instructions, manuals and technical specifications provided by system, equipment, hardware and software manufacturers and suppliers.	Yes		Yes	I disagree. It is normally the operating staff that drafts the Ops. a) This is included in b. b) Sentence changed to include relevant equipment specifications. c) This is included in b.

		relevant system, component or equipment. ~~(c)~~ (d) Commissioning documents Ref.[5]; ~~(d)~~ (e) Documents containing procedures from other plants of the same or similar types.	It looks like this is not completely covered by item (b) and requires separate indication.				
41	Appendix II / FIG II.1	FIG II.1 is distorted and hardly legible.	Editorial fault	Yes	The figure will be corrected by IAEA staff in the final editing process.		
42	Annex / FIG. A-1	FIG. A–1 is badly damaged/distorted and practically illegible.	Editorial fault	Yes	The figure will be corrected by IAEA staff in the final editing process.		
43	References/ [11]	[11] INTERNATIONAL ATOMIC ENERGY AGENCY, ~~Severe~~ Accident Management Programmes for Nuclear Power Plants, IAEA Safety Standards Series No. SSG-54 ~~NS-G-2.15~~, IAEA, Vienna (2019) ~~Under Revision~~	The revised document has been already issued.	Yes			

COMMENTS BY REVIEWER **Guide: NS-G-2.2** Reviewer: Rogatov D., Sviridov D. Page 44 Country & Organization: Russian Federation / SEC NRS Date: 29/04/2019				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	6.	It's proposed to add next sentences in para 6: "NPP design shall establish requirements of media chemistry in the NPP systems and elements that shall be met in operation to maintain physical barriers integrity on the path of radiation and radioactive	Text enhancement			Yes	There is no paragraph 6 in NS-G-2.2. The proposed new text does not fit anywhere else. Is the comment on another guide?

		substances release into the environment.”					

COMMENTS BY REVIEWER **Guide: NS-G-2.2** Reviewer: ? Page 45 Country & Organization: South Africa / National Nuclear Regulator Date: 13/05/2019				RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	1.5	1.5. This Safety Guide covers the concept of OLCs, their content as applicable to ~~land based stationary power plants with thermal neutron reactors~~ nuclear power plants, and the responsibilities of the operating organization regarding their establishment, modification, compliance and documentation	To standardize between guides delete reference to “land based stationary power plants with thermal neutron reactors” and replace with “nuclear power plants.”	Yes	Needs to be modified also in NS-G-2.5 (Done).		
2.	1.6	~~Section 2 indicates the relation between the fundamental safety objective and the OLCs.~~	Delete first sentence of paragraph as section 2 has been deleted.	Yes			
3.	3.6 4th sentence	For this they should be ~~collected in one document~~ easily identified and preferably in a single document for control room use	Propose to reword to not make it mandatory for all OLC to be in 1 document. OLC’s can be distributed between a selection of documents, together they form the OLC’s. As example if they are categorized per plant state, i.e. a document for each plant state.	Yes			
4.	8.6 2nd sentence	For DBAs, both approaches can be used, although symptom based procedures are preferable for the reasons stated in para. 8.10 ~~8.12~~.	Correct reference to 8.10.	Yes			

5.	8.6 4th sentence	EOPs should cover both design basis accidents and design extension conditions - without ~~significant~~ fuel degradation.	Since EOP's are preventative of nature, i.e. contain actions to prevent core damage it is proposed to delete significant.			Yes	*Without significant fuel degradation* is the plant state defined in the IAEA Safety Glossary.
6.	8.18.F	The means of making interconnections between units should be addressed in the SAMGs.	It is proposed to expand the practice of interconnection between units to the earlier EOP phase. It should be allowed to use unit interconnect based on a risk assessment for the unaffected units when it is predicted that core damage is imminent on the affected unit, thus preventing core damage and the implementation of SAMG's.			Yes	To expand the practice of interconnection between units to be decided by control room staff is not OK. Such decisions should be taken at a higher level, considering the effects on more than one unit. Also, SAMGs should be used when core damage is imminent (SSG-54).
7.	9.6 (f)	The use of EOPs for dealing with accident conditions, including DBA and DEC without ~~significant~~ core degradation, and the use of SAMGs for management of severe accidents (beyond design basis accidents).	Refer to Comment 5 above			Yes	See response to comment 5 above.
8.	10.1	For multiunit plants, it is preferred that OLCs should not be presented for more than one unit in a single document.	Propose to include "it is preferred that" since it is possible to have OLC's for multiple units in 1 document if the units are identical.			Yes	Even if the units are identically, they are normally tagged differently and equipment identities are most probably different.

COMMENTS BY REVIEWER				RESOLUTION			
Guide: NS-G-2.2 Reviewer: ? Country & Organization: UK - ONR			Page 47 Date: 18/04/2019				
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	3.15	Examples of changes to plant could be provided such as “replacement of equipment, environmental effects on equipment, and ageing”	Ensures safety case etc remains relevant	Yes			
2.	8.2.A	Additional words added to sentence "…carried out by the operator, PRIOR TO COMMENCEMENT OF THE NEXT STEP"	To prevent jumping forward to next step.	Yes			
3.	8.18.B	Additional word "SAMGs should ALSO cover…"	Without the extra word, it could be implied that SAMGs only cover those items detailed in the original form of this sentence.	Yes			
4.	8.18.E	Additional text "ensure the safe operation in other units (if appropriate, by placing them in safe, shutdown state) …"	Safe operation does include shutdown operational states, but there is a potential for a reader to assume safe operation is power generation. The EOPs and SAMGs should have inform the appropriate actions for other units, which may or may not be to shut them down.	Yes	The following words have been added at the end of 8.18E: and if appropriate, placing them in safe, shutdown state. (at the end to avoid parenthesis in the sentence).		
5.	9.6 (b)b	Additional text ".to avoid omissions, CONFLICTING	Self-explanatory	Yes			

		INSTRUCTIONS and duplication."					
6.	10.6 (f)	Should also include records of any training or briefings to operators of amended operating instructions.	To verify staff are cognisant with modifications.	Yes	New bullet “g” added: Records of training or briefings to operators of amended operating instructions.		

COMMENTS BY REVIEWER **Guide: NS-G-2.2** Reviewer: ? Country & Organization: USA - NRC			Page 48 Date: May 2019	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	Reference section	EUROPEAN COMMISSION, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANIZATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, UNITED NATIONS ENVIRONMENT PROGRAMME, WORLD HEALTH ORGANIZATION, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, IAEA Safety Standards Series No. GSR Part 3, IAEA, Vienna (2014).	Completion: Recognize all of the sponsors; and provide consistency with other safety guides.	Yes			

COMMENTS BY REVIEWER				RESOLUTION			
Guide: NS-G-2.2 Reviewer: Ahmed Nawaz Country & Organization: Pakistan			Page 49 Date: 26/06/2019 Deadline: 31/05/2019				
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	3.6	… "For this they should be collected in one document for control room use" May be deleted.	In some member states some OLCs are controlled by regulators whereas others are controlled by the utility and accordingly these are separate documents. Also 10.1 states "some OLCs may be directly stated in procedure or other documents…	Yes	Sentence already modified, "not necessarily in one document" in response to a comment by South Africa.		
2.	3.15	OLCs should be modified based on Safety analysis update to ensure that they remain applicable for their intended purpose …. And changes in the plant	As OLCs are based on Safety analysis so isolated periodic review would not be useful.			Yes	3.15 is in line with paragraph 4.8 in the SSR-2/2 Revision 1.
3.	6.5	After an anticipated operational occurrence, if OLCs have been exceeded, the cause should be determined, evaluated and appropriate remedial actions should be taken to provide assurance that it is safety to resume operation	To be more specific with regards to OLCs.			Yes	Determination of cause etc. should be performed regardless of if the OLCs have been exceeded or not (SSR-2/2 Revision 1 paragraph 4.31). Determination of cause should be performed if OLC limits are exceeded (SSR-2/2 Revision 1 paragraph 4.13).
4.	8.1.A	"The OLCs should be …. [16]" may be deleted.	Not relevant with the section's OPERATING PROCEDURES AND GUIDELINES, covered	Yes	OLCs should be OPs. It's a printing mistake made in one of the revisions of the guide.		

			in section 3.1 which is more appropriate.				

COMMENTS BY REVIEWER **Guide: NS-G-2.2** Reviewer: ? Country & Organization: India - ?			Page 50 Date: 08/08/2019 Deadline: 31/05/2019	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for rejection
1.	8.2	… in ~~beyond design basis accidents~~ Design Extension Conditions (DEC).	The term BDBA has been replaced by Design Extension Conditions (DEC) in IAEA SSR-2/1.	Yes	Same as comment 22 from Poland.		
2.	8.6	… for the reasons stated in para. ~~8.12~~ 8.10.	The actual referred symptom based EOPs is para. 8.10 of the draft guide.	Yes	Fonts, paragraph numbering, spelling, etc. will be checked and corrected by IAEA staff in the final editing process.		
3.	8.8.A	… Depending on shutdown and spent fuel conditions…	Please add … Depending on shutdown mode and spent fuel conditions… for better clarity and understanding.			Yes	The sentence is not about the shutdown modes. The examples, a - e, are about different conditions that can exist during a shutdown.