DS462

Addenda to the IAEA Safety Requirements:

- GSR Part-1 on Governmental, Legal and Regulatory Framework for Safety
- NS-R-3 on Site Evaluation for Nuclear Installations
- SSR-2/1 on Safety of Nuclear Power plants: Design
- SSR-2/2 on Safety of Nuclear Power plants: Commissioning and Operation
- GSR Part 4 on Safety Assessment for Facilities and Activities

Status
STEP 8: Submission to the Member States for comments
Deadline for comments: 30 November 2013

Addendum to GSR Part 1

Lesson learned	Current text	Proposal for Member States consultation
2.1 Japanese Investigation Committee Interim Report *Report by Fukushima Nuclear Accident Independent Investigation Committee *Extraordinary CNS Meeting August 2012	Req. 4 - Independence of RB 2.8. To be effectively independent, the regulatory body shall have sufficient authority and sufficient staffing and shall have access to sufficient financial resources for the proper discharge of its assigned responsibilities. The regulatory body shall be able to make independent regulatory judgements and decisions, free from any undue influences that might compromise safety, such as pressures associated with changing political circumstances or economic conditions, or pressures from government departments or from other organizations. Furthermore, the regulatory body shall be able to give independent advice to government departments and governmental bodies on matters relating to the safety of facilities and activities.	Req. 4 - Independence of RB 2.8. To be effectively independent from undue influence in its decision making, the regulatory body shall: (a) have sufficient authority and sufficient staffing; (b) ~~and shall~~ have access to sufficient financial resources for the proper and timely discharge of its assigned responsibilities~~.~~; (c) ~~The regulatory body shall~~ be able to make independent regulatory judgements and regulatory decisions, throughout the whole life cycle of a facility or an activity, under both operational states and accident conditions; (d) be free from any ~~undue influences that might compromise safety, such as~~ pressure~~s~~ associated with changing political circumstances or economic conditions, or pressure~~s~~ from government departments, authorized parties or from other organizations~~.~~; (e) ~~Furthermore, the regulatory body shall~~ be able to give independent advice to government departments and governmental bodies on matters relating to the safety of facilities and activities.
Letter from Chairman of INSAG (24 August 2012) Underlying theme of several reports, though not explicit It is strongly	Req. 5: Prime responsibility for safety **The government shall expressly assign the prime responsibility for safety to the person or organization responsible for a facility or an activity, and shall confer on the regulatory body the authority to require such persons or organizations to comply with stipulated regulatory requirements, as well as to demonstrate such compliance**.	Req. 5: Prime responsibility for safety New para. After 2.15 2.15a Having prime responsibility for safety, the person or organization responsible for a facility or an activity must proactively search for, propose and implement reasonably practicable safety improvements taking into account progress in science and technology as well as relevant experience feedback.

recommended to emphasise the meaning of the Requirement		
2.2	Req. 8: Emergency preparedness and response 2.23. The government shall specify and shall assign clear responsibilities for decision making in an emergency, and shall make provision for effective liaison between authorized parties and competent authorities and for an effective means of communication.	Req. 8: Emergency preparedness and response 2.23. The government shall specify and shall assign clear responsibilities for timely decision making in an emergency, and shall make provision for effective coordination and communication ~~liaison~~ between authorized parties and response organizations. *~~competent authorities and for an effective means of communication.~~ * Ref. to the revision of GS-R-2 (GSR Part 7)
*Report by Fukushima Nuclear Accident Independent Investigation Committee *ONR Final Report *Ext. CNS Meeting August 2012	Req. 8: Emergency preparedness and response	Req. 8: Emergency preparedness and response New paragraph after 2.24 2.24a The government shall ensure that adequate training, drills and exercises are carried out regularly, involving authorized parties and response organizations, including decision makers, to contribute to an effective response to emergencies*. The training, drills and exercises shall cover a full range of potential emergencies (e.g. events affecting several facilities on a single site, long duration exercise and, if appropriate, transboundary emergencies). * Ref. to the revision of GS-R-2 (GSR Part 7)
*Report by Fukushima Nuclear Accident Independent Investigation	Req. 8: Emergency preparedness and response	Req. 8: Emergency preparedness and response New paragraph after 2.24 2.24b The government shall ensure that arrangements are in place to keep the public informed of the possible radiation risks due to accidents at facilities and activities and of arrangements for emergency preparedness and response. The arrangements shall

Committee *ONR Final Report *Ext. CNS Meeting August 2012		include information provided before start of operations, during and after operation until release from regulatory control and during any emergency*. * Ref. to the revision of GS-R-2 (GSR Part 7)
*Japanese Investigation Committee Interim Report *ONR Final Report *Ext. CNS Meeting August 2012	Req. 14: Int. obligations and arrangements for int. cooperation 3.2. The features of the global safety regime include: (a) International conventions that establish common obligations and mechanisms for ensuring protection and safety; (b) Codes of conduct that promote the adoption of good practices in the relevant facilities and activities; (c) Internationally agreed IAEA safety standards that promote the development and application of internationally harmonized safety requirements, guides and practices; (d) International peer reviews of the regulatory control and safety of facilities and activities, and mutual learning by participating States; (e) Multilateral and bilateral cooperation that enhances safety by means of harmonized approaches as well as increased quality and effectiveness of safety reviews and inspections.	Req. 14: Int. obligations and arrangements for int. cooperation 3.2. The features of the global safety regime include: […] (e) Regular ~~M~~multilateral and bilateral cooperation with relevant national organizations, that enhances safety by means of harmonized approaches as well as increased quality and effectiveness of safety reviews and inspections through knowledge and experience sharing (e.g. by developing networks).
A 5.1	Req. 14: Int. obligations and arrangements for int. cooperation **The government shall fulfil its respective international obligations, participate in the relevant international arrangements, including international peer reviews, and promote international cooperation to enhance safety global.**	Req. 14: Int. obligations and arrangements for int. cooperation **The government shall fulfil its respective international obligations, participate in the relevant international arrangements, including international peer reviews, and promote international cooperation and assistance to enhance safety global.** And new paragraph after 3.2

		3.2a The government shall ensure that adequate arrangements are in place to benefit from international cooperation and assistance during a nuclear or radiological emergency*. *Ref. to the revision of GS-R-2 (GSR Part 7)
4.1	Req. 21: Liaison between the RB and authorized parties 4.24. The regulatory body shall foster mutual understanding and respect on the part of authorized parties through frank, open and yet formal relationships, providing constructive liaison on safety related issues.	Req. 21: Liaison between the RB and authorized parties 4.24. The regulatory body shall foster mutual understanding and respect on the part of authorized parties through frank, open and yet formal relationships, providing constructive liaison on safety related issues and in-depth technical dialogue between experts of each party.
* Iter consult: Preliminary Report *ENSREG * NRC Task Force Report (implicit) *Ext. CNS Meeting August 2012 (implicit)	Req. 25: Review and assessment of information relevant to safety Req. 26: Graded approach to review and ass. of a facility or an activity	Req. 25 : Review and assessment of information relevant to safety New paragraph below the overarching requirement 26 Req. 26: Graded approach to review and ass. of a facility or an activity New paragraph above 4.40. 4.39a The Regulatory Body shall ensure that the authorized parties routinely perform operational experience reviews and periodically perform comprehensive safety reviews such as Periodic Safety Reviews for nuclear power plants*. These comprehensive safety reviews are submitted to assessment by the regulatory body, which shall ensure that any reasonably practicable safety improvements identified in the findings are implemented in a timely manner. *Include Ref. to SSR-2/2 requirement 12
5.1 *ENSREG Report *Japanese Investigation Committee	Req. 25: Review and assessment of information relevant to safety Req. 26: Graded approach to review and ass. of a facility or an activity 4.43. The regulatory body shall assess all radiation risks associated with normal operation, anticipated operational occurrences and accident conditions, prior to operation of the	Req. 25: Review and assessment of information relevant to safety Req. 26 : Graded approach to review and assessment of a facility or an activity 4.43. The regulatory body shall assess all radiation risks associated with normal operation, anticipated operational occurrences and accident conditions, including severe accidents, prior to operation of the facility or conduct of the activity, and periodically throughout the

Interim Report *NRC Task Force Report *ONR Final Report Also see Req. 1 / 2.5 (3)	facility or conduct of the activity, and periodically throughout the lifetime of the facility or the duration of the activity, to determine whether radiation risks are as low as reasonably achievable.	lifetime of the facility or the duration of the activity, to determine whether radiation risks are as low as reasonably achievable.
4.1	Req. 25: Review and assessment of information relevant to safety Req. 26: Graded approach to review and ass. of a facility or an activity	Req. 25: Review and assessment of information relevant to safety Req. 26: Graded approach to review and ass. of a facility or an activity New paragraph after 4.48 4.48aThe regulatory body shall encourage the authorized party to continuously search for safety improvements and implement reasonably practicable ones in line with the regulatory process without needing to be prompted or required to do so by the regulatory body.
*IAEA Mission on Remediation *ONR Final Report (implicit) *Ext. CNS Meeting August 2012 (implicit)	Req. 36: Communication and consultation with interested parties 4.66. The regulatory body shall establish, either directly or through authorized parties, provision for effective mechanisms of communication, and it shall hold meetings to inform interested parties and the public and for informing the decision making process. This communication shall include constructive liaison such as: […] (d) Communication on the requirements, judgements and decisions of the regulatory body, and on the bases for them, to the public; (e) Making information on incidents in facilities and activities, including accidents and abnormal occurrences, and other information, as appropriate, available to authorized parties, governmental bodies, national and international organizations, and the public.	Req. 36: Communication and consultation with interested parties New bullet in 4.66 (d) Communication on the requirements, judgements and decisions of the regulatory body, and on the bases for them, to the public; (e) Ensuring that the public is given appropriate opportunities to be consulted effectively in the process for making important regulatory decisions, in accordance with national legislation and international obligations. The results of these consultations shall be taken into account by the regulatory body in a transparent manner; (fe) Making information on incidents in facilities and activities, including accidents and abnormal occurrences, and other information, as appropriate, available to authorized parties, governmental bodies, national and international organizations, and the public.

	[…]	
A 6.2 * IAEA Mission on Remediation *Japanese Investigation Committee Interim Report * NRC Task Force Report *ONR Final Report *Ext. CNS Meeting August 2012 (implicit)	Req. 36: Communication and consultation with interested parties 4.68. The authorized party has an obligation to inform the public about the possible radiation risks associated with the operation of a facility or the conduct of an activity, and this obligation shall be specified in the regulations promulgated by the regulatory body, in the authorization or by other legal means.	Req. 36: Communication and consultation with interested parties 4.68. The authorized party has an obligation to inform the public about the possible radiation risks (under both operational states and accident conditions) associated with the operation of a facility or the conduct of an activity, and this obligation shall be specified in the regulations promulgated by the regulatory body, in the authorization or by other legal means.

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Addendum to NS-R-3

Lesson learned	Current text	**Proposal for Member States consultation**
Additional modification for consistency not related to Lessons Learned	1.9. Previous safety standards on this subject related to land based stationary thermal neutron power plants. This Safety Requirements publication has been extended to cover a more comprehensive range of nuclear installations: land based, stationary nuclear power plants and research reactors, as well as nuclear fuel cycle facilities, including but not limited to enrichment plants, processing plants, independent spent fuel storage facilities and reprocessing plants. In some instances in this publication a requirement is stated to apply to nuclear power plants. In these cases, the requirements are most appropriate for nuclear power plants, but they may also apply to other nuclear installations.	1.9. Previous safety standards on this subject related to land based, stationary thermal neutron power plants. This Safety Requirements publication has been extended to cover a more comprehensive range of nuclear installations*~~: land based, stationary nuclear power plants and research reactors, as well as nuclear fuel cycle facilities, including but not limited to enrichment plants, processing plants, independent spent fuel storage facilities and reprocessing plants~~. In some instances in this publication a requirement is stated to apply to nuclear power plants. In these cases, the requirements are most appropriate for nuclear power plants, but they may also apply to other nuclear installations. • Footnote referring to the revised definition of nuclear installations in the Safety Glossary
Additional modification for consistency not related to Lessons Learned	1.13. This publication is concerned mainly with severe events of low probability that relate to the siting of nuclear installations and that have to be considered in designing a particular nuclear installation. If events of lesser severity but higher probability make a significant contribution to the overall risk, they should also be considered in the design of the nuclear installation.	1.13. This publication is concerned mainly with severe events of low probability that relate to the siting of nuclear installations and that have to be considered in designing a particular nuclear installation. If events of lesser severity but higher probability make a significant contribution to the overall risk, they will~~should~~ also need to be considered in the design of the nuclear installation.
Additional modification for consistency not related		Changes from “should” to “shall” to be incorporated in 2.1, 2.7, 2.8, 2.11, 2.13, 2.15, 2.18 (two should), 2.20, 3.53, 4.8, 4.11, 4.14, 6.3, 6.4

to Lessons Learned		
Lessons learned *8.1*	2.5 Proposed sites for nuclear installations shall be examined with regard to the frequency and severity of external natural and human induced events and phenomena that could affect the safety of the installation.	2.5 Proposed sites for nuclear installations shall be ~~examined~~evaluated with regard to the frequency and severity of external natural and human induced events and credible combinations of these events~~phenomena~~ that could affect the safety of the installation. **New paragraph after 5.1:** 5.1a Site specific design and safety assessment parameters shall be periodically evaluated based on lessons learned, the updated information, knowledge and methodologies, and their safety implications shall be evaluated.
Lessons learned *8.1*	3.55. If the hazards for the nuclear installation are unacceptable and no practicable solution is available, the site shall be deemed unsuitable.	**Modify paragraph 3.55:** 3.55. If the hazards for the nuclear installation are unacceptable or~~and~~ no practicable solution is available for protection of the nuclear installation with sufficient margins, the site shall be deemed unsuitable or no longer suitable.
Lessons learned *8.1*	2.2. If the site evaluation for the three aspects cited indicates that the site is unacceptable and the deficiencies cannot be compensated for by means of design features, measures for site protection or administrative procedures, the site shall be deemed unsuitable.	2.2. If the site evaluation for the three aspects cited indicates that the site is unacceptable and the deficiencies cannot be compensated for by means of design features, measures for site protection or administrative procedures, the site shall be deemed unsuitable or no longer suitable. This applies also to 2.25, 2.28, 3.36, 3.40, 3.47, 3.50 and 3.51
Lessons learned *10.1*		**New paragraphs after 2.13** 2.13a. For nuclear power plants, the total nuclear capacity to be installed on the site shall be determined as far as possible at the first stages of the siting process. If the installed nuclear capacity is significantly increased to a level greater than that previously determined to be acceptable, the suitability of the site shall be re-evaluated, as appropriate. 2.13b For assessing the feasibility of the implementation of the emergency

		plans, all nuclear installations to be installed on the site shall be considered.
Lessons learned *10.1*	3.51. The region shall be investigated for installations (including installations within the site boundary) in which flammable, explosive, asphyxiant, toxic, corrosive or radioactive materials are stored, processed, transported and otherwise dealt with that, if released under normal or accident conditions, could jeopardize the safety of the installation. This investigation shall also include installations that may give rise to missiles of any type that could affect the safety of the nuclear installation. The potential effects of electromagnetic interference, eddy currents in the ground and the clogging of air or water inlets by debris shall also be evaluated. If the effects of such phenomena and occurrences would produce an unacceptable hazard and if no practicable solution is available, the site shall be deemed unsuitable.	***Modify existing para 3.51*** 3.51. The region shall be investigated for installations (including installations within the site boundary, including collocated NPP units) in which flammable, explosive, asphyxiant, toxic, corrosive or radioactive materials are stored, processed, transported and otherwise dealt with that, if released under normal or accident conditions, could jeopardize the safety of the installation. This investigation shall also include installations that may give rise to missiles of any type that could affect the safety of the nuclear installation. The potential effects of electromagnetic interference, eddy currents in the ground and the clogging of air or water inlets by debris shall also be evaluated. If the effects of such phenomena and occurrences would produce an unacceptable hazard and if no practicable solution is available, the site shall be deemed unsuitable or no longer suitable.
Lessons learned *10.1 & 11.1*	2.7. The hazards associated with external events that are to be considered in the design of the nuclear installation shall be determined. For an external event (or a combination of events) the parameters and the values of those parameters that are used to characterize the hazards should be chosen so that they can be used easily in the design of the installation. 3.21. The hazards for the site due to flooding shall be derived from the model.	***Modify existing paragraph 2.7:*** 2.7. The hazards associated with external events that are to be considered in the design of the nuclear installation and for its safety assessment shall be determined. For an external event (or a combination of events) the parameters and the values of those parameters that are used to characterize the hazards shallould be chosen so that they can be used easily in the design of the installation and for its safety assessment. ***Modify existing paragraph 3.21:*** 3.21. The hazards for the site due to flooding shall be derived from thesuitable models.
Lessons learned		**New paragraph after 2.5.** 2.5a From the characterization of the hazards resulting from external events:

12.1		- The frequency and the severity information shall be used in establishing the design basis hazard level for the nuclear installation; - Account shall be taken of uncertainties in the design basis hazard level.

Addendum to SSR-2/1

The review of the SSR2/1 requirements made in the light of the lessons learnt from Fukushima Daiichi accident has revealed some needs for adding and supplementing some requirements or simply to make some of them more explicit with regard to some issues. All the modifications proposed aim at either:

- Strengthening the prevention of unacceptable radiological consequences to the public and the environment (Req 2.13, 17, 33, 58, 67,68, 80) or
- Avoiding long term off site contamination should a severe accident occur (Req 2.13, 7, 17, 20, 68), or
- Preventing a severe accident through strengthening the plant design basis (Req 2.13, 17, 20, 32, 53, 68, 80),

Update of Plant State Definition

LL	Current text	Proposal for Member States consultation
N.A.	DEFINITIONS pg. 59	**Plant states (considered in design)** Operational states | Accident conditions (a) Normal operation | Anticipated operational occurrences | Design basis accidents | Design extension conditions No core melt | Severe Accidents (including Core melt) (a) Conditions practically eliminated

	DEFINITIONS pg. 59 **[beyond design basis accident]** This term is superseded by **design extension conditions**.	DEFINITIONS pg. 59 ~~**[beyond design basis accident]**~~ ~~This term is superseded by **design extension conditions**.~~
	P 60 Design extension conditions Accident conditions that are not considered for design basis accidents, but…… Design extension conditions could include severe accident conditions.	P 60 Design extension conditions Accident conditions that are not considered for design basis accidents, but…… Design extension conditions ~~could~~ include the severe accident conditions not practically eliminated..

LL	Current text	Proposal for Member States consultation
21.1	**Defence in depth** 2.13. Application of the concept of defence in depth in the design of a nuclear power plant provides several levels of defence (inherent features, equipment and procedures) aimed at preventing harmful effects of radiation on people and the environment, and ensuring adequate protection from harmful effects and mitigation of the consequences in the event that prevention fails. The independent effectiveness of each of the different levels of defence is an essential element of defence in depth at the plant and this is achieved by incorporating measures to avoid the failure of one level of defence causing the failure of other levels. There are five levels of defence:	**Defence in depth** 2.13. Application of the concept of defence in depth in the design of a nuclear power plant provides several levels of defence (inherent features, equipment and procedures) aimed at preventing harmful effects of radiation on people and the environment, and ensuring adequate protection from harmful effects and mitigation of the consequences in the event that prevention fails. ~~The independent effectiveness of each of the different levels of defence is an essential element of defence in depth at the plant and this is achieved by incorporating measures to avoid the failure of one level of defence causing the failure of other levels.~~ There are five levels of defence:
21.1	2.13. … (4) The purpose of the fourth level of defence is to mitigate the consequences of accidents that result from failure of the third level of defence in depth. The most important objective for this level is to ensure the confinement function, thus ensuring that radioactive releases are kept as low as reasonably achievable.	2.13. … (4) The purpose of the fourth level of defence is to mitigate the consequences of accidents that result from failure of the third level of defence in depth. Level four is aimed at preventing the progression of the accident and mitigating the consequences of a severe accident. In case of a severe accident, the most important objective for this level is to ensure the confinement function by limiting the radiological releases so that the protection of the people and environment is ensured by implementing protective measures limited in time

LL	Current text	Proposal for Member States consultation
	(5) The purpose of the fifth and final level of defence is to mitigate the radiological consequences of radioactive releases that could potentially result from accidents accident conditions. …	and areas. Level four includes additional features which are necessary for the practical elimination of sequences possibly leading to significant radioactive releases (footnote) (5) The purpose of the fifth and final level of defence is to mitigate the radiological consequences of radioactive releases that could potentially result from accidents …..~~conditions~~ 2.13 a The independent effectiveness of the different levels of defence is an essential element of defence in depth at the plant and is achieved by incorporating measures to avoid the failure of one level of defence causing the failure of other levels. Independence shall be implemented as far as practicable with a particular attention for levels three and four because of the enhanced severity of overall consequences if failures of these two levels occur simultaneously. Footnote: "Significant radioactive releases": Large or early releases for which protective measures limited in area and time are insufficient to protect the people and the environment.

LL	Current text	Proposal for Member States consultation
25.2	**Requirement 17: Internal and external hazards** **All foreseeable internal hazards and external hazards, including the potential for human induced events directly or indirectly to affect the safety of the nuclear power plant, shall be identified and their effects shall be evaluated. Hazards shall be considered for determination of the postulated initiating events and generated loadings for use in the design of relevant items important to safety for the plant.** 5.18 Items important to safety shall be designed and located to minimize, consistent with other safety requirements, the likelihood of external events and their possible harmful consequences.	**Requirement 17: Internal and external hazards** **All foreseeable internal hazards and external hazards, including the potential for human induced events directly or indirectly to affect the safety of the nuclear power plant, shall be identified and their effects shall be evaluated. Hazards shall be considered when establishing the plant layout and ~~for~~ determinating ~~determination of~~ the postulated initiating events and generated loadings for use in the design of relevant items important to safety for the plant.** 5.15 a (after Requirement 17) this is a move of 5.18 after 5.15. Items important to safety shall be designed and located, considering other safety implications, to limit their exposure to hazards and possible harmful consequences of their failures. ~~5.18 Items important to safety shall be designed and located to minimize, consistent with other safety requirements, the likelihood of external events and their possible harmful consequences.~~
19.1	**External hazards** 5.17. The design shall include due consideration of those natural and human induced external events (i.e. events of origin external to the plant) that have been identified in the site evaluation process. Natural external events shall be addressed, including meteorological, hydrological, geological and seismic events. Human induced external events arising	**External hazards** 5.17. The design shall include due consideration of those natural and human induced external events (i.e. events of origin external to the plant) that have been identified in the site evaluation process. Natural external events shall be addressed~~, including meteorological, hydrological, geological and seismic events~~. Human induced external events arising from nearby industries and transport routes shall be addressed. Causality and likelihood shall be considered

LL	Current text	Proposal for Member States consultation
	from nearby industries and transport routes shall be addressed. In the short term, the safety of the plant shall not be permitted to be dependent on the availability of off-site services such as electricity supply and fire fighting services. The design shall take due account of site specific conditions to determine the maximum delay time by which off-site services need to be available.	in postulating potential concurrent hazards. In the short term, the safety of the plant shall not be permitted to be dependent on the availability of off-site services such as electricity supply and fire fighting services. The design shall take due account of site specific conditions to determine the maximum delay time by which off-site services need to be available.
19.1	5.20 The design shall be such as to ensure that items important to safety are capable of withstanding the effects of external events considered in the design, and if not, other features such as passive barriers shall be provided to protect the plant and to ensure that the required safety function will be performed.	5.20 The design shall be such ~~as to ensure~~ that items that are necessary to fulfil the fundamental safety functions ~~important to safety~~ are either capable of withstanding the effects of external events considered in the design or protected from such effects by~~, and if not,~~ other features such as passive barriers ~~shall be provided to protect the plant and to ensure that the required safety function will be performed~~.
19.1	5.21. The seismic design of the plant shall provide for a sufficient safety margin to protect against seismic events and to avoid cliff edge effects (see footnote 5).	5.21 The design of items important to safety shall provide for adequate provisions or margins to avoid cliff edge effects to accommodate external hazards of a severity or duration moderately exceeding that derived from the site evaluation. For items ultimately necessary to prevent significant radiological releases, this requirement shall be fulfilled with significant margins.

LL	Current text	Proposal for Member States consultation
22.1	**Requirement 20 Design extension conditions** 5.29. The analysis undertaken shall include identification of the features that are designed for use in, or that are capable of preventing or mitigating, events considered in the design extension conditions. These features: (a) (b) (c)	**Requirement 20 Design extension conditions** 5.29. The analysis undertaken shall include identification of the features that are designed for use in, or that are capable of preventing or mitigating, events considered in the design extension conditions. These features: (a) (b) (c) **(d)** Shall include sufficient design margins to remain operational in conditions moderately more severe than those considered in their design basis to avoid cliff edge effects to occur
	Requirement 20 Design extension conditions 5.31. The design shall be such that design extension conditions that could lead to significant radioactive releases are practically eliminated (see footnote 1). If not,for design extension conditions that cannot be practically eliminated, only protective measures that are of limited scope in terms of area and time shall be necessary for protection of the public, and sufficient time shall be made available to implement these measures.	**Requirement 20 Design extension conditions** 5.31. The design shall be such that ~~design extension~~ conditions that could lead to significant radioactive releases are practically eliminated (see footnote 1). 5.31 a ~~If not, f~~For design extension conditions ~~that cannot be practically eliminated~~, only protective measures that are of limited scope in terms of area and time shall be necessary for protection of the public, and sufficient time shall be made available to implement these measures.

LL	Current text	Proposal for Member States consultation
25.2	**Requirement 32 Design for optimal operator performance** 5.55 The design shall support operating personnel in the fulfilment of their responsibilities……., to facilitate interaction between the operating personnel and the plant.	**Requirement 32 Design for optimal operator performance** 5.55 The design shall support operating personnel in the fulfilment of their responsibilities……., to facilitate interaction between the operating personnel and the plant in operational states and accident conditions.
25.1	**Requirement 33: Sharing of safety systems between multiple units of a nuclear power plant** **Safety systems shall not be shared between multiple units unless this contributes to enhanced safety.**	**Requirement 33: Sharing of safety systems between multiple units of a nuclear power plant** ~~**Safety systems shall not be shared between multiple units unless, in accident conditions, this contributes to enhanced safety for the units.**~~ **Each unit shall have its own systems important to safety to control and mitigate the anticipated operational occurrences and accidents considered for the design.** 5.63 In accident conditions, inter connecting support systems among the units is allowed if it can be justified that it facilitates the accident management of one unit by giving the possibility to restore a safety function. ~~Safety system support features and safety related items shall be permitted to be shared between several units of a nuclear power plant if this contributes to safety.~~ Such a sharing shall not be permitted if it would increase either the likelihood or the consequences of an accident at any unit of the plant.

LL	Current text	Proposal for Member States consultation
29.1	**Requirement 53: Heat transfer to an ultimate heat sink** **Systems shall be provided to transfer residual heat from items important to safety at the nuclear power plant to an ultimate heat sink. This function shall be carried out with very high levels of reliability for all plant states.**	6.19a (after Requirement 53) If a high level of reliability of the residual heat transfer to the ultimate heat sink cannot be demonstrated for all potential conditions generated by external hazards, alternative means shall be provided. These means, including the use of a different heat sink and the necessary associated features, shall be located and designed so that external hazards cannot result in the loss of the residual heat removal function.
21.2	**Requirement 58: Control of containment conditions** **Provision shall be made to control the pressure and temperature in the containment at a nuclear power plant and to control any build-up of fission products or other gaseous, liquid or solid substances that might be released inside the containment and that could affect the operation of systems important to safety.**	New paragraphs under Requirement 58 after 6.28 6.28 a The design shall include the necessary features to enable the use of non-permanent equipment to restore the containment cooling. The non-permanent equipment may be available at the site or not. 6.28.b The loss of the containment structural integrity shall be practically eliminated. This shall be achieved without significant radioactive releases.
46.3	**Requirement 67: Emergency control centre** **An on-site emergency control centre, separate from both the plant control room and the supplementary control room, shall be provided from which an emergency response can be directed at the nuclear power plant.**	**Requirement 67: ~~Emergency control~~ Technical support centre** (Foot note) **An on-site technical support centre, separate from both the plant control room and the supplementary control room, shall be implemented~~provided~~ from which technical support can be provided to the operation staff during accident conditions~~an emergency response can be directed at the nuclear~~**

LL	Current text	Proposal for Member States consultation
	6.42. Information about important plant parameters and radiological conditions at the nuclear power plant and in its immediate surroundings shall be provided in the on-site emergency control centre. The on-site emergency control centre shall provide means of communication with the control room, the supplementary control room and other important locations at the plant, and with on-site and off-site emergency response organizations. Appropriate measures shall be taken to protect the occupants of the emergency control centre for a protracted time against hazards resulting from accident conditions. The emergency control centre shall include the necessary systems and services to permit extended periods of occupation and operation by emergency response personnel.	~~power plant~~. Footnote: Other facilities for the management of emergencies such as the Emergency Centre are addressed in GSR Part 7: Emergency Preparedness and Response 6.42. Information about important plant parameters and radiological conditions at the nuclear power plant and in its immediate surroundings shall be provided in the on-site technical support centre~~emergency control centre~~. The on-site technical support centre ~~emergency control centre~~ shall provide means of communication with the control room, the supplementary control room and other important locations at the plant, and with on-site and off-site emergency response organizations. ~~Appropriate measures shall be taken to protect the occupants of the emergency control centre for a protracted time against hazards resulting from accident conditions. The emergency control centre shall include the necessary systems and services to permit extended periods of occupation and operation by emergency response personnel.~~ 6.42a The technical support centre shall remain operable and habitable for a protracted period of time in situations generated by accidents and hazards considered in the design of the plant. This requirement shall be fulfilled with significant margins. Paragraph 6.40 on Control room should also be modified to be consistent with 6.42a: 6.40a The control room shall remain operable and habitable for a protracted period of time in situations generated by accidents and hazards considered in the design of the plant. This requirement shall be fulfilled with significant

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		margins.
35.1, 46.16 and 46.17	**Requirement 68: Emergency power supply** **The emergency power supply at the nuclear power plant shall be capable of supplying the necessary power in anticipated operational occurrences and accident conditions, in the event of the loss of off-site power.**	**Requirement 68: Emergency power supply** **The emergency power supply at the nuclear power plant shall be capable of supplying the necessary power in anticipated operational occurrences and in design basis accidents in the event of the loss of off-site power. The design shall also include a dedicated power source to supply the necessary power in design extension conditions.** New paragraphs under Requirement 68, after 6.44 6.44 a The dedicated power source shall be capable of supplying the necessary power to prevent significant core and spent fuel degradation in the event of the loss of the off-site power combined with the failure of the emergency power source for design basis accidents. 6.44 b The dedicated power source shall be capable of supplying power to the equipment necessary to mitigate the consequences of design extension conditions involving a loss of the off-site power combined with the failure of the emergency power source for design basis accidents. 6.44 c Equipment necessary to mitigate the consequences of a core melt accident shall be supplied by any of the power sources. 6.44 d The dedicated power source shall be independent and physically separated from the emergency power source for design basis accidents. The

LL	Current text	Proposal for Member States consultation
		dedicated back-up power system connection time shall be consistent with battery autonomy. 6.44 e Continuity of DC power shall be ensured such that any short term actions necessary to mitigate the consequences of design extension conditions can be completed despite the loss of the AC power sources and the event that triggered it. New paragraphs under Requirement 68, after 6.45 6.45.a The design shall include the necessary features to enable the use of non-permanent power sources which may be available at the site or not.

LL	Current text	Proposal for Member States consultation
42.1	**Requirement 80 Fuel handling and storage system** 6.68. For reactors using a water pool system for fuel storage, the design of the plant shall include the following: a) Means for controlling the temperature, water chemistry and activity of any water in which irradiated fuel is handled or stored; b) Means for monitoring and controlling the water level in the fuel storage pool and means for detecting	**Requirement 80 Fuel handling and storage system** 6.68 With the goal to practically eliminate significant releases, for reactor using a water pool system for fuel storage, the design shall : a) provide the necessary spent fuel pool cooling capabilities to prevent the uncovering of the fuel assemblies in operational states and accident conditions relevant for the spent fuel pool, b) provide features to prevent the uncovering of the fuel assemblies in the event of a leak or pipe break

LL	Current text	Proposal for Member States consultation
	leakage; c) Means for preventing the uncovering of fuel assemblies in the pool in the event of a pipe break (i.e. anti-siphon measures).	c) provide capabilities to restore the water inventory d) include the following: 1) Means for monitoring and controlling the water temperature in operational states and accident conditions relevant for the spent fuel pool; 2) Means for monitoring the water level in operational states and accident conditions relevant for the spent fuel pool; 3) Means for monitoring the activity in water and air in operational states and accident condition relevant for the spent fuel pool ; 4) Means for monitoring water chemistry in operational states; 5) Means to enable the use of non-permanent equipment to ensure the long term spent fuel pool cooling. The non-permanent equipment may be available at the site or not.

Addendum to SSR-2/2

Lessons Learned	Current Text	Proposal for Member States consultation
(Editorial)	Requirement 3.2(c): Operating functions, which include executive decision making and actions for the operation of a plant for all operational states and accidents conditions.	Requirement 3.2(c): Operating functions, which include executive decision making and actions for the operation of a plant for all operational states and accident~~s~~ conditions.
43.1/ 43.2	Requirement 4.44: Safety reviews shall be carried out at regular intervals. Safety reviews shall address, in an appropriate manner, the consequences of the cumulative effects of plant ageing and plant modification, equipment requalification, operating experience, current standards, technical developments, and organizational and management issues, as well as siting aspects. Safety reviews shall be aimed at ensuring a high level of safety throughout the operating lifetime of the plant.	Requirement 4.44: Safety reviews shall be carried out at regular intervals. Safety reviews shall address, in an appropriate manner, the consequences of the cumulative effects of plant ageing and plant modification, equipment requalification, operating experience, current standards, technical developments, and organizational and management issues, as well as ~~siting~~ site related aspects. Safety reviews shall be aimed at ensuring a high level of safety throughout the operating lifetime of the plant.
46.15	Requirement 4.47: On the basis of the results of the systematic safety assessment, the operating organization shall implement any necessary corrective actions and reasonably practicable modifications for compliance with applicable standards aiming at enhancing the safety of the plant.	Requirement 4.47: On the basis of the results of the systematic safety assessment, the operating organization shall implement any necessary corrective actions and reasonably practicable modifications for compliance with applicable standards aiming at enhancing the safety of the plant~~.~~ and further reducing the likelihood and consequences of severe accidents.
44.1	Requirement 5.7: Facilities, instruments, tools, equipment, documentation and communication systems to be used in an emergency shall be kept available and shall be maintained in good operational condition in such a manner that they are unlikely to be affected by, or made unavailable by, accident conditions.	Requirement 5.7: Facilities, instruments, tools, equipment, documentation and communication systems to be used in an emergency, including those for the accident management programme, shall be kept available and shall be maintained in good operational condition in such a manner that they are unlikely to be affected by, or made unavailable by, accident conditions. The operating organization shall ensure that relevant safety parameter information is available in the emergency centre and technical support centre and communication is effective between the control rooms and these centres in accident conditions.

		These capabilities shall be tested periodically.
(consistency with DEC in SSR-2/1)	Requirement 19: **The operating organization shall establish an accident management programme for the management of beyond design basis accidents.**	Requirement 19: **The operating organization shall establish an accident management programme for the management of ~~beyond design basis accidents~~design extension conditions[1].** New footnote 1: 'Design extension conditions' has replaced the term 'beyond design basis accidents' used previously in SSR-2/2. The definition of 'design extension conditions' is as given in SSR-2/1.
46.1/ 21.2/ 46.17/ 46.2	Requirement 5.8: An accident management programme shall be established that covers the preparatory measures and guidelines that are necessary for dealing with beyond design basis accidents. The accident management programme shall be documented and periodically reviewed and revised as necessary. It shall include instructions for utilization of the available equipment — safety related equipment as far as possible, but also conventional equipment — and the technical and administrative measures to mitigate the consequences of an accident. The accident management programme shall also include organizational arrangements for accident management, communication networks and training necessary for the implementation of the programme.	Requirement 5.8: 5.8 An accident management programme shall be established that covers the preparatory measures and guidelines that are necessary for dealing with ~~beyond design basis accidents~~design extension conditions, including for spent fuel storage. The accident management programme shall be documented and periodically reviewed and revised as necessary. 5.8a For a site where several units are co-located, the accident management programme shall consider concurrent severe accidents on multiple units due to, for example, external hazards. Resource in terms of trained and experienced personnel, equipment, supplies and external support shall be available to cope with the above. 5.8b It shall include instructions for utilization of the available equipment — safety related equipment as far as possible, but also conventional equipment. 5.8c It shall include contingency measures such as alternative supply of water, compressed air or other gasses and mobile electrical power sources to mitigate severe accidents, including any necessary equipment. This equipment shall be located and maintained so that it can withstand and will be readily accessible in postulated emergency conditions. 5.8d It shall include the technical and administrative measures to mitigate the consequences of an accident, organizational arrangements for accident management, communication networks.

		5.8e It shall include training necessary for the implementation of the programme. 5.8f When developing the accident management programme and associated procedures, accessibility, adverse working conditions (e.g. elevated radiation levels, elevated temperatures, lack of lighting, access to plant from off-site) for operating staff, as well as degraded operating conditions for equipment shall be taken into account to ensure expected accident management actions will be feasible and reliable.
21.2	Requirement 5.9: Arrangements for accident management shall provide the operating staff with appropriate systems and technical support in relation to beyond design basis accidents. These arrangements and guidance shall be available before the commencement of fuel loading and they shall address the actions necessary following beyond design basis accidents, including severe accidents. In addition, arrangements shall be made, as part of the emergency plan, to expand the emergency response arrangements, where necessary, to include the responsibility for long term actions.	Requirement 5.9: Arrangements for accident management shall provide the operating staff with appropriate systems and technical support in relation to ~~beyond design basis accidents~~design extension conditions. These arrangements and guidance shall be available before the commencement of fuel loading, be validated and then periodically tested in exercises to ensure that they support~~, and they shall address~~ the actions necessary following ~~beyond design basis accidents~~design extension conditions, including severe accidents. In addition, arrangements shall be made, as part of the emergency plan, to expand the emergency response arrangements, where necessary, to include the responsibility for long term actions.
(Proposal from Finland)	Requirement 5.24: The operating organization shall be responsible for ensuring that appropriate procedures are in place for effectively coordinating and cooperating with all firefighting services involved. Periodic joint fire drills and exercises shall be conducted to assess the effectiveness of the fire response capability.	Requirement 5.24: The operating organization shall be responsible for ensuring that appropriate procedures and competent staffing are in place for effectively coordinating and cooperating with all firefighting services involved. Periodic joint fire drills and exercises shall be conducted to assess the effectiveness of the fire response capability.
45.1	Requirement 5.27: The operating organization shall establish and implement a programme to report, collect, screen, analyse, trend, document and communicate operating experience at the plant in a systematic way. It shall obtain and evaluate information on relevant operating experience at other nuclear installations to	Requirement 5.27: The operating organization shall establish and implement a programme to report, collect, screen, analyse, trend, document and communicate operating experience at the plant in a systematic way. It shall seek to obtain and evaluate information on relevant operating experience at other nuclear installations to ~~draw~~ incorporate lessons

	draw lessons for its own operations. It shall also encourage the exchange of experience within national and international systems for the feedback of operating experience. Relevant lessons from other industries shall also be taken into consideration, as necessary.	for its own operations including emergency related arrangements. It shall also encourage the exchange of experience within national and international systems for the feedback of operating experience. Relevant lessons from other industries shall also be taken into consideration, as necessary.
(consistency with DEC in SSR-2/1)	Requirement 7.3: Procedures shall be developed for use in the event of anticipated operational occurrences and design basis accidents. Emergency operating procedures and guidance for managing beyond design basis accidents shall also be developed. Both event based approaches and symptom based approaches shall be used, as appropriate. The related analysis and justifications shall be documented.	Requirement 7.3: Procedures shall be developed for use in the event of anticipated operational occurrences and design basis accidents. Emergency operating procedures and guidance for managing ~~beyond design basis accidents~~design extension conditions shall also be developed. Both event based approaches and symptom based approaches shall be used, as appropriate. The related analysis and justifications shall be documented.

Addendum to GSR Part 4

LL	Current text	Proposal for Member States consultation
50.1 50.2	**Requirement 2: Scope of the safety assessment** **A safety assessment shall be carried out for all applications of technology that give rise to radiation risks; that is, for all types of facilities and activities.** **Requirement 14: Scope of the safety analysis** **The performance of a facility or activity in all operational states and, as necessary, in the post-operational phase shall be assessed in the safety analysis.**	New paragraphs after 4.36 4.36.a For sites with multiple facilities or activities, account shall be taken in the safety assessment of the effect of external hazards on all facilities and activities, including the possibility of concurrent events in different facilities and activities, and of the potential hazards presented by each facility or activity to the others. 4.36.b A systematic assessment process shall be used to review multiple facility sites for the potential for common cause failures due to the possibility of using the same safety systems for more than one unit in accident conditions. 4.36.c If facilities share resources (whether human or material) in accident conditions the safety assessment shall demonstrate that the required safety functions can nevertheless be fulfilled at each facility during such conditions.

50.1	4.31. The external events that could arise for a facility or activity have to be addressed in the safety assessment, and it has to be determined whether an adequate level of protection against their consequences is provided. This could include natural external events, such as extreme weather conditions, and human induced events, such as aircraft crashes, depending on the possible radiation risks associated with the facility or activity. Where applicable, the magnitude of the external events that the facility is required to be able to withstand (sometimes referred to as design basis external events) has to be established for each type of external event on the basis of historical data for the site for natural external events and a survey of the site and the surrounding area for human induced events. Where there is more than one facility or activity at the same location, account has to be taken in the safety assessment of the effect of a single external event, such as an earthquake or a flood, on all of the facilities and activities, and of the potential hazards presented by each facility or activity to the others.	4.31. The external events that could arise for a facility or activity have to be addressed in the safety assessment, and it has to be determined whether an adequate level of protection against their consequences is provided. This could include natural external events, such as extreme weather conditions, and human induced events, such as aircraft crashes, depending on the possible radiation risks associated with the facility or activity. Where applicable, the magnitude of the external events that the facility is required to be able to withstand (sometimes referred to as design basis external events) has to be established for each type of external event on the basis of historical data for the site for natural external events and a survey of the site and the surrounding area for human induced events. ~~Where there is more than one facility or activity at the same location, account has to be taken in the safety assessment of the effect of a single external event, such as an earthquake or a flood, on all of the facilities and activities, and of the potential hazards presented by each facility or activity to the others~~The safety assessment shall demonstrate that the design provides sufficient margins to cope with external hazards of a severity or duration exceeding those considered in the design for ensuring that off-site protection measures limited in time and areas are sufficient to protect the public and the environment.
5.1 22.1	4.48 It has to be determined in the safety assessment whether there are adequate safety margins in the design and operation of the facility, or in the conduct of the activity in normal operation and in anticipated operational occurrences or accident conditions, such that there is a wide margin to failure of any structures, systems and	4.48 a The safety assessment shall include in-depth evaluation to identify potential cliff-edge effects in the facility response to postulated initiating events. For each cliff-edge effect identified, the safety assessment shall confirm that there are adequate margins to avoid the cliff-edge effect or a sufficient grace period is available for taking

	components for any of the anticipated operational occurrences or any possible accident conditions. Safety margins are typically specified in codes and standards as well as by the regulatory body. It has to be determined in the safety assessment whether acceptance criteria for each aspect of the safety analysis are such that an adequate safety margin is ensured.	mitigatory actions.
19.1	5.6. The results of the safety assessment have to be used to specify the procedures to be put in place for all operational activities significant to safety and for responding to anticipated operational occurrences and to accidents. The safety assessment is also to be used as an input into planning for on-site and off-site emergency response and accident management.	5.6. The results of the safety assessment have to be used to specify the procedures to be put in place for all operational activities significant to safety and for responding to anticipated operational occurrences and to accident~~s~~ conditions. The safety assessment is also to be used as an input into planning for on-site and off-site emergency response and accident management.
Additional modification for consistency	4.20 All safety functions associated with a facility or activity are to be specified and assessed. This includes the safety functions associated with the engineered structures, systems and components, any physical or natural barriers and inherent safety features as applicable, and any human actions necessary to ensure the safety of the facility or activity. This is a key aspect of assessment, and is vital to the assessment of the application of defence in depth (see paras 4.45–4.48). An assessment is undertaken to determine whether the safety functions can be fulfilled for all normal operational modes (including startup and shutdown where appropriate), all anticipated operational occurrences and	4.20 All safety functions associated with a facility or activity are to be specified and assessed. This includes the safety functions associated with the engineered structures, systems and components, any physical or natural barriers and inherent safety features as applicable, and any human actions necessary to ensure the safety of the facility or activity. This is a key aspect of assessment, and is vital to the assessment of the application of defence in depth (see paras 4.45–4.48). An assessment is undertaken to determine whether the safety functions can be fulfilled for all normal operational modes (including startup and shutdown where appropriate), all anticipated operational occurrences and the accident conditions to be taken into account* .~~; these includes design basis accidents and beyond design basis accidents (including severe accidents).~~

	the accident conditions to be taken into account; these includes design basis accidents and beyond design basis accidents (including severe accidents).	* Footnote: Safety functions are functions that are necessary to be performed for the facility or activity to prevent or mitigate radiological consequences of normal operation, anticipated operational occurrences and accident conditions. These functions can include control of reactivity, removal of heat from radioactive material, confinement of radioactive material and shielding, depending on the nature of the facility or activity.
Additional modification for consistency	4.50 The consequences arising from all normal operational conditions (including startup and shutdown, where appropriate) and the frequencies and consequences associated with all anticipated operational occurrences and accident conditions have to be addressed in the safety analysis. This includes accidents that have been taken into account in the design (referred to as design basis accidents) as well as beyond design basis accidents (including severe accidents) for facilities and activities where the radiation risks are high. The analysis has to be performed to a scope and level of detail that correspond to the magnitude of the radiation risk associated with the facility or activity, the frequency of the events included in the analysis, the complexity of the facility or activity, and the uncertainties inherent in the processes that are included in the analysis.	4.50 The consequences arising from all normal operational conditions (including startup and shutdown, where appropriate) and the frequencies and consequences associated with all anticipated operational occurrences and accident conditions (including severe accidents) have to be addressed in the safety analysis. ~~This includes accidents that have been taken into account in the design (referred to as design basis accidents) as well as beyond design basis accidents (including severe accidents) for facilities and activities where the radiation risks are high.~~ The analysis has to be performed to a scope and level of detail that correspond to the magnitude of the radiation risk associated with the facility or activity, the frequency of the events included in the analysis, the complexity of the facility or activity, and the uncertainties inherent in the processes that are included in the analysis.

Update of cross-references

GSR Part 1

Update reference [4] with SSR-6 and check the text of 2.17

Update reference [5] with GSR Part 7 (DS457) and check the text of 2.20, 2.24

Update reference [6] with GSR Part 3 and check the text of 2.25, 4.42 (a). Check also the footnote 6

Update reference [7] with GSR Part 6 (DS450) and check the text of 2.28

Update reference [8] with GSR Part 4 Rev.1 (DS462) and check the text of 4.3 (b) and (e)

Update reference [9] with GSR Part 2 (DS456) and check 4.3 (e), 4.14

NS-R-3

Update reference [1] with SF-1 and amend the text of 1.1

Update reference [2]. Remove “in preparation”

Update reference [3] with SSG-9

Update reference [4] and [5] with SSG-18

Update reference [9] with GSR part 2 (DS456), GS-G-3.1 and GS-G-3.5 and see what can be done with section 6 on quality assurance. Shall we just change the reference ?

SSR-2/1

Update reference [2] with GSR Part 4 rev.1 (DS462)

Update reference [4] with SSR-2/2 rev.1 (DS462). Should ref [4] be used in para 2.7 or rather [9]

Update reference [8] with GSR Part 2 (DS456)

Update reference [9], taking out the “interim edition” and check Requirement 5 and below

Update reference [10] with NS-R-3 Rev.1 (DS462)

Include the reference to GSR Part 7

SSR-2/2

Update reference [2] with GSR Part 2 (DS456) and update para 1.3. Check also Requirements 2 and associated requirements 3.4 to 3.7

Update reference [4] with SSR-2/1 Rev.1 (DS462)

Update reference [5] with GSR Part 7 (DS457) and check the text of 5.2, of 5.10, of 5.14

Update reference [6] with GSR Part 3

Update reference [8] with SSR-6 and check the text of 7.27

Update reference [9] with GSR Part 6 (DD450) and check section 9

GSR Part 4

Update reference [2] with GSR Part 1 Rev.1 (DS462) and update footnote 3 (title)

Update reference [3] with SSR-6

Update reference [4] with GSR Part 3

Update reference [5] with SSR-5 and update the first sentence of 4.44