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)

DS497D – NS-G-2.5: 38 comments / Accepted (fully or partially): 32 (84%) / Rejected: 6 (16%)

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
WNTI	7	7	
UK	1	1	
UKRAINE	12	12	
USA	5	4	1
ENISS	4	2	2
GERMANY	9	6	3

	COMMENTS BY REVIEWER Reviewer: **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)** (with comments of GRS) Pages: 4 Country/Organization: **Germany** Date: 9 October 2020				RESOLUTION			
Rele - vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1.	2.7 new bullets	(k) Design basis accident (l) DEC without core melt	We undertand that the current list is not exhaustive, but we are missing guidances for conditions beyond "Anticipated operational occurrences". We are the opinion that DBA and DEC without core melt should be added to the list. These should not cause severe core damage but should never result in reactivity increase or in criticality.			X	It is a non exhaustive list.
1	2.	2.9	The reactor core analysis should include an analysis of fuel element performance (based on average and local power levels, and axial temperature or void distributions) to demonstrate that the respective thermal and mechanical fuel design limits are met for normal operation~~all operational states~~, anticipated operational occurrences and design basis accidents.	We agree that some fuel design limits might not be met in some accidents without core melt. But still we are the opinion that the reactor core analysis should be done for three cases: - Normal operation - Anticipated operational occurrences - Design base accidents	X	The reactor core analysis should include an analysis of fuel element performance (based on average and local power levels, and axial temperature or void distributions) to demonstrate that the respective thermal and mechanical fuel design limits are met for normal operation, anticipated operational occurrences and		

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						design basis accidents.		
1	3.	2.17	Such modifications should be independently verified and validated, and functionally tested in accordance with standard methods and procedures for the management and control of software, which could include approval by the regulatory body before implementation.	Validation is important for quantifying safety margins.	X			
2	4.	2.21 (a)	Identification of the instruments and the calibration and assessment methods to be used by the control room operators, so that the relevant reactor parameters can be monitored within a range that is consistent with the ~~design intent~~ limits imposed by the design of the fuel and of the plant and the safety analysis;	"Design intent" is an ambiguous technical term with several different meanings. As this may cause confusion, we propose to avoid this term, even it is used in SSR 2/2. To be more in line with the objective the wording "design intent" should be replaced with the already used description in section 2.1 of this guide. In case "design intent" was just related to the instrumentation the limitations due to fuel design and plant design would have been missing.	X To be more in line with the wodingin g already used in section 2.1 of this guide.			

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Rele - vanz	Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
2	5.	2.34 (d)	For pressurized water reactors the c~~C~~oncentrations of soluble boron (or 10B content when enriched boron is used) in the coolant ~~and/~~or moderator, or both~~(for pressurized water reactors)~~.	Clarification and Wording			X	It is better to keep 'for pressurized water reactors' at the end. And 'both' is not useful because it is written 'and/or'.
1	6.	2.63 footnote	Some reactors using natural uranium show a reactivity increase as plutonium builds up in the fuel during its early use. The same applies for fuels bearing burnable absorbers as gadolinium.	Gadolinium-bearing fuel shows its maximum reactivity at a burnup of about 10 GWd/tHM (depending on Gd content etc.)	X			
2	7.	3.17	The identification number of each fuel assembly should be verified, and related documentation should be checked to confirm that the fuel received corresponds to what was ordered and conforms to design ~~intent~~ requirements.	Clarification	X			
1	8.	5.21	In order to monitor the performance of fuel elements in the core and to predict their further behaviour, a programme for inspection of the irradiated fuel should be established and implemented. This inspection may include indication of invreased fretting, clad oxidation level, crud deposition, etc.	Clarification			X	This already covered in par 2.45 "The inspection programme should include means for the detection of cladding oxidation, crud

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								deposition and fuel element bowing to identify abnormal degradations." And in 2.73(e) Fretting is not visible, except the damages induced by fretting; to observe fretting, a suspected rod has to be extracted from the assembly.
2	9.	8.2 (b)	Ensuring that from the design stage onwards the plant management will be provided with the necessary data, design reports and documents relating to manufacturing, construction, commissioning and quality management to permit safe plant operation in accordance with the design ~~assumptions and intent~~ specifications;	Clarification	**X**			

COMMENTS BY REVIEWER Reviewer: ENISS Country/Organization: ENISS			Page: 1 of 1 Date: 9 October 2020	RESOLUTION ENISS			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	2.34 (c)	Positions and patterns of control rods and discrete (burnable) ~~zonal~~ neutron absorbers	Could be confused with integral burnable absorbers which is impossible to monitor, analyse for trends etc.			X	The new proposed text does not correspond to the meaning of the initial text. zonal neutron absorber refers to neutron absorbers which are not under the form of a rod: control plates / liquid zone control units (in PHWRs).
2	2.36	(e.g. the insertion depth ~~rate~~ of the absorber devices compared with their insertion limits)	This relates to the control rods position relative to their insertion limits rather than insertion "rate" in the sense of the time change	X			
3	4.22, item (j)	~~At least one~~ An adequate number of shutdown cooling loops should be in operation with appropriate emergency cooling capability available.	It could depend on the plant design how much shutdown cooling loops is adequate for normal operation.		X An adequate number of shutdown cooling loops (at least one) should be in operation with appropriate emergency cooling capability available.		

4	8.7, last sentence	When the operating organization arranges to obtain core management services (from other groups within the operating organization or from other organizations), these services should be ~~readily accessible~~ available so that their procurement doesn't impede safe operation.	Text clarification. It is not clear, what means „readily accessible“ services.			X	Clear enough: “When the operating organization arranges to obtain core management services (from other groups within the operating organization or from other organizations), these services should be readily accessible.”

COMMENTS BY REVIEWER Reviewer: SSTC NRS Country/Organization: Ukraine			Page 1 of 6 Date: 8 October 2020	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1.	2.31	Further recommendations on reactivity control during operations of nuclear power plants are provided in ***~~DS497G~~ NS-G-2.14*** [8], and recommendations on the core reactivity characteristics and	The Draft Safety Guide DS497G is a new Revision of the Safety Guide NS-G-2.14 Conduct of Operations at Nuclear Power Plants (2008). When it will be	X Same in the Ref. [8]			

		the reactivity control features are provided in SSG-52 [10].	released, it will lose the "DS497G" number and supersede NS-G-2.14.	*But NSOC as probably its reason to do that.*			
2.	2.36	Recommendations on equipment qualification are provided in IAEA Safety Standards Series ~~***No. DS514, Qualification of Items Important to Safety in Nuclear Installations***~~ ***Equipment Qualification for Nuclear Installations*** [13].	According to IAEA "Long term structure of the IAEA safety standards and current status. October 2020", a new Safety Guide has a slightly different title. It is recommended not to use the Draft Standard number but to leave the name only.	X Same in the Ref. [13] *But NSOC as probably its reason to do that.*			
3.	2.37 2nd bullet	… —Have suitable sensitivity, *delay time*, range and calibration for all operational states and, where appropriate, for accident conditions; …	National NPP operational practice		X You mean "response time"? If yes, "Have suitable sensitivity and response time, …" will be added.		
4.	2.73	A core management and fuel handling surveillance programme should be established for the early detection of any deterioration that could result in an unsafe condition in the reactor core. Surveillance activities should include monitoring, checking, calibration, testing and inspection. These activities should be part of an overall surveillance programme to be formulated and implemented in accordance with the recommendations provided in ~~***DS497E NS-G-2.6***~~ [6]. …	The Draft Safety Guide DS497E is a new Revision of the Safety Guide NS-G-2.6 Maintenance, Surveillance and In-Service Inspection in Nuclear Power Plants (2002). When it will be released, it will lose the "DS497E" number and supersede NS-G-2.6.	X Same in the Ref. [6] *But NSOC as probably its reason to do that.*			

5.	2.74	The equipment qualification programme at the plant (see ~~***DS514***~~ [13]) should confirm the capability of the instrumentation and systems used for core monitoring, fuel handling and storage to perform their functions, for the relevant time period under given environmental conditions (e.g. conditions of pressure, temperature, radiation levels, mechanical loading and vibration), taking into account the appropriate functional and safety issues.	When this Draft Standard Guide will be released, it will lose the "DS514" number and will have a new Standard number. It is recommended not to use the Draft Standard number but to leave the name only.	X Same in the Ref. [13] *But NSOC as probably its reason to do that.*			
6.	3.3	Proper facilities for the receipt, storage and handling of a full consignment of fuel should be available on the site before any fresh fuel is delivered to the site. If fuel of a new design is to be delivered, or if the fuel enrichment has changed or re-racking of a storage area is necessary, the validity of the criticality safety analysis should be reassessed before receipt of the fuel. Recommendations on the design of such facilities, including consideration of events that could lead to inadvertent criticality excursions or could adversely affect the fuel and/or fuel handling and storage systems, are provided in IAEA ~~***Safety Standards Series No. DS487***~~ ***Specific Safety Guide No. SSG-63*** Design of Fuel Handling and Storage Systems for Nuclear Power Plants [15].	According to IAEA "Long term structure of the IAEA safety standards and current status. October 2020", a new Specific Safety Guide No. SSG-63 Design of Fuel Handling and Storage Systems for Nuclear Power Plants (ex DS487) is awaiting for publication.	X Same in the Ref. [15] *But NSOC as probably its reason to do that.*			
7.	3.24	The storage area for fresh fuel should be operated in such a manner so as to ensure that the subcriticality criteria specified in the design (see ~~***DS487 SSG-63***~~ [15]) are met. Subcriticality should be maintained at all times, even in the event of internal or external flooding or	According to IAEA "Long term structure of the IAEA safety standards and current status. October 2020", a new Specific Safety Guide No. SSG-63 Design of Fuel Handling and Storage	X Same in the Ref. [15]			

		any other event considered in the design. Physical and/or administrative measures should be taken to ensure that fuel is handled and stored only in approved locations in order to prevent a critical configuration from arising. It should be verified that the enrichment of the fuel is commensurate with the design limitations of the storage area.	Systems for Nuclear Power Plants (ex DS487) is awaiting for publication.	*But NSOC as probably its reason to do that.*			
8.	5.2	To ensure that fuel integrity and subcriticality are maintained, irradiated fuel should be handled, stored and inspected only in approved facilities and with equipment that has been qualified for this purpose (see ~~***DS487***~~ ***SSG-63*** [15] and ~~***DS514***~~ [13]). All handling, movement and storage of irradiated fuel and core components is required to be undertaken in accordance with written procedures: see paras 7.26 and 7.28 of SSR-2/2 (Rev. 1) [1].	When this Draft Standard Guide will be released, it will lose the "DS514" number and will have a new Standard number. It is recommended not to use the Draft Standard number but to leave the name only. According to IAEA "Long term structure of the IAEA safety standards and current status. October 2020" a new Specific Safety Guide No. SSG-63 Design of Fuel Handling and Storage Systems for Nuclear Power Plants (ex DS487) is awaiting for publication.	X Same in the Ref. [13, 15] *But NSOC as probably its reason to do that.*			
9.	6.8	Where appropriate, programmes should be established for the surveillance and maintenance of core components during service. Checks should be made for physical changes such as bowing, swelling, corrosion, wear and creep. These programmes should include examination of unloaded components, including components to be returned to the core for further service, in order to detect significant degradation during service. Maintenance programmes	The Draft Safety Guide DS497E is a new Revision of the Safety Guide NS-G-2.6 Maintenance, Surveillance and In-Service Inspection in Nuclear Power Plants (2002). When it will be released, it will lose the "DS497E" number and supersede NS-G-2.6.	X Same in the Ref. [6] *But NSOC as probably its reason to do that.*			

		should include procedures to prevent the introduction of foreign materials into the reactor: see paras 2.75–2.77. Further recommendations on the surveillance and maintenance of items important to safety are provided in ~~***DS497E***~~ ***NS-G-2.6*** [6].					
10.	8.3	(e) Actions to be taken by operating personnel whenever core parameters are outside the limits and conditions for normal operation, and corrective actions to be taken to prevent safety limits from being exceeded (see ~~***DS497A***~~ ***NS-G-2.2*** [3]); (f) Independent review of the performance of the core and of proposals for significant modifications to plant items and procedures (see ~~***DS497B***~~ ***NS-G-2.3*** [4]);	The Draft Safety Guide DS497A is a new Revision of the Safety Guide NS-G-2.2 Operational Limits and Conditions and Operating Procedures for Nuclear Power Plants (2000). When it will be released, it will lose the "DS497A" number and supersede NS-G-2.2. The Draft Safety Guide DS497B is a new Revision of the Safety Guide NS-G-2.3 Modifications to Nuclear Power Plants (2001). When it will be released, it will lose the "DS497B" number and supersede NS-G-2.3.	X Same in the Ref. [3, 4] *But NSOC as probably its reason to do that.*			
11.	8.7	Internal interfaces and interfaces with external organizations should be specified and documented by the operating organization: see Section 4 of ~~***DS497C***~~ ***NS-G-2.4*** [5]. The documentation should specify what information needs to be exchanged between organizations, and by whom, and the reviews and approvals that are necessary. When the operating organization arranges to obtain core management services (from other groups within the operating organization	The Draft Safety Guide DS497C is a new Revision of the Safety Guide NS-G-2.4 The Operating Organization for Nuclear Power Plants (2001). When it will be released, it will lose the "DS497C" number and supersede NS-G-2.4.	X Same in the Ref. [5] *But NSOC as probably its reason to do that.*			

		or from other organizations), these services should be readily accessible.					
12.	9.1	Requirement 15 of SSR-2/2 (Rev. 1) [1] states that "~~***[t]***~~ ***T***he operating organization shall establish and maintain a system for the control of records and reports." For the safe operation of a nuclear power plant, the operating organization should have adequate information on the fuel, core parameters and core components, and on the handling equipment for the fuel and for core components. This information should include details of the design and installation and the results of safety analyses.	Editorial correction	X			

COMMENTS BY REVIEWERS					RESOLUTION			
Reviewer: U.S. Nuclear Regulatory Commission								
Country/Organization: U.S. Nuclear Regulatory Commission			Date: 14 October 2020					
Comment No.	Draft Safety Guide No.	Para/ Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	DS497D	~~2.3(f)~~ 2.4(f)	… any fuel assembly to operate in exceedance of analyzed ranges. Where is this sentence?	"exceed its limiting conditions" sounds like violating technical specifications (TS). Proper course would instead be obtaining TS change before violating. If exceeding analyzed operating			X	1. Comment not clear. 2. Para not correct and. 3. What is written in 2.4(f) corresponds to

			Providing safety justification before allowing any fuel assembly to exceed its limiting conditions;	parameter not in TS, then in general a safety justification may be sufficient.				the proposed new text and the rationale of the reviewer.
2	DS497D	2.28(b)	[Delete or possibly combine by including control rods and soluble absorbers as examples in part (c)]	(b) is wholly redundant to (c) and (d), except only a specific case, since there are other means as well, such as recirculation flow, coolant temperatures, etc.		X Agree to delete (d)		
3	DS497D	2.61	… the operating organization when changing to a new supplier to ensure adequate quality of the fuel assembly and supporting analysis is maintained."	Prefer direct, positive phrasing of requirement. Also suggest adding supporting safety analysis methods, which are frequently vendor-dependent.		X Clear enough, but I add (see in red): Care should be taken by the operating organization if considering changing to a new supplier, to ensure that the quality of the fuel assembly is not adversely affected and supporting analysis is maintained (if applicable).		
4	DS497D	2.75-2.77	Move section to Section 4.0 of document	FME subsection naturally belongs under implementation of refueling program, not core management. Core management section can reference these positions, just as do the irradiated fuel and core components sections do.	X			

5	DS497D	2.20	(r) Acceptable power ramp rates; (u) Foreign material intrusion.	Additional items to be considered for safe operation of a reactor.	X			

COMMENTS BY REVIEWER Reviewer: P. Malesys, S. Edwards Country/Organization: WNTI			Page 1 of 3 Date: 9 October 2020	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	1.2 Footnote 2	[2] In this publication, 'fuel handling' refers to the receipt of fresh fuel, movement, storage and control of fresh and irradiated fuel, as well as handling of fuel ~~casks~~ **packages** in the spent fuel pool.	"Package" is the word that is used in the IAEA Regulations for the Safe Transport of Radioactive Material (SSR-6 (Rev. 1).	X			
2	3.19	3.19. Transport ~~casks and~~ packages should be checked to verify that they are properly identified and free from damage. Storage arrangements and identification should be such as to eliminate unnecessary handling.	Clarification. It is not sure that there is a difference between "cask" and "package" in this sentence. And "package" is the word that is used in the IAEA Regulations for the Safe Transport of Radioactive Material (SSR-6 (Rev. 1).	X			

3	6.5	(…). (g) Means of transferring irradiated components into a suitable ~~cask or~~ transport package should be provided, where necessary.	Clarification. It is not sure that there is a difference between "cask" and "transport package" in this sentence. And "package" is the word that is used in the IAEA Regulations for the Safe Transport of Radioactive Material (SSR-6 (Rev. 1).	X			
4	7.2	7.2. The fuel for loading into a transport ~~cask or package, or~~ package that has been approved for use for such fuel (particularly in terms of criticality assessment), should be selected on the basis of its burnup, irradiation history and cooling time, in order that the radiation levels and decay heat levels remain within the specified limits for the ~~cask or~~ package. If special removable neutron absorber curtains or similar devices are necessary, procedures should be established to ensure that these are in place before fuel is placed in the ~~cask or~~ package. The ~~cask or~~ package is required to be labelled in accordance with the applicable transport regulations (see para. 7.27 of SSR-2-2 (Rev. 1) [1]) and should be clearly marked with any other necessary means of identification.	Clarification. It is not sure that there is a difference between "cask" and "package" in this paragraph. And "package" is the word that is used in the IAEA Regulations for the Safe Transport of Radioactive Material (SSR-6 (Rev. 1).	X			

5	7.3	7.3. Procedures should be established and implemented for the preparation of the transport ~~cask or~~ package for transport off the site. These procedures should be followed to ensure, in particular, that the transport ~~cask or~~ package is leaktight and has adequate cooling capability, and that the radiation levels and contamination levels comply with the applicable transport regulations. In addition, procedures should be followed to ensure that the equipment necessary for handling the transport ~~cask or~~ package is available and has been functionally tested. The procedures should include measures such as the use of checklists with approvals and countersignatures for important hold points, to ensure that the contents of the transport ~~cask or~~ package have been correctly loaded.	Clarification. It is not sure that there is a difference between "cask" and "package" in this paragraph. And "package" is the word that is used in the IAEA Regulations for the Safe Transport of Radioactive Material (SSR-6 (Rev. 1).	X			
6	7.5	7.5. Any ~~cask or~~ package that has previously been used should initially be assumed to contain radioactive substances; the external contamination levels and radiation levels should be checked upon arrival at the site. (…).	Clarification. It is not sure that there is a difference between "cask" and "package" in this sentence. And "package" is the word that is used in the IAEA Regulations for the Safe Transport of Radioactive Material (SSR-6 (Rev. 1).	X			

7	7.6	7.6. Before a previously used (and supposedly empty) ~~cask or~~ package is opened, it should be ensured that radiation monitors with alarms are in operation, and suitable measures should be taken (such as opening the ~~casks or~~ packages under water) to prevent accidental exposure of personnel if significant quantities of radioactive material have remained in the ~~cask or~~ package.	Clarification. It is not sure that there is a difference between "cask" and "package" in this paragraph. And "package" is the word that is used in the IAEA Regulations for the Safe Transport of Radioactive Material (SSR-6 (Rev. 1).	X			

COMMENTS BY REVIEWER Reviewer: Country/Organization: UK/ONR			Page.1... of.1... Date: 8 October 2020	RESOLUTION			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection
1	2.11	The results of such predictions should be compared with measured parameters as far as practicable, and should be used to confirm that there is sufficient capability for control at all times to ensure that the reactor can be shut down safely and remain shut down following any normal condition or **anticipated operational occurrence**, with predefined failures taken into account. Alternatively:	The comment (13) made by Germany that fault condition is not defined in the IAEA glossary is well made. The suggested text was "abnormal or severely abnormal", maybe reflecting that Germany thought there could be different classes of conditions. The IAEA has just said "any normal or abnormal condition" in the revised text. The 2018 IAEA glossary for abnormal condition says "see plant states: anticipated operational occurrence" The entry for plant states (and associated diagram) has under operational states "Normal Operation" and "AOOs".		X The results of such predictions should be compared with measured parameters as far as practicable, and should be used to confirm that there is sufficient capability for control at all times to ensure that the reactor can be shut down safely and remain shut down following any normal operation, anticipated operational occurrence or design basis accident, with		

		"…..following any normal condition, **anticipated operational occurrence or design basis accident,** with predefined failures taken into account."	If the intention is to restrict para 2.11 to operational states rather than accident conditions, use AOO rather than abnormal condition for clarity. If the expectations for 2.11 apply to DBAs as well, then say so.		predefined failures taken into account.		