# Section 9 and Annex
# DS491 Draft Safety Guide: Deterministic SA for NPPs - Step 7d

| COMMENTS BY REVIEWER<br>Reviewer: Page:<br>Country/Organization: Date: | | | | RESOLUTION | | | |
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| Comment No. | Para/Line No. | Proposed new text | Reason | Accepted | Accepted, but modified as follows | Rejected | Reason for modification/rejection |
| Observer ENISS-72 | 9.1 line 1 | Ask for clarification | It should be explained that the word "verification" is used here for "surveillance" of work performed by other entities. It is not used for Verification as performed in V&V. | | | X | *The clarification seems not necessary; see GSR Part 4 Req. 21* |
| KOR-7 | §9.2<br>Line 3 | "…to reconfirm that the safety analysis developed by other entities such as designers, manufacturers and constructors has been carried out in an acceptable way and satisfies the applicable safety requirements. | Rewrite the sentence based on the para 4.67 in GSR Part 4) | X | *Consistency with GSR Part 4, para 4.67* | | |
| CAN 35 | 9.14<br>Line 2 | 9.14. All numerical models used in safety analysis should show their reliability through comparisons, independent analyses and qualification, with the aim of ~~guaranteeing~~ demonstrating that their intrinsic uncertainty level complies with the reliability required for the whole design project. | "Guaranteeing" is OK for DBA, but too strong for DEC analysis. Suggest "demonstrating". | X | Clarification | | |
| CAN 66 | 9.15 | Suggest the following additional bullets, | The components of independent verification should include selection of | X | "…<br>• Selection of acceptance | | |

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| | | *Selection of safety analysis method*<br><br>*Selection of safety analysis computer codes and adequacy of code validation* | safety analysis method and computer codes & adequacy of validation | | criteria<br>• Selection of safety analysis method<br>• Selection of safety analysis computer codes and adequacy of code validation<br>• Selection of assumptions for ensuring safety margins<br>• … | | |
| Observer ENISS-73 | 9.15 | After "in accordance … independent calculations", please add:<br>"*The independent verification should be fit to purpose and, depending of the safety analysis, should determine which of the three following verification levels is the most adequate:*<br>*Level 1: compliance with the specifications of the study* (introduce here the bullet points of the paragraph)<br>*Level 2: level 1 + critical analysis of the assumptions of the study and verification of the orders of magnitude of the results*<br>*Level 3: level 2 + independent calculations"* | An independent review is seen beneficial, but an independent calculation of certain values might be useful and proportionate only in certain cases. Section 9 as a whole does not explain it sufficiently. See GSR part 4 (Rev. 1) §4.69 which says: "specific review MAY contain comparison … with independent calculations". The proposed new text says how the licensee can take it into account | | | X | Outside the scope of this Safety Guide (too detailed) |
| Observer ENISS-74 | 9.16 | | Clarify the meaning of "if code models were developed independently" | X | 9.16. An independent check of selected computer … can meet the objectives | | |

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| | | | | | of the review if plant ~~code~~ models (including nodalization, initial and boundary conditions) were developed independently | | |
| Observer WNA 9 | 9.17 | 9.17. If independent calculations are performed, it may be appropriate | Performing independent calculations is not a requirement, it should not be considered as systematic | X | "9.17. ~~Regarding selection of cases for~~ If independent calculations are performed, it may be appropriate to select …." | | |
| **ANNEX** | | | | | | | |
| Observer EC JRC-86 | Annex A.1 (addition) | (j) Design specifications, e.g. sizing, capacity, setpoints, environmental bounding conditions for equipment qualification, etc., for existing and new, backfitted mitigating systems. | This application concerning severe-accident simulation codes is crucial. As it is related with backfitting, it does not fall under A.1(a) category. Para A.2 should be updated correspondingly. | | | X | *Part of A1 (a) [and (e)]* |
| USA 10 | A.2 (p. 56) | Deterministic safety analysis associated with the design and authorization (licensing) of a nuclear power plant (items (a) to (e)) may be performed to demonstrate compliance with established acceptance criteria with adequate safety margins (ensured in different ways for DBAs and design extension conditions). | Added missing parenthesis. | X | Editorial | | |
| CAN 36 | A.2. last sentence | Deterministic safety analysis associated with analysis of operational events, development of procedures or | Suggest changing "possible" to "practicable". | X | Clarification | | |

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| | | guidelines and support of the PSA (items (f) to (i)) are typically not aimed at demonstration of compliance with acceptance criteria and are performed in a realistic way to the extent ~~possible~~ practicable. | | | | | |
| CAN 37 | A.5<br>Line 2<br><br>And<br><br>Last line | A.5. The designer typically uses the safety analysis as an integral part of the design process, which ~~typically~~ normally consists of several iterations which may continue through the manufacture and construction of the plant. The safety analysis used in the design is performed according to a quality assurance (QA) programme ~~which includes independent reviews of all design documents~~. | Suggest changing "second occurrence of "typically" to avoid repetition.<br>The final clause does not seem to relate to DSA. However, if it is retained, change to "key design documents". I suspect that an independent review of all design documents is not done. | X | *Second change is accepted*<br>(Editorial / Clarification) | X | *First change: Typically is used in the SG* |
| CAN 38 | A.17 | Format the list of objectives as a numbered list. | Format the list of objectives as a numbered list. | X | Editorial<br>*(Bulleting (a) … (i) will be included. They were lost in formatting)* | | |
| CAN 39 | A.20<br><br>First sentence, Line 4 | A.20. Best estimate deterministic safety analyses are typically performed to confirm the recovery strategies that have been developed to restore normal operational conditions at the plant following transients due to anticipated operational occurrences and DBAs and design extension conditions without ~~core melt~~ significant fuel degradation. […] | Change "DEC without core melt" to "DEC without significant fuel degradation". | X | Editorial | | |
| CAN 40 | A.25<br>Line 4<br>and<br>Line 10 | Delete "light". Two occurrences. | Para A.25 would apply to heavy water cooled reactors too. Suggest | X | Editorial<br>*(Used*: ~~light~~ water cooled reactors") | | |

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| | | | deletion of "light". | | | | |
| CAN 41 | A.29<br>Line 3 | A.29. More specifically, the deterministic analysis is performed to specify the order of actions for both automatic systems as well as operator actions. This determines the time available for operator actions in specific scenarios, and ~~to specify the~~ supports the specification of success criteria for required systems for prevention and mitigation measures. | Suggest "and supports specification of the success criteria" | X | Clarification<br><br>*Additionally, the following sentence will be added at the end of A.27:*<br><br>"…However, it is acknowledged that some residual risks will remain." | | |