

DS507 - Seismic Hazards in Site Evaluation for Nuclear Installations

| COMMENTS BY REVIEWER | | | | RESOLUTION | | | |
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| Reviewer: B. De Boeck / P. De Gelder / Tchien Minh Tang | | Page 1of 2 | | | | | |
| Country/Organization: Belgium / Bel V | | Date: 16/05/2017 | | | | | |
| Comment No. | Para/Line No. | Proposed new text | Reason | Accepted | Accepted, but modified as follows | Rejected | Reason for modification/rejection |
| 1 | § 2 | To add in the last paragraph: “Additionally, in response to the 2011 Fukushima nuclear accident and in the framework of the risk and safety assessments (ENSREG EU Stress Tests), the assessment of the seismic hazard and design basis and the evaluation of the seismic margins was performed on all EU nuclear power plants.” | To add a paragraph summarizing the work performed in Europe (by the European Nuclear Safety Regulators Group Working Group (ENSREG)), besides the work already mentioned in USA and Japan. | | | | This paragraph is relevant to fault displacement hazard but not to the vibratory ground motion |
| 2 | § 4 | To add to the third bullet of this paragraph the following aspects: <ul style="list-style-type: none"> - Provide detailed guidance on sensitivity analysis on parameters - Provide acceptance criteria and acceptance tests for the selection of the hazard engines used for the calculations - Provide criteria for the definition of a seismogenic structure | For further specification of the objectives of the revision | | <ul style="list-style-type: none"> - Sensitivity analysis will be discussed in the paragraph of uncertainties - The testing was explicitly specified at the end of third bullet. - Specified seismogenic structure in the first bullet | | |

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| 3 | § 7 | <p>This §7 explains that the table of content of the revised SSG-9 will be kept similar to the present version. However, there is a difference with the actual table of content of the SSG-9 where there are two different chapters for the hazard analysis: chapter 6 for probabilistic and chapter 7 for deterministic hazard analysis. We consider that it is more appropriate to keep the two approaches separately.</p> | <p>For keeping the two approaches separate in different chapters.</p> | <p>Need to provide guidance of complementation between probabilistic and deterministic approach in a certain chapter. Two schemes were assigned as subchapters: <u>6.1 Probabilistic Seismic Hazard Analysis</u> <u>6.2 Deterministic Seismic Hazard Analysis</u></p> | | |
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| 4 | For first draft | <p>In view of the first draft, we would like to indicate already a few points that might be of interest to be considered:</p> <ul style="list-style-type: none"> - As it is asked to use both deterministic and probabilistic approaches (without preference for one of the other), how to manage the differences in the results? - As it is known that uncertainties in seismic hazard analysis are important, how conservative should the analysis be and what level of safety margin to choose? - To recommend that the study would be available to other experts for peer review - To recommend a better coordination between neighbouring countries | Anticipation on the first draft | | <i>These are expressing kind comments for the draft. We will definitively consider them.</i> | | |
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| COMMENTS BY REVIEWER | | | | RESOLUTION | | | |
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| Reviewer: Dr. Dana Havlín Nováková ¹ , Dr. František Gallovič ² | | Page 1 of 2 | | | | | |
| Country/Organization: SÚJB ¹ , Charles University (Department of Geophysics Faculty of Mathematics and Physics) ² /Czech Republic | | Date: 4. 5. 2017 | | | | | |
| Comment No. | Para/Line No. | Proposed new text | Reason | Accepted | Accepted, but modified as follows | Rejected | Reason for modification/rejection |
| 1 | Page 2/ Objective | Providing guidance and methods of seismic hazard assessment for areas with low seismicity. | The assessment of seismic hazards in the SSG-9/DS507 is mainly focused on areas with high seismic activity and measurable and localized | | | X | The guide is not focusing only high seismicity area, but also low seismicity area. |

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| | | <p>Providing guidance and developing seismic hazard assessment methods for deep underground radioactive waste disposal.</p> | <p>earthquakes. The procedures and methods for these territories should not be fully accepted for the assessment of seismic hazard of territories with low seismic activity.</p> <p>Due to the planning of deep repositories of radioactive waste in many countries, it would be appropriate to include a specific chapter on the assessment of seismic hazard in depth corresponding to the site of the underground radioactive waste repository. Seismic hazard assessment methods used for surface installations cannot be fully taken into account in the assessment of seismic hazards at the depth of the rock massif. It is necessary to focus the work of experts on the creation of a special methodology for this evaluation.</p> | | | | <p>The deep repository is not in the scope of nuclear installations.</p> |
| 2 | Page 3/ Place in the | Predisposal Management of Radioactive Waste from Nuclear | Requirements for siting and design of radioactive | X | | | |

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| | overall structure of the relevant series and interfaces with existing and/or planned publications | Fuel Cycle Facilities, SSG-41 | waste deposits are based among others, also in SSG-9 /DS507 (p. 48 of SSG-41). | | | | |
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| COMMENTS BY REVIEWER | | | | RESOLUTION | | | |
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| Country/Organization: FRANCE / ASN pages | | | Date: 19 April 2017 | | | | |
| Comment No. | Para/Line No. | Proposed new text | Reason | Accepted | Accepted, but modified as follows | Rejected | Reason for modification/rejection |
| 1. | §6 | GSR Part 2 and GSR Part 4 should also be mentioned | Management system requirements and safety assessment requirements are to be implemented. | X | | | |
| 2. | §6 | SSR-2/1 should be included | SSR-2/1 does set expectations for seismic hazard, including to address low probability events. | X | | | |
| 3. | §7 | 6. SEISMIC HAZARD ANALYSIS <u>6.1 Probabilistic Seismic Hazard Analysis</u> <u>6.2 Deterministic Seismic Hazard Analysis</u> | Consistency with current SSG-9 structure | X | | | |
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| COMMENTS BY REVIEWER | | | | RESOLUTION | | | |
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| Reviewer: Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) (with comments of GRS) Country/Organization: GERMANY | | | Pages 2 Date: 2017-05-15 | | | | |
| Comment No. | Para/Line No. | Proposed new text | Reason | Accepted | Accepted, but modified as follows | Rejected | Reason for modification/rejection |
| 1 | page 2, section 4 | <u>• Include and provide more guidance on the determination of parameters.</u> | There seems to be a consensus in the seismic | X | | | |

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| | | <p><u>suitable to describe the damaging effects of earthquakes.</u></p> | <p>engineering community that peak ground acceleration is not a good indicator for the damaging potential of earthquakes. Therefore it could be beneficial to discuss more in detail other parameters of earthquakes which might provide a better clue to the expected earthquake effects (e.g. CAV, spectral acceleration of the plateau of the response spectrum, intensity measures etc.) and suitable approaches for their determination in the framework of the seismic hazard assessment.</p> | | | | |
| | page 5 | <p>Staff: 20 ?? staff weeks Consultants: 10 ?? consultant weeks</p> | <p>For the revision of NS-G-2.1 (DS503) which involves a significant extension of the scope of the Safety Standard the same amount of staff (20) and consultant (10) weeks has been proposed. Given the fact that in comparison to this effort the necessary changes to SSG-9 are limited, there is an imbalance between the two resource estimates that should be resolved by either reducing the resources for this revision or by increasing them for DS503 according to the experience with similar projects.</p> | | | | <p>After the 2011 Great Tohoku Japan Earthquake, significant revise is necessary. Moreover, SSG-9 is twice size of NS-G-2.1</p> |

