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|---------------------|-----------------|---|--|----------|--|----------|---|
| NUSSC<br>Egypt 01   | 0.0.<br>General | - Some reference citation numbers need to be corrected.<br>- The reference numbering in the reference section needs to be modified considering the corrected citation numbers and the citation sequence in the document.<br>- It is proposed to write the reference number only without writing the name of the reference (e.g: <del>GSR Part 2</del> [17]).                                    |  | X        |  |          | Corrected in accordance with the IAEA's editorial rule.   |
| NUSSC<br>Korea 01   | 1.07.           | <del>Operating experience gained from incidents and accidents in nuclear power plants around the world has continued to demonstrate that fire continues to be an important risk contributor in many States. However, a number of other hazards also have to be taken into account in the design and operation of nuclear power plants.</del>  | This paragraph and the other paragraphs of Background are unbalanced in contents. Deletion is recommended. | X        | 1.6.Operating experience gained from incidents and accidents in nuclear power plants around the world has continued to demonstrate that fire continues to be an important risk contributor in many States. However, a number of other internal and external hazards also have to be taken into account in the design and operation of nuclear power plants. This Safety Guide supersedes and expands the scope of IAEA Safety Standards Series No. NS-G-2.1, Fire Safety in the Operation of Nuclear Power Plants to include recommendations on these other hazards. |          | We agree that this paragraph is unbalanced in its entire texts and have amended it to make it easier to read by positioning it as a introduction to the expansion of NS-G-2.1 described in previous paragraph.  |
| NUSSC<br>Germany 01 | 1.07.           | Operating experience gained from incidents and accidents in nuclear power plants around the world has continued to demonstrate that fire continues to be an important risk contributor in many <u>Member States</u> . However, a number of other <u>internal and external</u> hazards also have to be taken into account in the design and operation of nuclear power plants.                   | Precision, clarification   | X        |  |          |   |
| NUSSC<br>Egypt 14   | 1.08.           | The purpose of this Safety Guide  | The objective of ...   | X        |  |          |   |
| NUSSC<br>Germany 02 | 1.11.           | This Safety Guide provides detailed recommendations for the internal fire hazard which is common in most nuclear power plants. As detailed application for other hazards will be site-specific, this Safety Guide also provides high-level recommendations applicable to a broad range of internal and external hazards, <u>for</u> water cooled reactor types; and different operating phases. | Editorial  | X        | 1.10.This Safety Guide provides detailed recommendations for the internal fire hazard, which is common for most nuclear power plants. As detailed application of recommendations for other hazards would be site specific, this Safety Guide also provides high-level recommendations applicable to a broad range of internal and external hazards.  |          | The part where the correction suggested was deleted.  |
| NUSSC<br>Korea 02   | 1.14.           | This <del>guide</del> <u>Safety Guide</u> does not address societal or pathological hazards (e.g. pandemic) that do not directly impact the safety of the nuclear power plant.  | Use the same expression as in other paragraphs.  | X        |  |          |   |
| NUSSC<br>Egypt 15   | 1.14.           | This guide does not address societal or pathological hazards (e.g. pandemic) that do not directly impact the safety of the nuclear power plant  | This sentence should be deleted because, it is out of the scope of the document                            |          |  | X        | This sentence is not recommendation but the explanation that we will not provide recommendation to a topic and is necessary for the IAEA Safety Guide.  |
| NUSSC<br>Germany 03 | 1.14.           | This <u>Safety G</u> uide ...   | Editorial, for the same wording all over the text  | X        |  |          |   |
| NUSSC<br>Libya 13   | 10.01.          | [...]Recommendations on <u>the</u> training of personnel are provided in IAEA Safety Standards Series[...]  | Improved grammar.  | X        |  |          |   |
| NUSSC<br>India 07   | 10.05.          | -Preparation of detailed feedback report after the event to update the training programme and to learn lessons from the event<br>( Additional point)  | Additional point to incorporate feedbacks  |          |  | X        | We do not believe that the items in the comments apply to all plant personnel in terms of training. In addition, this is a general recommendation for operating experience feedback in management system, and we do not consider it necessary to include it here. |
| NUSSC<br>Korea 13   | 10.06.          | Familiarization with the physical location of SSCs <del>contributing to protection and safety</del> , preferably through a plant walkdown<br><u>Change options:</u><br><u>1: important to safety</u><br><u>2: contributing to nuclear safety and radiation protection.</u>  | Clarify unclear expression.  | X        | Familiarization with the physical location of structures, systems and components important to safety, preferably through a plant walkdown;   |          |   |
| NUSSC<br>Libya 14   | 10.07.          | [...] Information on drills and exercises including prompt decision-making, notification, communication with <u>an</u> external organization, [...]   | Improved grammar.  | X        | [...] communication with external organizations, [...]<br>II.81 [...] notify external organizations [...]  |          |   |
| NUSSC<br>Korea 14   | 10.07.          | Familiarization <del>with</del> and training for personnel responsible for initiation or authorization of relevant work activities should cover specific topics regarding prevention, ...   | Typo. (Refer to 10.8)  | X        |  |          |   |
| NUSSC<br>Korea 15   | 10.07.          | Maintenance, inspection, and controls of passive fire protection means including <del>of</del> fire barriers with their active elements ...   | Typo.  | X        |  |          |   |
| NUSSC<br>Korea 16   | 10.07.          | (such as gas detectors, blast doors, blowout panels, <u>and</u> room and area ventilation systems)  | Typo. ', and room & area ventilation systems'  | X        |  |          |   |

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| NUSSC<br>India 08        | 10.07.    | Awareness of ventilation system and fire dampers to prevent propagation of fire<br>(Additional point)   | For improving training programme.  | X        | Controls on hot work and the significance of hot work for fire safety, as well as instructions and procedures for taking appropriate additional or alternative fire prevention, protection and mitigation measures to sustain protective barriers (e.g. fire watches for fire detection, safety measures in confined spaces, <u>area ventilation systems</u> , and inspection, maintenance and repair of fire extinguishing features) |          |   |
| NUSSC<br>Germany 19      | 10.07.    | - Maintenance, inspection, and controls of passive fire protection means including <del>off</del> fire barriers....   | Editorial  | X        |   |          |   |
| NUSSC<br>Germany 20      | 10.07.    | - The hazards associated with <u>hot work</u> activities such as cutting <del>and or</del> welding that could produce a potential ignition source;  | Editorial using the well-known term "hot work"   | X        |   |          |   |
| NUSSC<br>Germany 21      | 10.07.    | - The stipulations of the work permit system, specific situations in which a fire watch is necessary, and the risk of introducing potential ignition sources into fire areas containing <u>structures, system and</u> components identified as important to safety;   | More comprehensive requirement   | X        |   |          |   |
| NUSSC<br>Korea 17        | 10.09.    | forecasts for predictable external hazards <del>as</del> (...) that could ...   | Typo.  | X        |   |          |   |
| NUSSC<br>India 09        | 10.09.    | The proposed description is recommendation to be addressed by the safety design or by the operator's system operation, and that they apply only to specific plant designs.  | Basic liquid waste management programme.   |          |   | X        | The proposed description is recommendation to be addressed by the safety design or by the operator's system operation, and that they apply only to specific plant designs.  |
| NUSSC<br>Egypt 06        | 10.13.    | Specifically for fire hazards, paragraph 5.24. of Requirement 22 in <del>SSR-2/1 (Rev.1)</del> <del>2) SSR-2/2 (Rev. 1) [1]</del> states.....   | SSR-2/2 (Rev. 1) [1] is the relevant reference   | X        |   |          |   |
| RASSC<br>Germany 03      | 10.13.    | Drills or exercises should be performed with participating site personnel and, as appropriate, the staff of off-site firefighters (see Appendix I).   | Firefighters should be plural  | X        |   |          |   |
| NUSSC<br>Libya 01        | 2.01.     | [...]natural or <del>human- induced</del> events unconnected with the operation of a facility [...]   | It seems that <b>human induced</b> is missing a hyphen.  |          |   | X        | This part was rewritten with the text according to the IAEA Safety Glossary (2018 edition), as follows: [...] External hazards are those hazards that originate from outside the site boundary and outside the activities that are under the control of the operating organization, for which the operating organization has very little or no control, but which could have an effect on the safety of the facility or activity. [...] |
| NUSSC<br>Libya 02        | 2.01.     | [...]of an activity that could <del>have an effect on</del> affect the safety of the facility or activity. [...]  | Improved clarity.  |          |   | X        | This part of the text is direct reference from the IAEA Safety Glossary (2018 edition). Direct references basically should not be changed from original text.   |
| EPReSC<br>South Africa 1 | 2.01.     | Delete third sentence "Such events are not connected to the operation of the site or conduct of an activity on the site, but could have an adverse effect on the safety of the site or activity."   | Repetition of preceding sentence   | X        | External hazards are those hazards that originate from outside the site boundary and outside the activities that are under the control of the operating organization, for which the operating organization has very little or no control, but which could have an effect on the safety of the facility or activity.   |          |   |
| NUSSC<br>Korea 03        | 2.01.     | Internal hazards are those hazards to the safety of the nuclear power plant that originate <del>from</del> within the site boundary and ...   | Typo.  |          |   | X        | This is the direct reference from DS494 (SSG-64) and the phrase "originate from within" can be used in everywhere.  |
| NUSSC<br>Korea 04        | 2.01.     | External hazards include natural or human induced events, unconnected with the operation of a facility or the conduct of an activity <del>that could have an effect on the safety of the facility or activity. Such events are not connected to the operation of the site or conduct of an activity</del> on the site, <del>but which</del> could have an adverse effect on the safety of the site or activity. | Correct duplication.   | X        | External hazards are those hazards that originate from outside the site boundary and outside the activities that are under the control of the operating organization, for which the operating organization has very little or no control, but which could have an effect on the safety of the facility or activity.   |          |   |
| NUSSC<br>Germany 04      | 2.01.     | ... Examples of internal and external hazards are provided in paras 5.16 and 5.17 of SSR-2/1 (Rev. 1) [2] <del>and for combinations of hazards in SSG-64 [4], Appendix 1.</del>   | Please add reference on SSG-64 for combinations of hazards   | X        |   |          |   |
| NUSSC<br>France 01       | 2.01.     | .....<br>External hazards include natural or human induced events <del>unconnected with the operation of a facility or the conduct of an activity</del> originate from outside the site area that could have an effect on the safety of the facility or activity.<br>.....  | The notion of "connected with" may be fuzzy and there could be external events outside the site area connected with the operation of a facility to be included in external events. The link with the site area is more clear and site area is defined in IAEA glossary | X        | External hazards are those hazards that originate from outside the site boundary and outside the activities that are under the control of the operating organization, for which the operating organization has very little or no control, but which could have an effect on the safety of the facility or activity.   |          |   |

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| NUSSC Egypt 16 | 2.02.            | The term 'hazard management' is used to refer to a set of operational processes and measures for prevention, protection and mitigation of hazards, and strategies for coping with the impact of these hazards to ensure safe operation of nuclear power plants.   | Safe operation and safe shutdown...   |          |  | X        | In the IAEA Safety Glossary and in this guide, 'operation' includes maintenance, refuelling, in-service inspection and other associated activities. This 'safe operation' in this sentence also aims to apply for all of these activities. Therefore, we will keep it without 'shutdown'.   |
| NUSSC Korea 05 | 2.05.            | <del>2.5.</del> The integrated management system should incorporate hazard management. ...  | Typo. It should be moved to para. 2.4.  | X        |  |          |   |
| NUSSC India 01 | 2.06 (nex para)  | Requirement 5 of SSR -2/2 on Staffing of the operating organization, states "The operating organization shall be staffed with competent managers and sufficient qualified personnel for the safe operation of the plant." The organization, qualifications and number of operating personnel shall be adequate for the safe and effective management of hazards   | Qualified staff is required to manage hazards.  |          |  | X        | This section is limited to requirements that should be mentioned.   |
| NUSSC Libya 03 | 2.09.            | Hazard management and <u>Decision- making</u> in hazard management [...]  | It seems that <b>decision making</b> is missing a hyphen.   | X        | Page.3 Contents of Section 3 and Page 18 title of sub-section: <u>DECISION_ MAKING FOR HAZARD MANAGEMENT</u><br><br>3.25 the first bullet<br>10.7 For seismic events, third bullet<br>[...] <u>decision_ making</u>  |          | As you pointed out, there were two different notational fluctuations: with and without hyphenation. I have checked again. In the IAEA publications (e.g. SSR-2/2 (rev.1) and new draft of DS497 series, etc.) and the IAEA Safety Glossary (2018 edition), the word used without a hyphen. To keep a consistency with these documents, we would like to replace decision-making without hyphenation.  |
| NUSSC Egypt 17 | 2.09.            | this Safety Guide covers all the other means that assist the operating organization in coping with hazards with minimal consequences  | With their (its) consequences   | X        |  |          | The text gives no recommendations so it was deleted to avoid misleading.  |
| NUSSC Egypt 02 | 2.11.            | The non-radiation-related safety programme <del>[footnote omitted]</del> shall include arrangements for the planning,....   | The unnecessary words should be deleted   | X        | Paragraph 5.26 of SSR-2/2 (Rev. 1) [1] further states <del>[footnote omitted]</del> : "The non-radiation-related [...]"  |          | Corrected in accordance with the IAEA's editorial rule.   |
| NUSSC India 02 | 2.12. (new para) | Requirement 24 of SSR 2/2 on Feedback of operating experience states "The operating organization shall establish an operating experience programme to learn from events at the plant and events in the nuclear industry and other industries worldwide." The operating organization shall establish and implement a programme to report, collect, screen, analyse, trend, document and communicate operating experience related to internal and external hazards at the plant in a systematic way. It shall obtain and evaluate available information on relevant operating experience on hazards at other nuclear installations to draw and incorporate lessons for its own operations, including its emergency arrangements. It shall also encourage the exchange of experience within national and international systems for the feedback of operating experience on hazards. Relevant lessons from other industries shall also be taken into consideration, as necessary. | Feedback on Operating experience on hazards and information sharing among NPP and other industries will be important for effective hazard management.   |          |  | X        | This section is limited to requirements that should be mentioned.   |
| NUSSC Japan 1  | 2.14.            | The operating organization should identify- <del>internal</del> hazards that might arise during maintenance, testing, surveillance and inspection activities. These hazards should be taken into account when developing hazard management. Hazard management issues should be considered when developing programmes for maintenance, testing, surveillance and inspection. Operational provisions or hazard management should be consistent with the recommendations provided in IAEA Safety Standards Series No. DS497E, Maintenance, Surveillance and In-Service Inspection in Nuclear Power Plants [19] <sup>6</sup>  | To keep a consistency with DS497E "Maintenance, Testing, Surveillance and Inspection in NPPs". It states that these hazard should include both internal and external hazards.   | X        | The operating organization should identify <b>internal</b> hazards that might arise during maintenance, testing, surveillance and inspection activities. These <b>internal</b> hazards should be taken into account when developing hazard management. Hazard management <b>for both internal and external hazards, issues</b> should be considered when developing programmes for maintenance, testing, surveillance and inspection. Operational provisions or hazard management should be consistent with the recommendations provided in IAEA Safety Standards Series No. DS497E, Maintenance, Surveillance and In-Service Inspection in Nuclear Power Plants [19] <sup>6</sup> . |          | As commented, DS497E recommends protection against both internal and external hazards in the MTSI activities. On the other hand, the intent of the first and second sentence in the DS503 draft was to consider that MTSI activities can themselves be a cause of hazards. A hazard which is arisen by MTSI activities is an internal hazard. However, the third sentence could also be read as recommending that only internal hazards should be considered, and could give misunderstandings, so we would like to clarify by reiterating that the overall management of MTSI should consider both internal and external hazards here. (This will be the case of "specifically noted" noted in 2.1.) |
| NUSSC India 03 | 2.16. (new para) | Requirement 16 of SSR 2/2 on programme for long term operation states "Where applicable, the operating organization shall establish and implement a comprehensive programme for ensuring the long term safe operation of the plant beyond a time-frame established in the licence conditions, design limits, safety standards and/or regulations." The operating organization should ensure that hazard management is included in the Long term operation plan, taking into account any changes in the assessed hazards.  | Hazard management should be a part of long term operation.<br><br>Chapter #2 talks about general consideration for the management of hazards. Many NPPs are nearing design life and may undertake refurbishment for long term operation i.e. extending their useful life. This may take a few years. It is felt during this process operating organization should include hazard management in their life extension plan. | X        | 2.14. Requirement 32 of SSR-2/2(Rev. 1) [1] states: [...] Hazard management should take into account the dynamic changes in plant conditions, including changes in structures, systems and components, and factors such as availability of safety systems or safety features, and increased resource needs (e.g. additional workers, combustibles, scaffoldings, vehicles) during outages and shutdown. <u>In this regard, hazard management should also take into account the refurbishment undertook for long term operation.</u>  |          | Your point has added in 2.14 as a consideration for major changes. It is also important that the consideration for the long term operation and the ageing management are not limited to such refurbishments, but that the impact of hazards and their measures are appropriately reflected in the management of ageing, and conversely, that the impact of extended operating plans on hazard management is assessed and reflected on managements. These points have been clarified in this draft revision by adding a reference to SSG-48. Nevertheless, we see no need to cite the requirements of SSR-2/2 (Rev.1).   |

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| NUSSC<br>Germany 05 | 3.01.               | The operating organization should establish a set of hazard management measures to ensure that the plant can be protected against hazards by suitable design and operational activities, including prevention and mitigation of the impact of, and coping with the consequences of hazards or credible combinations thereof, <u>according to SSG-64 [4]</u> , in an integrated management system.  | Please add reference on SSG-64 for combinations of hazards   | X        |   |          |  |
| NUSSC<br>Libya 04   | 3.05.               | The plant management is responsible for deploying protective measures <del>in a timely manner on time or promptly</del> when hazardous. [...]  | Improved clarity.  |          |   | X        | In the IAEA publications (e.g. SSR-2/2 (rev.1), GSG-11, SSG-48, SSG-50, etc.), the phrase "in a timely manner" is used to express necessary action(s) should be taken before the risk against plant operation arise. To keep a consistency with these documents, we would like to keep it. While this expression is used in other parts of this draft safety guide, we would like to keep them as well.  |
| NUSSC<br>Japan 2    | 3.06.               | The operating organization should establish and document plans and protocols for hazard management and should ensure that plant personnel are trained and qualified in these plans and protocols. The operating organization should involve a combination of personnel from the various site sections or departments in the development and application of these plans and protocols, including engineering, operations, maintenance, technical support, <del>vendor</del> and emergency response personnel, <u>with considering insights from external organizations such as vendor as appropriate</u> . The operating organization should also ensure that an adequate number of competent and qualified staff are available at all times to operate the plant safely in operational states and accident conditions in case of hazards and induced effects [18]. | "Vendor" is not a part of site section or department in operating organization and it should be stated separately as external organizations described in para 4.3 of DS497C.   | X        |   |          |  |
| NUSSC<br>India 04   | 3.06.<br>(new para) | The plant management is responsible for ensuring that the functional capabilities of non-permanent equipments/systems is ensured during hazard   | Non-permanent equipments may be required for accident management following a severe hazard.<br><br>Non-permanent equipment or system' are not defined in the present IAEA Safety Glossary. Still, it is mentioned in safety guide. There is a draft IAEA safety guide DS508 where design provision for enabling the use of non-permanent equipment for power supply and cooling was discussed in details.<br>The scope covers this as follows:<br>"Hazard prevention, protection and mitigation features in a nuclear power plant are typically safety systems and safety features, but might also include systems and features that were not originally installed or designed as safety systems or safety features."<br>That's why It is felt that this point should be clearly brought out in chapter#3. The non-permanent equipments may play a crucial role following a severe hazard in DEC . | X        | 2.8. [...] Operational provisions for hazard management should be consistent with the recommendations provided in IAEA Safety Standards Series No. SSG-54, Accident Management Programmes in Nuclear Power Plants [16]. <u>Hazard protection and mitigation features include fixed or non-permanent equipment used to restore the safety functions and to reach and maintain a safe state, during an accident caused by external hazards [16]</u> . |          | For clarification, the fact that hazard protection and mitigation features include these equipment has added in 2.8, using the wording in draft DS508 referring SSG-54, which in the appropriate publication which define the 'Non-permanent equipment'. Non-permanent equipment may play a role in a specific plant status, but it should be covered by recommendation to maintain the fundamental safety functions for all plant status. As a lesson learned from the Fukushima accident, many operators have indeed deployed large amounts of non-permanent equipment, but this is one of methodologies, and we do not wish to refer to this equipment in any particular way here, as some operators are also considering the addition of special permanently installed facilities or the modification of existing safety systems to cope with plant conditions of higher severity. |
| NUSSC<br>Korea 06   | 3.08.               | 3.8. Hazard management is required to be integrated with the nuclear and radiation safety programme (See Requirements <del>8 and 23</del> 17-24 of IAEA SSR-2/2 (Rev.1) [1]).  | Nuclear and radiation safety programme of IAEA SSR-2/2 is closely related to 'Operational Safety Program,' including AMP and radiation protection programme.   | X        |   |          |  |
| NUSSC<br>India 05   | 3.08.               | Hazard management is required to be integrated with the nuclear and radiation safety and nuclear security  | Safety and security are complementary.   |          |   | X        | The interface with security is followed up in paragraph 1.15.  |
| NUSSC<br>Germany 06 | 3.08.               | ... (§see Requirements 8 and 23...   | Editorial  | X        |   |          |  |
| NUSSC<br>Libya 05   | 3.09.               | The set of hazard management measures should be structured, documented and associated <del>to</del> with management [...]  | Improved grammar.  | X        |   |          |  |
| NUSSC<br>Korea 07   | 3.09.               | Further recommendations on the management of plant operations are provided in NS-G-2.4 [12] ...  | Typo. Delete ')  | X        |   |          |  |
| NUSSC<br>Libya 06   | 3.10.               | [...]consideration also include the degree of safety significance of the <u>site -specific</u> hazards, [...]  | It seems that <u>site specific</u> is missing a hyphen.  |          |   | X        | In the IAEA publications (e.g. SSG-9, SSG-18, etc.) and the IAEA Safety Glossary (2018 edition), the word used without a hyphen. To keep a consistency with these documents, we would like to keep it without hyphenation.   |
| NUSSC<br>Germany 07 | 3.10.               | ... site-specific hazards ...  | Editorial  |          |   | X        | In the IAEA publications (e.g. SSG-9, SSG-18, etc.) and the IAEA Safety Glossary (2018 edition), the word used without a hyphen. To keep a consistency with these documents, we would like to keep it without hyphenation.   |

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| NSGC<br>France 01-01     | 3.25.     | Avoid the term “physical protection” and replace it by “nuclear security” in the entire document.  | To be in line with the NSS wording.  | X        |   |          | According to “Nuclear Security Glossary” (2015), when the context is clearly nuclear material and nuclear facilities, physical protection and nuclear security may be considered synonymous. Nevertheless, ‘nuclear security’ seems more frequently used in Safety Standards.   |
| NUSSC<br>Egypt 03        | 4.02.     | “the operation of the plant (see Requirement 23 of SSR-2/2 (Rev. 1) [1]) and SSG-3 <del>XXX</del> [28]”  | The reference SSG-3 needs a specific number (it should be [28]) here as well as in the references section  | X        |   |          |   |
| NUSSC<br>Korea 08        | 4.02.     | Site-specific aspects (...) are also required to be considered in the plant design and safety assessment against internal hazards (see Requirement 17 of SSR-2/1 (Rev. 1) [2] and SSG-3 [XX]), and the operation of the plant (see Requirement 23 of SSR-2/2 (Rev. 1) [1]) and SSG-3 [XX]. | SSG-3 [XX] is related to plant design and safety assessment. It seems to be better that SSG-3 follows just after Req. 17 of SSR-2/1.   | X        |   |          |   |
| NUSSC<br>Germany 08      | 4.03.     | ... (See Section 7) ...  | Editorial  | X        |   |          |   |
| NUSSC<br>Egypt 04        | 4.04.     | “Safety assessment of nuclear power plants are given in SSG-64 [4] and SSG-3 <del>XXX</del> [28].”   | The reference SSG-3 needs a specific number (it should be [28]) here as well as in the references section  | X        |   |          |   |
| NUSSC<br>Libya 07        | 4.06.     | [...] <del>in order</del> to ensure that the hazard prevention, protection, and mitigation measures are not reduced. [...]   | Improved clarity.  | X        |   |          |   |
| NUSSC<br>Germany 09      | 4.09.     | Recommendations for design related aspects of internal hazards are provided in IAEA SSG-64 [4]. For all credible internal hazards <u>including combined ones</u> (see Section 6), the general recommendations given in paragraphs 4.1–4.8 are applicable.                                  | In general, hazard combinations (so-called combined hazards) need to be addressed – this is also part of SSG-64 and therefore needs to be mentioned here for clarity.  | X        |   |          |   |
| NUSSC<br>Germany 10      | 4.10.     | <del>Dropped Load and Falling Objects and impact of these on SSCs; Collapse of structures and falling objects with a focus on heavy load drop;</del>   | For consistency with SSG-64  | X        | HEAVY LOAD DROP   |          | Made consistent with the title of sub-section in CONTENTS of DS494, not in para 1.5 of DS494.   |
| NUSSC<br>Germany 11      | 4.10.     | Release of hazardous substances <del>inside the plant originating from within the site.</del>  | For consistency with SSG-64  |          |   | X        | Made consistent with the title of sub-section in CONTENTS of DS494 (the version endorsed by CSS), not in para 1.5 of DS494.   |
| NUSSC<br>Libya 08        | 5.01.     | Hazard management for protection against external hazards should be based on the identification of site-specific external hazards and plant vulnerabilities. [...]   | Improved grammar.  | X        |   |          |   |
| NUSSC<br>Libya 09        | 5.03.     | <del>Prior to</del> before establishing processes[...]   | Improved clarity.  | X        |   |          |   |
| NUSSC<br>Germany 12      | 5.08.     | ... The operating organization should define and take into account all additional hazards that can be generated by an original hazard, and also define credible combinations of hazards according to SSG-64 [4] (see Section 6)  | Please add reference on SSG-64 for combinations of hazards   | X        |   |          |   |
| EPReSC<br>South Africa 2 | 5.14.     | Consider clarifying or defining “external explosions” for better understanding of such hazard.   | External explosion could be any explosion that occur outside the facility however, such explosion have adverse impact to the NPP. On the other hand, an external explosive can be dropped in the nuclear plant and cause an explosion. Both of these are not internal hazards, but the later occur internally. | X        | II. 67. To ensure that external explosion (deflagrations and detonations) with or without fire, with or without secondary missiles are included in the hazard management, the operating organization should consider and include specific actions derived from the results of the design and assessments performed on the basis of the recommendations in SSG-68 [6]. |          | The external hazards for which operational measures and procedures are recommended to be identified in DS503 are in the scope based on design and safety assessment, as described in para 5.2 etc. For example, external explosions, as defined in NSG-1.5 and its amendment SSG-68 (DS498), include explosions from on-site or off-site sources, with or without fire, that can affect NPPs. The detail scope of each hazard is outside the scope of this DS503 and will not directly be reflected in this document. However, in Appendix II, for External Explosions, Hazardous Substances, and Aircraft Crashes, the relationship to SSG-68 will be added to the beginning of each subsection, so that this will further clarify the stance of this guide. |
| NUSSC<br>Korea 09        | 5.14.     | ... hazard management for protection against <del>external hazards for</del> the following common external hazards:  | Typo. Delete duplication.  | X        |   |          |   |
| NUSSC<br>Egypt 13        | 6.00.     | Combination of hazards should be modified to be combination of internal and external hazards   | It should reflect the same explanation of the combination of internal and external hazards in the rest of the document   |          |   | X        | We need to describe combinations of hazards for: internal and internal, external and external, internal and external. The description in the proposal is misleading and will be kept as it is.  |
| NUSSC<br>Germany 13      | 6.01.     | Hazard management should take into consideration the effects of combined hazards according to SSG-64 [4] and mitigation strategies against these combined hazards.   | Please add reference on SSG-64 for combinations of hazards   | X        |   |          |   |
| NUSSC<br>Korea 10        | 6.03.     | ... but does not prescribe steps for each specific combination, nor <del>on</del> how to combine hazards.  | Typo.  | X        |   |          |   |
| NUSSC<br>Finland 1       | 6.05.     | ... hazard mitigation equipment for a certain hazard should <u>not</u> be stored in an area that is affected by another hazard <del>so</del> to ensure that equipment can be used in cases- <del>than</del> where both hazards already occurred.   | “Not” seems to be missing and there is some problem with the grammar.  | X        | For example, hazard mitigation equipment for a certain hazard should not be stored in an area that could be affected by another subsequent hazard, so that equipment can be used in cases where both hazards occur in combination.  |          |   |

| No.                      | Paragraph | Proposed new text   | Reason  | Accepted | Accepted, but modified as follows*<br>*Note that there are cases the draft text has modified from text in this column by editorial improvement   | Rejected | Reason for modification/rejection  |
|--------------------------|-----------|---|---|----------|--|----------|--|
| NUSSC<br>Korea 11        | 6.05.     | For example, hazard mitigation equipment for a certain hazard should be stored in an area that is <u>not</u> affected by <del>another the</del> hazard, so <u>the</u> equipment can be used in cases <del>than both that the</del> hazards already occurred.                                    | This paragraph is incomplete and misleading.<br><br>The resolution is interpreted as that a hazard equipment should be stored in the place free from all other hazards.<br>However, it is not practically possible to store a hazard equipment in the place free from all other hazards.<br>If we use 'should not' instead of 'may,' in corrected version, combinations of hazards should be limited to 'credible combinations', concerning storage of equipments against the hazards to occur in combination.<br>Considering para. 6.4, 'The goal of hazard management should be to ensure that the plant can withstand the impact of any credible combination of hazards and their effects. --', I'd like to propose the change of the current corrected version: | X        | The operating organization should review the applicability of operating procedures and deployment of the necessary mitigation equipment for each individual hazard taking into account the potential effects of the <u>credible</u> combinations of hazards applicable at the site. [...] For example, hazard mitigation equipment for a certain hazard should not be stored in an area that could be affected by another <u>subsequent</u> hazard, so that equipment can be used in cases where both hazards occur in combination.  |          |  |
| RASSC<br>Germany 01      | 6.05.     | For example, hazard mitigation equipment for a certain hazard should be stored in an area that is <u>not</u> affected by another hazard so equipment can be used in cases <u>than</u> both hazards already occurred.  | Not correctly integrated from comment "Russian Federation 12"   | X        | For example, hazard mitigation equipment for a certain hazard should not be stored in an area that could be affected by another subsequent hazard, so that equipment can be used in cases where both hazards occur in combination.   |          |  |
| NUSSC<br>Finland 2       | 6.06.     | Consider moving to another place or deleting the sentence "For example, anticipation and consideration for a combination of hazards categorized as unrelated (independent) events [4] might not be recommended unless the combination of events is shown to have a sufficient probability [5]." | The sentence is background information and may be confusing between sentences related to actions in the case of occurrence of simultaneous unrelated hazards.   | X        | 6.6[...] The personnel should then follow the accident management programme for the site as a whole, in accordance with Requirement 19 of SSR-2/2 (Rev. 1) [1] and the recommendations provided in SSG-54 [16]. For example, anticipation and consideration for a combination of hazards categorized as unrelated (independent) events [4] might not be <u>established/recommended</u> unless the combination of events is shown to have a sufficient probability <u>in the safety assessment</u> [6]. The operating organization should maintain situational awareness when responding to such <u>unrelated events that have not been anticipated in the safety assessment</u> and should use judgment to ensure the fundamental safety functions are maintained. [...] |          | We agree that the statement was made in such a way as to cause confusion. This sentence is an example of an event that is not anticipated in the safety assessment, and in relation to the text before and after this sentence, we would like to maintain the example itself, but amend the entire paragraph by deleting or adding wording so that it can be read without confusion. |
| NUSSC<br>Libya 10        | 6.08.     | [...]different external organizations might need to be involved <del>for</del> <u>in</u> certain hazards. [...]   | Improved grammar.   | X        | [...]different external organizations might need to be involved <u>in the response for certain hazards</u> . [...]   |          |  |
| NUSSC<br>Libya 11        | 6.09.     | [...]strategies for coping with hazard impact <del>on the basis of based on</del> the significance of effects on the plant and the frequency of occurrence.[...]  | Improved clarity.   | X        |  |          |  |
| NUSSC<br>Finland 3       | 7.02.     | ... an initially considered hazards ...   | Hazard in singular  | X        |  |          |  |
| NUSSC<br>Korea 12        | 7.02.     | <del>–</del> Hazard management should be reviewed ...   | Typo. Delete '-'  | X        |  |          |  |
| RASSC<br>Germany 02      | 7.02.     | If there is a reassessment of the severity of an initially considered hazards or the ability to withstand this hazard in the specific stage of plant life:  | Typo  | X        |  |          |  |
| NUSSC<br>South Africa 01 | 7.02.     | Hazard management should be reviewed and updated in the following cases:<br>– As part of the Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants as described in SSG-48  | Depending on severity, ageing effects and degradation mechanisms may introduce new or additional hazards.   | X        |  |          |  |
| NUSSC<br>South Africa 03 | 7.02.     | "an initially considered <u>hazard</u> "  | Incorrect grammar.  | X        |  |          |  |

| No.                    | Paragraph | Proposed new text  | Reason   | Accepted | Accepted, but modified as follows*<br>*Note that there are cases the draft text has modified from text in this column by editorial improvement   | Rejected | Reason for modification/rejection   |
|------------------------|-----------|--|--|----------|--|----------|---|
| NUSSC<br>Germany 14    | 7.02.     | The method for hazard analysis and the development of hazard management should be consistent with the plant design bases and the design assumptions. _ Hazard management should be reviewed and updated in the following cases:<br>– If additional hazards or hazard combinations are identified <u>according to SSG-64 [4]</u> ;<br>...<br>- As part of a re-licensing application;<br>...<br>- If new or updated information for a site-specific event shows that the current design basis and design assumptions for hazard mitigation measures or strategies might be inadequate, including cliff_ edge effects or challenges to multiple layers of defence in depth that were not previously identified or addressed. | Editorial<br>Please add reference on SSG-64 for combinations of hazards<br>Concerning<br>“cliff-edge effects” – the same for para. 7.5, Line 3   | X        | 7.2.The method for hazard analysis and the hazard management should be consistent with the plant design bases and the design assumptions. Hazard management should be reviewed and updated in the following cases:<br>–If additional hazards or hazard combinations are identified according to SSG-64 [4];<br>–If there is a reassessment of the severity of an initially considered hazard or the ability to withstand this hazard in the specific stage of the plant’s lifetime;<br>–As a part of the ageing management and programme for long term operation, as described in SSG-48 [26]<br>–As part of a re-licensing application;<br>–As part of a periodic safety review, as described in SSG-25 [12];<br>–If new or updated information for a site-specific event shows that the current design basis and design assumptions for hazard mitigation measures or strategies might be inadequate, including information on cliff edge effects or challenges to multiple layers of defence in depth that were not previously identified or addressed. |          | In the IAEA publications (e.g. SSG-2, draft safety guide DS498, etc.) and the IAEA Safety Glossary (2018 edition), the word 'cliff edge' used without a hyphen. To keep a consistency with these documents, we would like to keep it without hyphenation. |
| NUSSC<br>Libya 12      | 7.05.     | [...] <u>Cliff-edge</u> effects can be identified.   | It seems that <b>cliff edge</b> is missing a hyphen.   |          |  | X        | In the IAEA publications (e.g. SSG-2, draft safety guide DS498, etc.) and the IAEA Safety Glossary (2018 edition), the word used without a hyphen. To keep a consistency with these documents, we would like to keep it without hyphenation.              |
| NUSSC<br>Germany 15-01 | 7.06.     | structures, systems and components   | For consistency reasons and better understanding: perhaps the abbreviation SSCs should be replaced by full wording   | X        |  |          |   |
| NUSSC<br>Egypt 05      | 7.09.     | The guidance for the periodical update on climate change information is provided in IAEA SSG-18 <del>[XX]</del> [29].  | The reference SSG-18 needs a specific number (it should be [29]) here as well as in the references section   | X        |  |          |   |
| NUSSC<br>Germany 15-02 | 7.11.     | structures, systems and components   | For consistency reasons and better understanding: perhaps the abbreviation SSCs should be replaced by full wording   | X        |  |          |   |
| NUSSC<br>Germany 15-03 | 8.02.     | structures, systems and components   | For consistency reasons and better understanding: perhaps the abbreviation SSCs should be replaced by full wording   | X        |  |          |   |
| NUSSC<br>Germany 16    | 8.02.     | - Ensuring that fire <u>extinguishing equipment is present</u> <del>extinguishers are</del> on site and operable;  | More comprehensive requirement   | X        |  |          |   |
| NUSSC<br>Finland 4     | 9.04.     | Submersible pump   | Please check the correct term submerged or submersible pump  | X        |  |          |   |
| NUSSC<br>India 06      | 9.04.     | Adequate diesel inventory to be added  | Hazard protection measure should ensure adequate diesel inventory for extended SBO and disruption in normal supply of diesel.  | X        | On-site mobile equipment and features for mitigating hazard effects, such as emergency vehicles, submersible pumps, mobile diesel generators with adequate fuels;  |          |   |
| NUSSC<br>Germany 17    | 9.04.     | - Access <u>routes</u> and escape routes for hazard response personnel;  | Editorial for consistency with SSG-64  | X        |  |          |   |
| NUSSC<br>Germany 18    | 9.05.     | - Deploying alternative mobile equipment for spray water for the reactor or for spent fuel <del>pit</del> pool and electrical power supply;  | Consistent terminology   | X        |  |          |   |
| NUSSC<br>Egypt 07      | I.03.     | Further guidance of the significance of safety classification of SSCs for fire protection systems are given in the SSG-30 <del>[XX]</del> [30].  | The reference SSG-18 needs a specific number (it should be [30]) here as well as in the references section   | X        |  |          |   |
| NUSSC<br>Korea 18      | I.03.     | SSCs are adequately protected to ensure that the consequences of a single fire will not <u>prevent those systems from performing their required function</u> <del>result in the loss of capabilities of those SSCs to perform their intended safety functions</del> , taking into account the effects of the worst single failure.   | Align with expression in the foot note 17 of Requirement 25 single failure criterion, SSR-2/1.   | X        |  |          |   |
| NUSSC<br>Germany 22    | I.03.     | ... SSCs are adequately protected to ensure that the consequences of a single fire will not prevent those systems from performing their required function, taking into account the effects of the worst single failure <u>of active fire protection features</u> .   | “active fire protection features” was added to clarify the context. Practically these are automatic fire fighting systems as well as fire dampers and doors with hold-open devices that influence the ventilation in case of fire. | X        |  |          |   |
| NUSSC<br>Japan 3       | I.06.     | Plant personnel <u>and external personnel (e.g. off-site firefighters)</u> engaging in activities relating to fire safety should be appropriately qualified and trained so as to have a clear understanding of their specific areas of responsibility and how these might interface with the responsibilities of other individuals, and should have an understanding of the potential consequences of errors. <u>Also, external personnel (e.g. off-site firefighters) engaging in activities relating to fire safety should be appropriately trained so as to have a clear understanding of specific natures of relevant nuclear power plants.</u>  | The role of external personnel may differ from the one of plant (on-site) personnel in operating organization. So The role should be stated separately.  | X        |  |          |   |
| NUSSC<br>Finland 5     | I.09.     | “amounts of”   | “of” should not be deleted.  | X        | I.9.Procedures should be established for the purpose of ensuring that amounts and reaction to <u>fire of</u> combustible materials (the fire load) and[...]  |          |   |

| No.                  | Paragraph | Proposed new text   | Reason   | Accepted | Accepted, but modified as follows*<br>*Note that there are cases the draft text has modified from text in this column by editorial improvement  | Rejected | Reason for modification/rejection  |
|----------------------|-----------|---|--|----------|---|----------|--|
| NUSSC<br>France 02   | I.09.     | Procedures should be established for the purpose of ensuring that <del>fire rating</del> and amounts <del>and reaction to</del> of combustible materials (the fire load) and ignition sources (number, intensity, frequency) be minimized in areas containing items important to safety and in adjacent areas that might present a risk of exposure to fire for items important to safety.  | clarification  | X        | I.9.Procedures should be established for the purpose of ensuring that amounts and reaction to fire of combustible materials (the fire load) and ignition sources (number, intensity, frequency) be minimized in areas containing items important to safety and in adjacent areas that might present a risk of exposure to fire for items important to safety.   |          | The sentence was corrected.<br>"fire rating" is more commonly used for fire barriers or fire wall (which should not be minimized) than for fire loads in industry. (It can be applied for cabling or polymer products, however the wording "fire load" is enough to express the recommendation.)   |
| NUSSC<br>Egypt 08    | I.10.     | The fire mitigation measures should be identified and designed in accordance with their impact on nuclear safety (Ref. SSG-30 <del>{XX}{30}</del> ).  | The reference SSG-18 needs a specific number (it should be [30]) here as well as in the references section   | X        |   |          |  |
| NUSSC<br>Egypt 09    | I.13.     | Further guidance of the significance of safety classification of Structures, Systems and Components for fire protection systems are given in the SSG-30 <del>{XX}{30}</del> ).  | The reference SSG-18 needs a specific number (it should be [30]) here as well as in the references section   | X        |   |          |  |
| NSGC<br>France 01-02 | I.20.     | Avoid the term "physical protection" and replace it by "nuclear security" in the entire document.   | To be in line with the NSS wording.  | X        |   |          | Same as NSGC France 01-01.   |
| NUSSC<br>Finland 6   | I.25.     | ... maximum permissible fire load in <u>each fire area</u> .  | The purpose of the addition "defined in the hazard analysis" is not quite clear. Consider keeping the original formulation.  | X        | Records should be maintained that document the estimated or calculated actual fire load as well as the <u>defined</u> maximum permissible fire load for <u>each fire compartment defined in the hazard analysis</u> .   |          |  |
| NUSSC<br>France 03   | I.25.     | The total fire load in each area identified as important to safety should be maintained as low as reasonably practicable, with account taken of the fire resistance rating of the compartment boundaries. Records should be maintained that document the estimated or calculated existing fire load as well as the maximum permissible fire load in the hazard analysis. <del>In addition, combustible materials allowed in each area, in terms of nature, location, and maximum amount, should be defined and documented</del>   | The maximum allowed fire load record is not a sufficient parameter to manage fire risk due to materials. The nature and location play a role as well.  | X        |   |          |  |
| NUSSC<br>Germany 23  | I.31.     | The amounts of flammable <del>or combustible</del> liquids introduced into fire areas during maintenance or modification activities should be limited to the amount needed for daily use.<br><i>The terms "flammable" and "combustible" should be used according to the "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)" issued by the UNECE.</i><br><a href="https://unecce.org/fileadmin/DAM/trans/danger/publi/ghs/ghs_rev08/ST-SG-AC10-30-Rev8e.pdf">https://unecce.org/fileadmin/DAM/trans/danger/publi/ghs/ghs_rev08/ST-SG-AC10-30-Rev8e.pdf</a><br><i>According to the GHS the term "combustible liquid" would only be used as "hazard statement" and became another meaning than used to be.</i> | Para. I.31, first bullet is taken from para.6.7(i) of NS-G-2.1. But also, all over the document it is distinguished between "flammable" liquids and "flammable" and "combustible" liquids.<br><br>Since "flammable" and "combustible" are not defined by IAEA, the logic behind is not clear.<br>The current logic might refer to the old distinction of "flammable" and "combustible" based on the flash point below/above 37.8 C, as it was used in US and British standards.<br>For fluids the old classification "combustible" is not valid anymore, since the new "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)" of the UN does only use "flammable" and a number.<br>Cf. UK reference: Link<br><br>Cf. US reference: Link<br><br>Please check the following link that also mentions the countries that al-ready implemented the GHS: Link | X        | I.31.Controls for liquids should take into account the following:<br>-The amounts of <u>flammable or combustible liquids</u> introduced into fire compartments during maintenance or modification activities should be limited to the amount needed for daily use. Suitable fire protection measures such as the provision of portable fire extinguishers should be taken, as appropriate.<br>-Approved containers or dispensers should be used whenever possible for the transport and use of flammable <del>or combustible</del> liquids. Openings in containers should be fitted with spring loaded caps. Transport of flammable <del>or combustible</del> liquids in open containers should be prohibited.<br>-If it is necessary to store small amounts of flammable <del>or combustible</del> liquids within a working area, cabinets of an approved design for <u>flammable</u> liquids should be used.<br>-All containers of flammable <del>or combustible</del> liquids should be clearly and prominently labelled to indicate their contents.<br>-Stores of large quantities of flammable <del>or combustible</del> liquids should be located and protected such that they do not compromise safety. Such bulk storage areas should be separated from other plant areas by fire rated compartmentation or by spatial separation with suitable fire protection measures taken as appropriate.<br>-Warning signs should be placed at storage areas for flammable <del>or combustible</del> liquids. |          | As comment, the new definition of the GHS should be applied here. On the other hand, recommendations for the "amount" of combustible materials as fire loads, irrespective of their flash point, continue to be indicated "flammable or combustible"(e.g. gear and cylinder oils with a flash point above 93°C for liquids).<br><br>In other part, we kept "combustibles", "(flammable or) combustible solids, liquids, and gases" or "combustible materials". |
| NSGC<br>France 01-03 | I.43.     | Avoid the term "physical protection" and replace it by "nuclear security" in the entire document.   | To be in line with the NSS wording.  | X        |   |          | Same as NSGC France 01-01.   |
| NUSSC<br>Germany 24  | I.43.     | - Consideration for inadmissible effects of firefighting (e.g. the use of water or other extinguishing media) for SSCs important to safety (e.g. measuring converters on the bottom level of the reactor annulus), when the subsequent internal flooding is defined as credible combination of hazards <u>according to SSG-64 [4]</u> .   | Please add reference on SSG-64 for combinations of hazards   | X        |   |          |  |
| RASSC<br>Germany 04  | I.44.     | The manual firefighting capability might be provided by <del>a</del> suitably trained and equipped on-site firefighters, by a qualified off-site service or by a co-ordinated combination of the two, as appropriate for the plant and in accordance with national practice.  | Typo   | X        |   |          |  |



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|---------------------|-----------|---|---|----------|--|----------|--|
| NUSSC<br>USA 01     | I.47.     | If an on-site firefighting organization is established to provide a manual firefighting capability, the firefighter's organization, minimum staffing level, equipment (including self-contained breathing apparatus) and training should be documented, and their adequacy should be confirmed by a competent person.   | Enhance clarity   | X        |  |          |  |
| NUSSC<br>USA 02     | I.48.     | Members of the firefighting organization should be physically capable of performing firefighting duties and should attend a formal programme of firefighting training prior to assignment to the plant firefighters. Regular training (routine classroom training, firefighting practice and fire drills) should be provided for all on-site firefighters members. Special training should be provided for firefighters in leadership positions to ensure that they are competent to assess the potential safety consequences of a fire and provide advice to control room personnel. | Enhance clarity   | X        |  |          |  |
| NUSSC<br>Germany 25 | I.54.     | The potential formation of an explosive atmosphere should be avoided or limited using non-flammable liquids or processes (such as water-based solvents, operating contamination monitors with inert gases, using low pressure oil cooling systems, recombining hydrogen emissions from battery charging).   | Important practical example added.<br><br>*This comment was removed with the following additional information:<br>this proposal is about the formation of explosive atmosphere by oil mist. The risk of formation of an explosive oil mist cloud depends on the potential of the flammable fluid to break-up into small particles when being released out of the system. This is determined by system properties like temperature, pressure and leak size, as well as fluid oil properties like viscosity, density, surface tension, and flash point. As it is not the goal in standards to mention in details all the complex oil properties, our experts mentioned the system property "low pressure" as one decisive factor. A recent research work addressing this topic can be found under rr1107.pdf (hse.gov.uk).<br>However having checked back with our experts the state of discussion at international level, this topic is relatively recent and not widely discussed. As further discussions seems to be needed on this topic, we propose to remove this proposal at this stage. | -        |  | -        | Thank you very much for providing important insight.   |
| NUSSC<br>Germany 26 | I.56.     | Active and passive protection systems means (such as gas detectors, blast doors, blowout panels, room and area ventilation systems, venting safety devices) ...   | More comprehensive requirement  | X        |  |          |  |
| NUSSC<br>Germany 27 | I.58.     | Containers of compressed gases that sustain fires, such as oxygen or the EDG starting air system, are properly secured and are stored separately from flammable gases and away from combustible materials and ignition sources;   | Important practical example added, especially as in this area is diesel fuel and fire experience.   |          |  | X        | The location of the permanently installed equipment, such as EDG start-up air system is determined as the plant design. This is a recommendation for cylinders brought in for maintenance work etc. For example, acetylene gas used as a cover gas for welding would be a good example.  |
| NUSSC<br>Germany 28 | I.58.     | Where a supply of flammable gas is needed inside a building for permanent use, it is supplied from cylinders or a bulk storage area safely located outside the building in a dedicated storage area such that a fire affecting the storage area would not compromise safety. Pipework from the bulk storage into the safety-related areas should be equipped with automatic stop valves to stop supply in case of fire or pipe break.   | Important practical example added, especially as in this area is diesel fuel and fire experience.   |          |  | X        | Avoid duplication with SSG-64 (such as para 4.12).   |
| NUSSC<br>India 10   | I.87.     | The ageing management programme for the lifting equipment should be established to ensure that the number of load cycles during the lifetime of equipment is consistent with the result of the fatigue analysis. The ageing management programme for the civil structure on which the overhead crane is mounted, specially for old NPP, should also be established.   | Health of civil structure where ultimately the load lifted by crane is transferred should be covered under ageing management programme for the lifting equipment.   |          |  | X        | We have clarified the relationship between ageing management and hazard management by referring SSG-48 in Section 7. The suggested description is specific and does not relate to only hazard management but to ageing management in general, and will not be reflected as such.   |
| RASSC<br>Germany 05 | I.96.     | However, the operating organization should consider the effects of hazardous substances on control room operators and the habitability of control rooms.  | Typo  | X        |  |          |  |
| NUSSC<br>Germany 29 | I.96.     | RELEASE OF HAZARDOUS SUBSTANCES INSIDE THE PLANT BOUNDARY   | Consistency with SSG-64   |          |  | X        | Made consistent with the title of sub-section in CONTENTS of DS494 (the version endorsed by CSS). There is possibility that changes have been made during the publication process of SSG-64, but as the final harmonization will be done during the DS503's publication process, we would like to make consistency with the version that has been endorsed by CSS. |

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|----------------------|-----------|--|---|----------|---|----------|--|
| NUSSC<br>Egypt 10    | II.00.    | It is proposed to cover the area related to <b>military radar stations and other military installations which include hazardous materials are handled, stored and used, and may be associated with hazardous activities such as firing range practice and handling of munitions. In particular, military airports and their associated air traffic systems, including training areas, should be considered potential sources.</b>  | This hazard should be handled in a special way if the bombing and firing ranges are within the NPP site. Information is not easily available for military sites, information should be collected through Governmental channels to obtain the necessary information about the activities on the bombing and firing ranges and other activity related to the military. The history of events and incidents outside the designated area relating to their activities should be used in the assessment. Information on the frequency of overhanging ordnance, flight path(s) taken to a recovery site, and frequency of dropped ordnance should be collected. A confidentially agreement may need to be signed to not disclose any information. | X        | II. 67. To ensure that external explosion (deflagrations and detonations) with or without fire, with or without secondary missiles are included in the hazard management, the operating organization should consider and include specific actions derived from the results of the design and assessments performed on the basis of the recommendations in SSG-68 [6].<br>II. 69. To ensure that hazardous substances including toxic, flammable, corrosive and asphyxiant chemicals and their mixtures in air and liquids, as well as radiological hazards from other on-site and collocated installations are included in the hazard management, the operating organization should consider and include specific actions derived from the results of the design and assessments performed on the basis of the recommendations in SSG-68 [6].<br>II. 75. To ensure that accidental aircraft crash is included in the hazard management, the operating organization should consider and include specific actions derived from the results of the design and assessments performed on the basis of the recommendations in SSG-68 [6]. |          | The external hazards for which operational measures and procedures are recommended to be identified in DS503 are in the scope based on design and safety assessment, as described in para 5.2 etc. For example, military missiles, whether explosive or not, are specifically excluded from consideration in the safety design in SSG-68(DS498). The detail scope of each hazard is outside the scope of this DS503 and will not directly be reflected in this document. However, in Appendix II, for External Explosions, Hazardous Substances, and Aircraft Crashes, the relationship to SSG-68 will be added to the beginning of each subsection, so that this will further clarify the stance of this guide. |
| NUSSC<br>Korea 19    | II.01.    | ... the general recommendations for <del>mitigation mitigating</del> and coping with external hazards ...  | Use the same expression as that in para. I.1.   | X        |   |          |  |
| NUSSC<br>Germany 30  | II.04.    | ... If a seismic event and a subsequent tsunami are defined, <u>according to SSG-64 [4]</u> , as a credible combination of hazards, the operating organization should, consider the response and ensure the plant is adequately protected against the tsunami (for example, flood protection gates being in place).  | Please add reference on SSG-64 for combinations of hazards  | X        |   |          |  |
| NUSSC<br>Korea 20    | II.05.    | The operating organization should check the monitoring systems <u>used</u> to determine the expected type and level of damage to the plant and take appropriate actions for that damage level.   | More clear expression is recommended.   | X        |   |          |  |
| NUSSC<br>Germany 31  | II.06.    | ... post-event monitoring ...  | Editorial   | X        |   |          |  |
| NUSSC<br>Japan 4     | II.08.    | To ensure that external floods (storm surges and tsunamis) are included in hazard management, the operating organization should consider and include specific actions derived from the results of the design and the assessments performed on the basis of the recommendations provided in SSG-68 [6]. For example, in areas where tsunami hazards could occur, the tsunami flooding analysis might identify risks to <u>SSCs, important to safety, e.g. the emergency generators, and electrical distribution systems, and sea water system for the ultimate heat sink. The impact of tsunami backrush on sea water system should also be taken into account.</u> The impacts of tsunamis and storm surges are not limited to flooding, and in coastal areas the extensive and sudden movement of soft sediments or biological material also has the potential to affect the water intake system. | Completeness.<br>Impact of tsunami on UHS is also important and to be mentioned.<br>More generally, impact on SSCs important to safety should be considered.<br>In addition, effect of tsunami backrush should also be considered.  | X        |   |          |  |
| NSGC<br>France 01-04 | II.32.    | Avoid the term "physical protection" and replace it by "nuclear security" in the entire document.  | To be in line with the NSS wording.   | X        |   |          | Same as NSGC France 01-01.   |
| NUSSC<br>Germany 32  | II.32.    | - Identify the appropriate operating procedures for ...  | Editorial   | X        |   |          |  |
| NUSSC<br>Germany 33  | II.33     | If extreme precipitation is defined as a credible combination of hazards with extreme winds ( <u>see also SSG-64 [4] for combinations of hazards</u> ), the operating organization should determine whether equipment for flooding should be put in place based on the anticipated severity of hazards.  | Please add reference on SSG-64 for combinations of hazards  | X        |   |          |  |
| RASSC<br>Germany 06  | II.34.    | Low sea water, which may be caused by <del>an</del> extremes of air pressure   | Typo  | X        |   |          |  |
| RASSC<br>Germany 07  | II.41.    | In addition, the recommendation in para II.29 for securing equipment outside of buildings in extreme wind events <u>should be considered to prevent objects from becoming missiles.</u>  | Typo  | X        |   |          |  |
| NUSSC<br>Germany 34  | II.45     | When ice storm (combination of high wind and super cooled rain, <u>see also SSG-64 [4] for combinations of hazards</u> ) is predicted in the area of the power grid from nuclear power plants, the operating organization should be prepared for the loss of external power caused by the rapid building up of an ice layer on overhead line conductors.   | Please add reference on SSG-64 for combinations of hazards  | X        |   |          |  |
| NUSSC<br>Germany 35  | II.57.    | The guidance provided in this <del>a</del> Appendix I ...  | Editorial   | X        |   |          |  |

| No.                      | Paragraph            | Proposed new text  | Reason   | Accepted | Accepted, but modified as follows*<br>*Note that there are cases the draft text has modified from text in this column by editorial improvement | Rejected | Reason for modification/rejection   |
|--------------------------|----------------------|--|--|----------|--|----------|---|
| NUSSC<br>France 04-01    | II.79.               | II.79. <b>If practicable</b> , the operating organization should develop a specific procedure for returning the reactor to a safe state when notified by the air traffic control organization of an aircraft crash potentially affecting the site.   | France has informed IAEA during MS consult that II.79 and II.80 do not seem applicable. Notably, the time between a declared emergency on an aircraft leading to its crash does not seem sufficient to contemplate any evacuation of personnel or implementation of procedure for the plant.<br>IAEA answers that it is not unreasonable and that the current text takes these into account because the same discussion took place in the previous review by review committees. This is not a sufficient argument to write a non applicable article.<br>The new proposal intends to achieve a consensus by adapting the articles | X        |  |          |   |
| NUSSC<br>France 04-02    | II.80.               | II.80. <b>If practicable</b> , the operating organization should develop a specific procedure for evacuating, relocating or sheltering non-essential plant personnel and personnel necessary for emergency response when notified <b>with sufficient time</b> by the air traffic control organization of an aircraft crash potentially affecting the site (e.g. to a bunkered supplementary control room instead of an unprotected main control room). | France has informed IAEA during MS consult that II.79 and II.80 do not seem applicable. Notably, the time between a declared emergency on an aircraft leading to its crash does not seem sufficient to contemplate any evacuation of personnel or implementation of procedure for the plant.<br>IAEA answers that it is not unreasonable and that the current text takes these into account because the same discussion took place in the previous review by review committees. This is not a sufficient argument to write a non applicable article.<br>The new proposal intends to achieve a consensus by adapting the articles | X        |  |          |   |
| NUSSC<br>India 11        | II.85.               | _ large scale bacterial/viral attack like COVID-19 pandemic.<br>(Additional point)   | Self explanatory   |          |  | X        | This guide does not address societal or pathological hazards (e.g. pandemic) that do not directly impact the safety of the nuclear power plant. This was discussed in previous review phase and mentioned in Section 1 Scope. As footnote notes; Recommendations to ensure the safety of personnel and the safe operation of nuclear power plants during situations in which a large number of personnel might be unavailable, such as during an epidemic or pandemic, are provided in IAEA Safety Standards Series No. DS497C (revision of NS-G-2.4) |
| NUSSC<br>India 12        | II.92.<br>(new para) | For pandemic like situation, operating organization may keep an alternate set of operators, isolated from regular set of operators, to take charge of plant, in case of enmasse infection of regular operators.  | To ensure and monitor essential plane safety function  |          |  | X        | See the reason for NUSSC India 11.  |
| NUSSC<br>Egypt 11        | References           | INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Power Plants: Commissioning and Operation, IAEA Safety Standards Series No. SSR-2/2 (Rev.1), IAEA, Vienna (2016) <del>(2014)</del> .   | The IAEA Safety Standards Series No. SSR-2/2 (Rev.1) is issued in 2016   | X        |  |          |   |
| NUSSC<br>Egypt 12        | References           | <del>[31]</del> . INTERNATIONAL ATOMIC ENERGY AGENCY, Volcanic Hazards in Site Evaluation for Nuclear Installations, IAEA Safety Standard Series No. SSG-21, IAEA, Vienna (2012).  | The reference number needs a modification as well as its order in the references list according to its citation sequence in the document.  | X        |  |          |   |
| NUSSC<br>South Africa 02 | References           | Proposed new reference:<br>Development of a Programme for Long Term Operation of Nuclear Power Plants [SSG-48]   | To take into account the addition of the new reference. It is also important to specifically make a reference to SSG-48 since there is a requirement in SSG-48 that the entire planned period of long term operation should be considered for review.  | X        |  |          |   |