**Comments Report – Public Consultation**
**Draft Guidance Document: RD/GD-98, *Reliability Programs for Nuclear Power Plants***
Public consultation: January 9 – February 23, 2012;

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| 1 | Hydro-Quebec | General (F) | Dans ce document, il existe beaucoup d'interrelation et de complémentarité entre le S-99 (ou le RD-99.1 et GD-99.1), le S-210 (ou RD/GD-210) et le S-294.<br>Dans ce document, il n'est pas clair (partage des exigences) d'identifier ce qui relève de la portée de chacun de ces documents.<br>L'usage de plusieurs documents pour préciser les attentes ou exigences de la CCSN concernant le programme de fiabilité engendre de l'incohérence et de la confusion.<br>Le RD/GD-99.1 et RD/GD-210 sont actuellement en processus de commentaires. Il faut s'assurer que les documents qui en résulteront seront complets et cohérents avec RD/GD-98.<br>HQ désire pouvoir faire des commentaires supplémentaires si requis sur le RD/GD-98 lorsque les versions finales du RD/GD-99.1 et RD/GD-210 seront publiés. | Clarifier les exigences qui relèvent de chacun des documents S-99 (ou le RD-99.1 et GD-99.1), RD/GD-98, S-210 (ou RD/GD-210) et S-294.<br>Éviter d'écrire ou de répéter des exigences dans le RD/GD-98 qui relèvent des autres documents de la CCSN.<br>S'assurer d'une cohérence dans les exigences, termes et définitions entre les divers documents | Il est normal qu'il y ait une interrelation entre les documents réglementaires de la CCSN.<br>RD/GD-99.1 est destiné à inclure les exigences en matière de rapports soumis à la CCSN.<br>RD/GD-210 décrit les exigences du programme de maintenance et RD-98 décrit les exigences en matière du programme de fiabilité, et ces deux documents ne comportent pas de répétition des exigences.<br>Le présent document a été révisé pour s'assurer que les attentes qu'il contient ne chevauchent pas celles des documents d'application de la réglementation mentionnés. La révision n'a entraîné aucun changement. |

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| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| 2 | Hydro-Quebec, OPG | General (E) | In this document, there are numerous of relationships and complementarities between S-99 (or RD-99.1 and GD-99.1), S-210 (or RD/GD-210) and S-294. In this document, it is not clear what is within the scope of each regulatory document.<br>The use of several regulatory documents to specify expectations or requirements of the CNSC on the same or similar subjects concerning the reliability program generates inconsistency and confusion and may represent a regulatory risk.<br>RD/GD-99.1 and RD/GD-210 are currently in process of comments. It should be made sure that the documents which will be issued are complete, coherent and consistent with RD/GD-98. HQ would like to provide necessary additional comments on the RD/GD-98 once the final versions of the RD-99.1, GD-99.1 and RD/GD-210 are published. | Clarify the requirements and scope which concern each document: S-99 (or RD-99.1 and GD-99.1), RD/GD-98, S-210 (RD/GD-210) and S-294.<br>Avoid writing or repeating requirements in the RD/GD-98 which concern the other regulatory documents of the CCSN.<br>Ensure coherence in the requirements, terms and definitions between each document | Inter-relationships between the various CNSC regulatory documents are normal.<br>RD/GD-99.1 focuses on the requirements for reports submitted to the CNSC.<br>RD/GD-210 deals with the requirements for maintenance programs whereas RD/GD-98 deals with the requirements for reliability programs, so there is no repetition.<br>This document was reviewed to ensure there are no overlapping expectations with the noted regulatory documents. No changes were necessary as a result of this review. |
| 3 | Hydro-Quebec | Général (F) | À plusieurs endroits, le document manque de clarté ou de précision, ce qui occasionne de la confusion.<br>- Le modèle du rapport de fiabilité (Annexe B du GD-99.2) est plus détaillé et plus précis que le RD/GD-98.<br>Les termes, définitions ou descriptions sont, à plusieurs endroits, incohérents ou significativement différents de ceux du modèle de rapport de fiabilité (Annexe B du GD-99.2). | S'assurer que le RD/GD-98 est document complet, cohérent et clair qui respecte les pratiques reconnues dans l'industrie | Le modèle du rapport annuel de fiabilité relève des rapports qui seront soumis à la CCSN, il est, par conséquent tout à fait normal qu'il y ait plus de détails concernant la soumission de ce rapport dans le RD-99.1.<br>Les termes et les définitions ont été révises pour assurer la consistance avec GD-99.1 |
| 4 | Hydro-Quebec | General | The document lacks of clarity or precision.<br>The model of the reliability report (Appendix B of the GD-99.2) is more detailed and clear that the RD/GD-98.<br>The terms, definitions or descriptions are, in many sections, incoherent or significantly different from those of the | | Since RD-99.1 concerns reporting requirements, the document provides greater details about those requirements.<br>The terms and definitions have been reviewed against GD-99.1 to ensure consistency |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | model of reliability report (Appendix B of the GD-99.2). | | |
| 5 | NBPN | Section 1.2 | The reliability program is not relevant if the plant state is such that the system functions required to be monitored are not required to be available. | As a result it is improper to state that the reliability program applies to all phases of an NPP. For some phases of operations, some SIS are not required to be available. As a result the reliability monitoring and surveillance activities do not need to be carried out during these conditions for those respective system functions. It is suggested that the wording be modified as follows: *"However the general approach applies to all phases of an NPP's lifecycle (design, construction, commissioning, start-up, operation and decommissioning) when SIS are required to be available."* | Agreed. Change made. |
| 6 | Bruce Power | Section 1.2, third paragraph | The wording suggests that the requisite level of safety is ONLY met when SIS' are demonstrated reliable.<br>"Risk" and "overall levels of safety" are not specific terms in this respect.<br>Suggest changing this to reflect the multiple facets of safe operation, reliability being on element. | To demonstrate an overall level of safety, NPP operate within a defined safe operating envelope. An element of the safe operating envelope is the demonstration of the capability and availability of SIS to adequately perform their designed functions. Thus, the SIS at NPPs must function at a certain level of reliability. | Agreed. Change made. |
| 7 | Bruce Power | Section 1.3 | 1) What is the need for the specific reference to the generic requirements of paragraph 12 of the GNSCR in this document? There doesn't appear to be anything specific to reliability requirements.<br><br>2) Is it being added to every new RD? | Please clarify. | 1) Although the section does not explicitly relate to reliability requirements, paragraph 12(1)(d) refers to system design characteristics which could include the reliability performance of the system.<br>2) Each RD/GD will contain its own particular relevant legislation references as appropriate. |
| 8 | Bruce Power | Section 1.3 | Why is section 5 of the Class I regulations referred to in this document? The scope section already defines the document as being mainly for the operations phase of a plant, but generally applicable for all others (including construction). | Please clarify | Paragraph (b) of section 5 refers to the design and the design operating conditions which are linked to the reliability performance of the system. |

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| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| 9 | NBPN | Section 2 | Objective and requirements of reliability programs | NBPN agrees with the objectives and requirements | Comment noted. |
| 10 | OPG | Section 2.1 | The reliability program shall ensure that all SIS at an NPP function reliably, in accordance with the relevant design and performance criteria, including any safety goals of the NPP and CNSC licence requirements. | Clarification should be provided in the glossary for the term safety goals with respect to the reliability program. | Definition of "safety goals" is given in the glossary. |
| 11 | OPG | Section 2.2 | A reliability program for an NPP shall:<br>1) identify, using a systematic method, all SIS by:<br>a) identifying NPP structures, systems and components (SSCs) associated with the initiation, prevention, detection or mitigation of any failure sequence that could lead to damage of fuel, associated release of radionuclide or both<br>b) ranking the identified SSCs on the basis of their relative importance to safety<br>c) screening out SSCs that do not contribute significantly to plant safety (the remaining SSCs are the systems important to safety)<br>2) specify reliability targets for the SIS at the NPP<br>3) identify and describe the potential failure modes of the SIS at the NPP<br>4) specify the minimum capabilities and performance levels that the SIS must attain to achieve reliabilities that are consistent with NPP safety targets and regulatory requirements<br>5) provide information to the maintenance program to maintain the effectiveness of the SIS at the NPP<br>6) provide for inspections, tests, modelling, monitoring or other | 1) Should be clarified whether a *failure sequence* is intended to mean an initiating event. Suggest adding to Glossary.<br>2) Item 1a. is interpreted to include failure of process systems<br>3) Item f) the reliability targets for each of the SIS at the NPP already covered in Item 2.<br>4) SB: 1(b) The ranking of SIS has not been discussed or resolved. This needs to be clarified or removed. | 1) A failure sequence is synonymous with an accident sequence. There is no need to add the definition of either failure sequence or accident sequence to the glossary.<br>2) Yes that is the correct interpretation.<br>3) Item f concerns the documentation.<br>4) SIS ranking was clarified in Section 3.1.2, to specify that ranking should be performed according to accepted probabilistic importance measures. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | measures to effectively assess the reliability of the SIS at the NPP<br>7) include provisions to assure, verify and demonstrate that the program is implemented effectively<br>8) include provisions for recording and reporting the results of program activities, including the results of assessments, inspections, tests or monitoring of the reliability of the SIS at the NPP<br>9) clearly and comprehensively document the activities, attributes, elements, results and administration of the reliability program, including:<br>a) the activities that make up the program<br>b) procedures and schedules for conducting the program activities<br>c) the licensee's organization for managing and implementing the program, including the specific positions, roles and responsibilities of the persons involved<br>d) the methodology used to identify, rank and assign reliability targets to the SIS at the NPP<br>e) the list of SIS at the NPP<br>f) the reliability targets for each of the SIS at the NPP<br>g) potential failure modes of the SIS at the NPP<br>h) methods used to determine the potential failure modes of the SIS at the NPP<br>i) reliability assessments, inspections, monitoring, testing, verifications, and recording and reporting activities that the | | |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | licensee will carry out to assure, verify, demonstrate or document that the reliability program is implemented correctly and effectively in accordance with regulatory requirements<br>j) the results of the reliability assessments, inspections, monitoring, testing, verifications, and reporting activities that the licensee carried out as part of the reliability program | | |
| 12 | OPGN | Section 2.2 | - Clarification should be provided on whether a *failure sequence* is intended to mean an initiating event.<br>- Item 1a) is interpreted to include failure of process systems. | It is suggested to add this definition to the Glossary. | A failure sequence is synonymous with an accident sequence. There is no need to add the definition of either failure sequence or accident sequence to the glossary. |
| 13 | Bruce Power, OPGN | Section 2.2, Item 1.b) | There is no need to rank identified SIS as all SIS are considered important to safety and are given the same treatment. | Please clarify | SIS ranking was clarified in Section 3.1.2, to specify that ranking should be performed according to accepted probabilistic importance measures. |
| 14 | NBPN, OPGN | Section 2.2.1(a) and Section 3.1.1 | It is inferred that the identification of SIS is performed on the basis of identifying SSC associated to initiating events, which is incorrect. | As part of the PSA and the reliability program, occurrence of Initiating Events are monitored however the systems and components which are the cause of those initiating events are not necessarily included in the PSA model and the reliability monitoring program. SIS and system functions SSCs modeled in the PSA are related to the prevention, detection and mitigation of initiating events. | The statement in RD/GD-98 is correct in general.<br>When fault trees are developed to calculate the initiating event (IE) frequency, SSCs that are the cause of the IE are identified. No change is required. |
| 15 | OPG | Section 3.0 | An NPP's reliability program should possess the following elements to accomplish its objective of enhancing | 1) The reference to INPO AP-913 suggests that the CNSC would like to significantly expand the role of the | 1) It is not the intent of CNSC to expand the role of S-98. The reference to INPO and IEEE is just for listing the |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | plant availability and safety:<br>• performance monitoring<br>• performance evaluation<br>• problem prioritization<br>• problem analysis and corrective action recommendation<br>• corrective action implementation and feedback<br><br>These elements are also shown in the equipment reliability process top-level diagram provided in INPO AP-913, *Equipment Reliability Process Description* (Revision 1), a document issued by the Institute of Nuclear Power Operations. The reliability of the SIS should be considered for different power levels and during start-up and shutdown of the reactor. The impact of the post-accident mission time should be considered for all aspects of the reliability program.<br><br>The effort and resources allocated to the reliability program for each of the SIS should be commensurate with the importance of the system to the safe operation of the NPP. | reliability program traditionally described by S-98 and reported in S-99 without giving sufficient thought to how this will be implemented in industry. The discussion in RD/GD-98 is out of step with the expectations in S-99.<br><br>2) The relationship between RD/GD-98 expectations and an AP-913 program is not clear.<br><br>3) The following statement **"***<u>The reliability of the SIS should be considered for different power levels and during start-up and shutdown of the reactor</u>"* represents a new requirement. Presently the list of S-98 systems has been derived from the PRA "At-power" model. CNSC needs to provide further direction.<br><br>4) The following statement: "*<u>The effort and resources allocated to the reliability program for each of the SIS should be commensurate with the importance of the system to the safe operation of the NPP</u>*" is too generic and beyond the scope of the Risk and Reliability program.<br><br>5) SB: The impact of post-accident mission time and mission failures should be part of a separate mission testing program. This should be clarified. | Reliability Program Attributes and elements as reported in Requirement 9 (a) of Section 2.2.<br><br>2) Same as above.<br><br>3) Wording was changed as follows: *"The reliability of the SIS should be considered at power and shutdown states of the reactor*". For those systems identified for the shutdown state, the Licensee should provide assurance that these systems are monitored in such a way to ensure they are available upon demand, therefore, there will be no need to develop reliability target and models as per RD/GD-98.<br><br>4) The sentence has been removed.<br><br>5) Consideration Mission time is addressed in Section 3.6.2, 9th bullet. |
| 16 | OPGN | Section 3.0 | The reference to INPO AP-913 suggests that the CNSC would like to significantly expand the role of the reliability program traditionally described by S-98 and reported in S-99 without giving sufficient thought to how this will be implemented in | 1) Please clarify the relationship between RD/GD-98 expectations and an AP-913 program.<br><br>2) Please clarify that the impact of post-accident mission time and mission failures is | 1) It is not the intent of CNSC to expand the role of S-98. The reference to INPO and IEEE is just for listing the Reliability Program Attributes and elements as reported in Requirement |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | industry. The discussion in RD/GD-98 is out of step with the expectations in S-99. The relationship between RD/GD-98 expectations and an AP-913 program is not clear.<br><br>The following statement "The reliability of the SIS should be considered for different power levels and during start-up and shutdown of the reactor" represents a new requirement. Presently the list of S-98 systems has been derived from the PRA "At-power" model. CNSC needs to provide further direction.<br><br>The following statement: "The effort and resources allocated to the reliability program for each of the SIS should be commensurate with the importance of the system to the safe operation of the NPP" is too generic and beyond the scope of the Risk and Reliability program.<br><br>The impact of post-accident mission time should be considered for all aspects of the reliability program. | to be part of a separate mission testing program. | 9 (a) of Section 2.2.<br>2) Consideration Mission time is addressed in Section 3.6.2, 9th bullet. |
| 17 | Bruce Power | Section 3 – last paragraph | All SIS are considered important to safety and are given the same importance. | See Section 2.2 comment above. | SIS ranking was clarified in Section 3.1.2, to specify that ranking should be performed according to accepted probabilistic importance measures. |
| 18 | Hydro-Quebec | Section 3 *(F)* | La fiabilité des SIS doit être considérée pour les différents niveaux de puissance ainsi que durant les phases de démarrage et d'arrêt du réacteur.<br><br>Il n'est pas raisonnable de demander de développer les modèles pour plusieurs | Supprimer la phrase | La phrase a été modifiée comme suit: `La fiabilité des SIS doit être considérée durant les modes de fonctionnement à pleine puissance et à l'arrêt. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | états transitoires qui durent peu de temps. | | |
| 19 | Hydro-Quebec | Section 3 (E) | It is not reasonable requesting to develop models for transition states which have a short duration | Delete the sentence. | The document does not call for the development of models for transition states.<br>For clarification, wording was changed as follows: *"The reliability of the SIS should be considered at power and shutdown states of the reactor*". |
| 20 | Hydro-Quebec | Section 3 (F) | Ces éléments sont également présentés dans le diagramme de haut niveau illustrant le processus de fiabilité des équipements, dans le document de l'Institute of Nuclear Power Operations, INPO AP-913, *Equipment Reliability Process Description (Revision 1)*.<br><br>Cette phrase ne permet pas de préciser ni les attentes, ni les exigences de la CCSN. En y faisant référence le document introduit de la confusion entre la portée de l'AP-913 et les obligations réglementaires des titulaires de permis | Retirer cette phrase. | La référence à INPO-AP-913 consiste uniquement à énumérer les attributs (éléments) du programme de fiabilité, comme déjà mentionné dans la Section 2.2, 9 (a) |
| 21 | OPG | Section 3.1.1 | NPP licensees should identify and document all SIS associated with the initiation, prevention, detection or mitigation of any failure sequence that could lead to damage of fuel, associated release of radionuclide, or both. SIS should be identified using a systematic approach. The probabilistic safety assessment (PSA) is the most thorough and systematic method to do so, and includes the insights from a Level-2 PSA, shutdown PSA, and external events and hazards assessments. However, other principles and information – such as defence-in-depth, results of deterministic safety analysis, operating experience and expert judgment – should also be | 1) The term *Safety function* should be defined.<br>2) Process systems have a significant role to play in maintaining plant safety. This discussion is focused on ability to respond to an initiating event. | 1) Agreed. A definition for "safety function" has been added to the Glossary.<br>2) The CNSC agrees that process systems have a significant role in maintaining the plant safety. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | considered when identifying SIS.<br>The criteria for determining SIS are based on:<br>• safety function(s) to be performed<br>• consequence of failure<br>• probability that the SSCs will be called upon to perform the safety function<br>• the length of time between a postulated initiating event and the point when the SSCs will be called upon to operate, and the expected duration of that operation<br><br>The list of SIS may be revised in light of emerging operational data, system changes, new failure data, or when other new information is provided. The basis for revision must be fully documented. | | |
| 22 | Bruce Power | Section 3.1.1, 1st paragraph | *"…all SIS associated with the initiation, prevention, detection or mitigation of any failure sequence that could lead to damage of fuel, associated release of radionuclide, or both…"*<br>Is a redundant statement. SIS are defined in Section 2.2, 3.1.1, the glossary and technically in Section 3.1.2.1. Repeating the definition implies that there is a subset of the SIS, or that they require some further interpretation. The regulatory document should define SIS once, clearly. | Remove the redundant text. | Agreed. The 1st paragraph of Section 3.1.1 has been removed. |
| 23 | Bruce Power | Section 3.1.1, 2nd paragraph | Characteristics of a modern PRA are given here and they loosely reflect the requirements of S-294, why not just reference the standard? This would preclude revision in the event that S-294 requirements change. | Remove the description of PSA and just refer to S-294 compliant PRA. Compliance with S-294 is required, and supersedes the descriptive collection of PRA attributes. | Agreed. Reference to S-294 has been added. |

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|---|---|---|---|---|---|
| 24 | Bruce Power | Section 3.1.1, criteria bullets | The criteria for identifying SIS are given explicitly in 3.1.2.1 why not keep the discussion there? What is added by these bullets? | Remove the discussion on the basis for criteria. | This section has been revised to take into account the questions raised about the ranking. |
| 25 | Hydro-Quebec | Section 3.1.1 (F) | Cela comprend les résultats de l'EPS de niveau 2, de l'EPS pour la phase d'arrêt ainsi que les résultats des évaluations des risques et des événements. Externes.<br><br>Erreur de frappe | Cela comprend les résultats de l'EPS de niveau 2, de l'EPS pour la phase d'arrêt ainsi que les résultats des évaluations des risques et des événements externes. | D'accord. Le changement a été apporté. |
| 26 | OPG | Section 3.1.2 | Systems identified as important to safety should be ranked on the basis of their relative importance to safety and according to their contribution to the overall plant risk (risk of severe core damage and risk of associated radioactive releases).<br>This ranking should be performed using the results of a plant-specific PSA. However, in the absence of a PSA, engineering judgment may be used. The criteria used to rank the systems should be properly documented. | 1) Guidance should be provided on the rationale for and the expected use for system ranking.<br>2) Ranking implies ordering of all SSCs based on their importance to safety however the intent of the section seems to be to identify those SSCs that meet the threshold to be classified as SIS. | SIS ranking was clarified in Section 3.1.2, to specify that ranking should be performed according to accepted probabilistic importance measures. |
| 27 | Hydro-Quebec | Section 3.1.2 (F) | Les systèmes jugés importants pour la sûreté doivent être classés selon leur importance relative pour la sûreté et leur contribution au risque global de la centrale (risque de dommages graves au coeur et risques de rejets radioactifs associés).<br><br>Du point de vue de suivi opérationnel et la maintenance, tous les SIS ont la même importance. Trop de règles de suivi rendent la gestion très compliquée voire impossible. En mettant tous les SIS également importants, l'orientation devient conservatrice. Ceci est conforme au document AP-913 où les systèmes sont classés critiques pour la sûreté. | Le classement des systèmes ne doit pas être obligatoire si l'approche ci-décrite est utilisée. | Des précisions sur le classement des SIS ont été apportées à la section 3.1.2 pour indiquer que celui-ci devrait être établi en fonction de mesures d'importance probabilistes acceptées. |

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| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| 28 | Hydro-Quebec | Section 3.1.2 (E) | Systems identified as important to safety should be ranked on the basis of their relative importance to safety and according to their contribution to the overall plant risk (risk of severe core damage and risk of associated radioactive releases).<br><br>For an operational monitoring and maintenance planning, all the SIS should have the same level of importance. Too much rules complicates the management and overall efficiency. Putting all the SIS at the same level of importance is an conservative approach. It goes along with the AP-913 document defines a category for safety critical systems. | Ranking of SIS SSC should not be mandatory if the described approach is used. | SIS ranking was clarified in Section 3.1.2, to specify that ranking should be performed according to accepted probabilistic importance measures. |
| 29 | Bruce Power | Section 3.1.2.1, second last bullet | Is this an implicit requirement that the SIS list be updated every 3 years with the revision of the PRA as per S-294? | Please clarify. | Correct. The list of SIS should be updated as necessary at every PSA update. |
| 30 | Bruce Power | Section 3.1.2.1, last bullet | The statement here is already enveloped in the third last bullet. | Remove the last bullet. | The third last bullet addresses the gap between the existing PSA and S-294 and about the means for compensating, whereas the last bullet specifies the need to use the insights from PSA level 2, shutdown and external events. No change is required. |
| 31 | NBPN | Section 3.1.2.1, last bullet | States that insight from level-2 PSA (small and large release)… | Should be considered when identifying SIS. While this is a requirement of RD-337 for new builds, there is no requirement for existing plants to calculate small release as a risk metric. This should be reflected in the guide. | Agreed, it is not a requirement. However if the small release is calculated, then the insights should be considered. |
| 32 | OPG, OPGN | Section 3.1.2.1 | The following importance measures are used as criteria to assess the relative contribution of systems to plant risk:<br>• risk-increase ratio, also called risk | 1) This section provides guidance for identifying SIS but does not provide any guidance on ranking either how to rank or why to rank. | 1) SIS ranking was clarified in Section 3.1.2, to specify that ranking should be performed according to accepted probabilistic importance measures. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | achievement worth (RAW)<br>• Fussell-Vesely (FV) importance<br>The following points provide criteria and guidance for identifying SIS:<br>• Any system with FV ≥ 0.05 (or component FV ≥ 0.005) and RAW ≥ 2 should be considered important to safety.<br>• If a system has FV ≥ 0.05 (or component FV ≥ 0.005) or RAW ≥ 2, detailed justification should be provided if it is excluded from the list of systems important to safety<br>• Consideration should be given to those components identified as important to safety by the component screening criteria, and for which the associated system is screened out by the system-level screening criteria.<br>• Expert panels can be used to complement the PSA review group for consideration of the deterministic safety analysis and defence-in-depth principles. The rationale for the expert panel's decision to add or remove any system in the list of identified SIS should be fully documented.<br>• Insights from existing PSAs should be used to the extent practicable for the purpose of determining SIS, with consideration given to the quality, scope and limitations of the PSA. The gap between the existing PSA scope and quality, and the requirements in CNSC Regulatory Document S-294, *Probabilistic Safety Assessment (PSA) for* | 2) Suggest that all references to ranking systems be replaced by classifying systems as SIS.<br><br>3) No guidance is provided on how to integrate input from Level 1 and Level 2 PSAs, from at power and outage PSAs and hazard assessments.<br><br>4) Not clear what "to the extent practicable" means in this context. | 2) Guidance is given in s. 3.1.2.<br><br>3) This should follow the same principles as for the Level 1 PSA, internal events at power.<br><br>4) "Extent practicable" has been removed. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | *Nuclear Power Plants*, should be compensated for by other means/considerations to be factored into the determination of the list of SIS.<br>• The list of SIS should be updated with consideration given to the PSA revisions, updates and improvements aimed at the requirements listed in S-294.<br>The insights from Level-2 PSA (small and large release), the shutdown PSA, and external events and hazards assessment should be considered when identifying SIS. | | |
| 33 | Bruce Power | Section 3.1.2.2 | Do any Canadian Licensee's still not have a PRA? Does this clause have relevance anymore? Presumably any new build development would have to have at least a preliminary PRA in the design stage. | Remove this section if it no longer reflects the status of PRA in the industry. | Agreed. Section 3.1.2.2 has been removed. |
| 34 | OPG | Section 3.1.2.2 | If a plant does not have a PSA, then the identification of SIS starts by identifying all systems associated with the initiation, prevention, detection or mitigation of any failure sequence that could lead to fuel damage, associated release of radionuclide or both. The identification process will be completed by reviewing the primary list of systems; this review is to identify only those systems that contribute significantly to plant safety, based on their importance to safety functions. | | Agreed. Section 3.1.2.2 has been removed. |
| 35 | Bruce Power | Section 3.1.3 | Could the basis for selection criteria given in Section 3.1.1 also be used as a basis for screening out in the right context? (i.e., probability that the SSCs will be called upon to perform the safety function, or, the length of time between a postulated initiating event and the point | If the bullets in 3.1.1 remain in the document, clarify whether they can be used as a basis for the screening out of systems as well. | The basis for screening out is given by 2nd bullet of Section 3.1.4 |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | when the SSCs will be called upon to operate, and the expected duration of that operation) | | |
| 36 | OPG | Section 3.1.3 | SSCs that do not contribute to plant safety may be screened out of the reliability program. If the licensee declares that specific SSCs are unimportant to safety, the rationale for this should be fully documented. | What is the intent of this section? | The basis for screening out is given by 2nd bullet of Section 3.1.4 |
| 37 | Hydro-Quebec | Section 3.1.3 (F) | Les SSC qui ne contribuent pas à la sûreté de la centrale peuvent être exclus du programme de fiabilité. Un titulaire de permis qui déclare ces systèmes non importants pour la sûreté doit justifier entièrement sa décision.<br><br>Si l'identification des SIS se base sur les critères « d'inclusion », il n'est pas requis de fournir la justification de l'exclusion des systèmes qui ne sont pas SIS. Le fait que ces systèmes ne rencontrent les critères d'inclusion dans la liste des SIS est la justification suffisante. | Ajouter le texte suivant dans la section :<br><br>« Si l'identification des SIS se base sur les critères « d'inclusion », il n'est pas requis de fournir la justification de l'exclusion des systèmes qui ne sont pas SIS. » | La définition du Classement a été ajoutée au document. Le critère ainsi que les conditions d'exclusion est donné dans le deuxième tiret de la Section 3.1.4 |
| 38 | Hydro-Quebec, OPGN | Section 3.1.3 (E) | SSCs that do not contribute to plant safety may be screened out of the reliability program. If the licensee declares that specific SSCs are unimportant to safety, the rationale for this should be fully documented.<br><br>If the SIS identification is based on the inclusion criteria, it is not necessary to provide the rationale for the exclusion of systems which are not SIS.<br>Given that these systems does not meet the inclusion criteria provides a sufficient rationale. | Add the following text in the section:<br><br>"If the SIS identification is based on the inclusion criteria, it is not necessary to provide the rationale for the exclusion of systems which are not SIS." | The basis for screening out is given by 2nd bullet of Section 3.1.4. |
| 39 | NBPN | Section 3.2 | It is stated that the selection of reliability targets for a Special Safety System should be set no lower than 0.999. As | In addition to the licensing target for each Special Safety System, for which PLGS will continue to strive to maintain the licensing | Comment noted.<br><br>As for the reliability targets, section 3.2 |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | well, for all other poised SIS the target should be set at lower than 120% of the baseline. | target for SDS1, SDS2, ECC and Containment as quantified from representative tops within the PSA, some sub-functions of ECC however, such as loop isolation sub-function or the PHT Crash Cool-down sub-function require reliability targets that can be calculated from the respective contribution of those sub-functions towards the SCDF and LRF at the plant level. As well, calculated targets provided for other SIS are suggested to be used as lower tier indicators in an effort to monitor the erosion of the margins to the safety goals that is SCDF and LRF at the plant level. All targets should emanate from the respective contribution of those functions towards the safety goals and should be inherently correlated from that perspective by the PSA. Furthermore, these targets should not be subject to a maximum value of 120%. The target allocation process should allow for the Predicted Future Unavailability of all system representative tops to be at their respective target values without exceeding any of the safety goals established for SCDF and LRF at the plant level. | has been changed to *"the target should be set at or lower than 120% of the baseline performance."*<br>Section 3.2 states that reliability targets should be consistent with the safety goals. |
| 40 | Bruce Power | Section 3.2, 1st Paragraph. | *"where no safety goals exist…."*…which licensee is not governed by safety goals? | Remove this statement. | Agreed. Sentence fragment has been removed. |

**Comments Report – Public Consultation**
**Draft Guidance Document: RD/GD-98, *Reliability Programs for Nuclear Power Plants***
Public consultation: January 9 – February 23, 2012;

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| 41 | NBPN | Section 3.2, 1st Paragraph | The first paragraph states that the reliability targets that: the *licensee assigns to SIS should be consistent with the NPP's safety goals…*<br>and then further states that: *The following principles apply:*<br>• *For all other poised SIS, the target should be set at lower than 120% of the baseline performance of the system.* | However, simply setting a target of 120% of the baseline value for all other poised systems does not inherently demonstrate that the NPP's safety goals will be met, and does not recognize that depending on design of specific facilities that such an approach may not permit achieving the NPP safety goals. Further action by the licensee is required to demonstrate that all systems being assigned a value of 120% of baseline will actually achieve the safety goals. If it is judged, or determined, that meeting 120% of baseline will not achieve the NPP safety goals, then an alternative method must be applied. As a result, it is suggested to add the following wording to the guide after the bullet identified above.<br>*The following principles apply:*<br>• *For all other poised SIS, the target should be set at values that are consistent with the overall risk of the NPP, established by the PSA.*<br>• *The licensees should demonstrate that the NPP safety goals are achieved with the set of allocated SIS target reliability values.*<br>• *If it is judged or demonstrated that NPP safety goals cannot be achieved, targets should be adjusted in accordance with a methodology accepted by person(s) authorized by the CNSC.* | Comment noted.<br>As for the reliability targets, section 3.2 has been changed to "the target should be set at or lower than 120% of the baseline performance."<br>Section 3.2 states that reliability targets should be consistent with the safety goals. |

**Comments Report – Public Consultation**
**Draft Guidance Document: RD/GD-98, *Reliability Programs for Nuclear Power Plants***
Public consultation: January 9 – February 23, 2012;

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| 42 | OPGN | Section 3.2 | 1) The guidance for target setting applies only to poised systems. No guidance is provided for setting targets for process systems that have been identified as impacting risk (e.g. LPSW at Darlington.)<br>2) 2nd last paragraph: This seems to be the reverse of the position the CNSC had previously. Targets should be revised for significant system/model changes but not every time operational data is updated.<br>3) The discussion of IEEE and IAEA docs provides no added value. These (highlighted) sections should be removed. | 1) Suggest change to **"at or lower than 120% of baseline."**<br>2) Please clarify the conditions for which system targets can/should be revised.<br>3) References to IEEE and IAEA documents should be removed. | 1) As for the reliability targets, section 3.2 has been changed to "the target should be set at or lower than 120% of the baseline performance."<br>2) Wording is changed to: "Reliability targets should be revised following system design or model changes. The basis for revision must be fully documented".<br>3) No change. These are references to international best practices. |
| 43 | OPG | Section 3.2 | The objective of setting reliability targets for SIS is to establish a reference point against which to judge system performance. The reliability targets that the licensee assigns to SIS should be consistent with the NPP's safety goals and should consider industry-wide operating experience where practicable. Where no safety goals are in place, reliability targets should be based on good engineering judgment, accounting for dependencies between systems. A single system may be assigned multiple reliability targets, depending on different failure criteria.<br>The licensee should monitor the performance or condition of SIS against licensee-established targets, as a way to reasonably ensure that the SIS are capable of fulfilling their intended functions. When the performance or condition of any structure, system or component fails to meet established targets, appropriate corrective action | 1) The guidance for target setting applies only to poised systems. No guidance is provided for setting targets for process systems that have been identified as impacting risk (e.g. LPSW at Darlington.)<br>2) Current OPG governance specifies targets to be set at or lower than 120% of baseline. Suggest change to **"at or lower than 120% of baseline."**<br>3) Some stations will be unable to comply with the requirement to have the "Reliability targets for special safety systems set no lower than 0.999. This is consistent with established CNSC limits". SB: Agree with this. Pickering A already has SSS established licensing limits agreed to by CNSC. This part contradicts these limits.<br>4) SB: Targets should be "**set at or lower than 120%**". | 1) It is CNSC`s view that the running process systems are counted as contributing to the initiating event frequency and the mitigation function of the process systems is poised.<br>2) Section 3.2 has been changed to "the target should be set at or lower than 120% of the baseline performance."<br>3) If licensing limits are already established, then the licensee will continue referring to these limits.<br>4) Section 3.2 has been changed to "the target should be set at or lower than 120% of the baseline performance."<br>5) Wording is changed to: "Reliability targets should be revised following system design or model changes. The basis for revision must be fully documented".<br>6) These references provide international best practices as |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | should be taken.<br>Reliability targets may be developed during the initial phase of reliability programs. These targets are intended to be compared with actual plant performance, in order to identify deviations from expected performance. The *IEEE Guide for General Principles of Reliability Analysis of Nuclear Power Generating Station Safety Systems* issued by the Institute of Electrical and Electronics Engineers gives the basis for establishing these numerical targets, which are based on the following:<br>• frequency of demand<br>• consequence of failure<br>• risk<br><br>The International Atomic Energy Agency's IAEA TECDOC-524, *Status, Experience and Future Prospects for the Development of Probabilistic Safety Criteria*, provides the principles for deriving numerical objectives.<br><br>The selection of reliability targets should maintain a balance between the prevention and mitigation of events. The following principles apply:<br>• Reliability targets for special safety systems should be set no lower than 0.999. This is consistent with established CNSC limits.<br>• For all other poised SIS, the target should be set at lower than 120% of the baseline performance of the system.<br><br>Reliability targets should be revised in | 5) 2nd last paragraph: This seems to be the reverse of the position the CNSC had previously. Targets should be revised for significant system/model changes but not every time operational data is updated.<br><br>6) The discussion of IEEE and IAEA docs provides no added value. These (highlighted) sections should be removed. | additional information for users of this document. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | light of emerging operational data, system changes or new failure data, or when other new information is provided. The basis for revision must be fully documented.<br><br>Appropriate corrective action should be taken whenever the performance or condition of a system important to safety does not meet established goals. | | |
| 44 | Hydro-Quebec | Section 3.2 (F) | Établissement des objectifs de fiabilité<br>Les mesures correctives appropriées doivent être prises chaque fois qu'un SIS n'atteint pas les objectifs fixés.<br><br>Cette exigence de définir et réaliser les mesures correctives automatiquement lorsque l'objectif de fiabilité d'un SIS n'est pas respecté n'est pas requise. Une analyse doit être réalisée et lorsque les objectifs de sûreté et la robustesse de la défense en profondeur sont assurés, l'action corrective immédiate n'est pas nécessaire. Cependant, le suivi plus strict de ce SIS peut être envisagée | Ajouter le texte suivant à la fin de section : « Cette mesure corrective peut aussi comprendre une analyse détaillé de la situation. Si cette analyse démontre que les objectifs de sûreté et la défense en profondeur sont assurés, ce SIS doit être surveillé plus étroitement. » | D'accord. Le paragraphe suivant a été ajouté.<br><br>"Une telle mesure peut comprendre une analyse détaillée de la situation. Si cette analyse démontre que les objectifs de sûreté et les principes de défense en profondeur sont respectés, une mesure corrective immédiate pourrait ne pas être nécessaire et le SIS doit être l'objet d'une surveillance plus étroite. |
| 45 | Hydro-Quebec, OPGN | Section 3.2. (E) | Specifying reliability targets<br>Appropriate corrective action should be taken whenever the performance or condition of a system important to safety does not meet established goals.<br><br>This requirement for define and perform automatically a corrective action whenever a SIS does not meet established goals is not necessary. Meanwhile, a technical analysis should be performed in order to make sure that the safety objectives and defence in depth are ensured. If it is the case, no immediate corrective action is required, but this SIS | Add the following text at the end of the section:<br><br>"Such a corrective measure can also involve a detailed technical analysis. In the case the analysis demonstrate that the safety objectives and defence in depth are ensured no immediate corrective action may be needed. However, this SIS should be monitored more closely." | Agree. Paragraph has been added. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | should be more closely monitored. | | |
| 46 | OPG | Section 3.3 | The potential failure modes of SIS should be identified, in order to determine necessary maintenance activities and ensure reliable system operation.<br>Failure modes include failure to start on demand, and failure to run for a given mission time. Failure modes can be identified from failure history or through the use of qualitative analytical methods, if the failure history is not available.<br>Any new identified failure mode should be incorporated into the reliability models. | 1) Includes failure to start on demand and failure to run for mission time.<br><br>2) Models do not currently include mission failures further clarification is required around expectations for tracking mission failures.<br><br>3) Note that Section 3.6.2 states that mission failures can be tracked against mission testing programs.<br><br>4) Discussion of the maintenance program is beyond the scope of this document and should be removed. | 1) This section only describes the different failure modes for information. It does not require that these failure modes be included in the model. No change.<br><br>2) Agreed, models do not include the mission failures. A template is given in RD-99.1. There is no change required to the document.<br><br>3) Agreed, models do not include the mission failures. A template is given in RD-99.1. There is no change required to the document.<br><br>4) Comment noted. Requirement 5 of Section 2 requires providing information for the maintenance program, and the failure mode is important information for the maintenance program. |
| 47 | OPGN | Section 3.3 | 1) Includes failure to start on demand and failure to run for mission time.<br><br>2) Models do not currently include mission failures further clarification is required around expectations for tracking mission failures.<br><br>3) Note that Section 3.6.2 states that mission failures can be tracked against mission testing programs.<br><br>4) Discussion of the maintenance program is beyond the scope of this document and should be removed. | Please clarify that mission failures are to be tracked through the mission testing program. | 1) This section only describes the different failure modes<br><br>2) It is agreed that mission failures will not be included in the models<br><br>3) For example Class III power systems and emergency or qualified power system that include the failures to start (in failures per demand) and failures to run (in failures per hour) for each generator.<br><br>4) Comment noted. Requirement 5 of Section 2 requires providing information for the maintenance program, and the failure mode is important information for the maintenance program. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| 48 | Bruce Power | Section 3.4 – first paragraph, last sentence. | The capabilities and performance levels may be better expressed implicitly rather than explicit physical terms. For example, flow from 2 out of 3 pumps. Each pump will have a design flow characteristic associated with it rather than a single flow value. | Please clarify. | Implicit expression of the capabilities and performance levels is also acceptable. |
| 49 | OPG | Section 3.4 | For each success criterion of a system important to safety, the minimum capabilities and performance levels should be defined. These capabilities and performance levels should be expressed in physical terms (e.g., pressure, flow, voltage, intensity).<br>A given system important to safety can present several failure modes (or success criteria), according to the sequence of events where it is needed. For each of these sequences, the success criteria for the system must be defined.<br>Failure criteria for a system important to safety should be stated in terms of the system **not** performing its function when required to do so. The failure criteria should be explicitly described or referenced in the reliability program document, and they should be consistent with the definition of system failure criteria used in other analyses and/or other documents that support the operating licence. SIS may have several different failure criteria, depending on the plant state, accident condition or consequences of the failure.<br>It is advocated to use the minimum allowable performance standards for the models required by this document (RD/GD-98), given that the conservative deterministic assumptions are in line with this document's scope and intent for | 1) Definition of performance capabilities is beyond the scope of a reliability program. Performance standards are defined outside of the reliability program by subject matter experts.<br><br>2) This section should be revised to indicate that the reliability program will accept as input, the performance specifications defined in other programs and documents. The third paragraph should be revised as follows:<br><br>*Failure criteria for a system important to safety should be stated in terms of the system **not** performing its function when required to do so. The failure criteria should be consistent with the definition of system failure criteria used in other analyses and/or other documents that support the operating licence. SIS may have several different failure criteria, depending on the plant state, accident condition or consequences of the failure.*<br><br>3) Define the "*minimum allowable performance standards*".<br><br>4) Provide clarification around expectations associated with the term *"advocated."* | 1) Wording will be changed to "For each success criterion of a system important to safety, the minimum capabilities and performance levels should be **stated"**<br><br>2) Agree. Change is made.<br><br>3) Definition of Minimum Allowable Performance Standards (MAPS) was added to the glossary.<br><br>4) "Advocated" has been replaced by "accepted". |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | defence-in-depth and design for reliability. It is also acceptable to use realistic assumptions from PSA models. | | |
| 50 | Hydro-Quebec | Section 3.4 (F) | Cette exigence est en lien étroit avec le programme de l'Enveloppe d'exploitation sûre (EES) de la centrale. Cependant, ce programme n'est pas mentionné dans ce document. | Introduire le lien entre cette exigence et le programme de l'EES de la centrale | Le lien est implicitement inclus dans le 3eme paragraphe, étant donné que l'EES fait partie des documents qui supporte la licence d'exploitation. |
| 51 | Hydro-Quebec, OPGN | Section 3.4 (E) | This requirement is closely linked to the Safe Operating Envelope (SOE) program at the plant. Meanwhile, this document does no connexion to this program. | Introduce the link between this requirement and the SOE program at the plant. | The link is stated implicitly in paragraph 3 which states: "The failure criteria should be consistent with the definition of system failure criteria used in other analyses and/or other documents that support the operating licence". SOE is one of the document that supports the licensing basis. |
| 52 | NBPN | Section 3.5. Last Paragraph | States 'This information is fed back into the maintenance program to improve its effectiveness', which is not consistent with the language in the rest of the guide portion. | Suggested wording is 'This information *should be* fed back into the maintenance program to improve its effectiveness' | Agreed. Change made. |
| 53 | OPG | Section 3.5 | The primary objective of a maintenance program is to maintain the plant equipment and systems in accordance with applicable regulations, codes and standards (including CNSC Regulatory Document S-210, *Maintenance Programs for Nuclear Power Plants*), vendor recommendations and previous experience, so that their performance meets reliability targets.<br>Preventive maintenance and consistent corrective maintenance may lead to improvements in failure trends. Reliability-centered maintenance is one technique that uses reliability principles to improve maintenance.<br>The modelling of the probability of failure of SIS includes information from the | 1) Defining the objective and requirements of the maintenance program is beyond the scope of this document.<br><br>2) This section should be revised as follows:<br><br>"The primary objective of a maintenance program is to maintain the plant equipment and systems in accordance with applicable regulations, codes and standards (including CNSC Regulatory Document S-210, *Maintenance Programs for Nuclear Power Plants*), vendor recommendations and previous experience, so that their performance meets reliability targets. | 1) Agree that the definition is beyond the scope of this document. However, this is a short description of the general objective of the maintenance program and reference is made to S-210.<br><br>2) Agree. A new paragraph was added. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | maintenance program. The maintenance program should also include all activities (such as surveillance) that are credited in the reliability models. As mentioned in section 3.3, the identification of the failure mode will determine maintenance activities.<br>Modification of the maintenance program could be recommended if the results of the reliability assessment show that the system is not meeting its target.<br>The reliability modelling of SIS provides information on how the maintenance program affects system reliability. This information is fed back into the maintenance program to improve its effectiveness. | The reliability modelling of SIS provides information on how the maintenance program affects system reliability. Modification of the maintenance program could be recommended if the results of the reliability assessment show that the system is not meeting its target. " | |
| 54 | NBPN | Section 3.6.1, Last Paragraph | There is no justification for a grace period of 25% of the test interval. The objective of a grace period is to ensure that, on average, that the actual average frequency of testing is consistent with claims made in reliability models. That objective can still be met with a longer grace period provided that that the next performance of the test is performed at its normal schedule date and not deferred | To meet the objective and to provide operational flexibility to operating plants, it is suggested to restate the guidelines as follows:<br>*A grace period is allowed. This should be set at no more than 50% of the test interval provided that normal scheduling of test performance is not altered, with an upper limit of no more than 1 year for tests with an interval of 2 years or greater. The basis for the grace period and limit(s) on test interval should be documented.* | The following change was made:<br>*A grace period is allowed. This is generally set at 25% of the test interval. The grace period could be set at no more than 50% of the test interval* for tests done at a monthly or greater frequency.*The basis for the grace period and limit(s) on test interval should be documented.* |
| 55 | OPG | Section 3.6.1 | Adequate testing programs for SIS should be in place as specified in S-210.<br>Where feasible, surveillance activities on redundant equipment should not be performed at the same time or using the same personnel. This is to avoid introducing a common-cause failure.<br>Sufficient testing before, during and after plant shutdowns should ensure that the assumptions of fault discovery intervals | 1) A grace period for testing of 25% would be difficult for very frequent tests. Suggest 50% for tests done at a biweekly or greater frequency.<br><br>2) This is significantly different from current practice and could greatly increase the number of deferrals. Work Control should definitely be warned of the three month limit and | 1) The following change was made: *A grace period is allowed. This is generally set at 25% of the test interval. The grace period could be set at no more than 50% of the test interval* for tests done at a monthly or greater frequency.*The basis for the grace period and limit(s) on test interval should be documented.* |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | made in the reliability assessments remain valid at all times.<br>The frequencies, timing and substance of surveillance activities should be revised in light of emerging operational data, plant changes, failure data, or other new information – provided the reliability assessment is revised accordingly and that consistency with reliability targets is maintained.<br>If a test is missed, the following provisions apply:<br>1. A grace period is allowed. This is generally set at 25% of the test interval, with an upper limit of three months (or other time period, with the agreement of the CNSC).<br>2. The procedure used by the licensee to approve deferral of tests should be submitted to the CNSC for acceptance.<br>3. All tests that have been deferred, along with approval references, should be listed in the annual reliability report.<br>4. All records of approval of test deferrals should be available for inspection upon request. | their input should be sought (we do not believe they can meet this requirement which can have far reaching impact with respect to station resources.<br><br>3) What is the basis for submitting for CNSC acceptance the procedure used for deferral of tests? Item 2. should be removed.<br><br>4) Item 3) If the request is to report all deferrals including those that have been re-scheduled before their red dot date, this will increase the size of the ARR report for little purpose. We suggest this should only include "defer to next occurrences". | 2) Text was changed as follows: *"Deferred tests and preventive maintenance should be reported as per the provisions of CNSC Guidance Document GD-99.1 Guide to the Reporting Requirements for Operating Nuclear Power Plants (Appendix B)"*<br><br>3) Item 2 was reworded to remove CNSC acceptance. The rewording is as follows: ``*The procedure used by the licensee to approve deferral of tests should be available to CNSC staff upon request*``<br><br>4) See bullet 2) above |
| 56 | NBPN | Section 3.6.1.1 | A grace period of 25% of the test interval with an upper limit of three months is not achievable under the SAP scheduling system. | PLGS is currently seeking transfer of the scheduling function for Operational Mandatory Tests perform at this time under the Risk & Reliability group to the Work Planning group, using the SAP system. PLGS is presently using a 50% grace period with an upper limit of one year for long interval surveillance activities. | The following change was made:<br>*A grace period is allowed. This is generally set at 25% of the test interval. The grace period could be set at no more than 50% of the test interval* for tests done at a monthly or greater frequency.*The basis for the grace period and limit(s) on test interval should be documented.* |

**Comments Report – Public Consultation**
**Draft Guidance Document: RD/GD-98, *Reliability Programs for Nuclear Power Plants***
Public consultation: January 9 – February 23, 2012;

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| 57 | OPG | Section 3.6.2 | The model used to describe the system should accurately reflect the system's current configuration. The level of detail of the model should be such that dependencies are clearly identified, but also limited to equipment failure modes. (The failure mechanism could be of interest for specific purposes, but should not be included in the models required by this document).<br><br>The model could include human recovery actions (actions to mitigate system failure) if an equipment failure's impact on the failure of the entire system is developing slowly and the equipment failure can be fixed in the meantime.<br><br>The model should include, to the extent practicable:<br>• Every component and structure and their failure modes that could result in dependence between systems important to safety. Any new identified failure mode should be incorporated in the reliability models.<br>• Human errors (such as maintenance errors and non-detection of annunciate conditions) that could occur before the initiating event and that could contribute to failure of the system function.<br>• Maintenance or testing activities that impair component loops or channels while being performed.<br>• Failure data that represents the actual performance of the odeled components as | 1) Define "*to the extent practicable*"<br><br>2) Not all new failure modes need to be incorporated into the reliability models. Provision should be provided for assessment of the failure mode to determine whether it represents a single failure unlikely to be repeated or is in fact representative of expected performance going forward.<br><br>3) Impact of uncertainties is considered in development of the models only. This should be clarified. Provide further clarification for the phrase *"consideration of."*<br><br>4) This section refers to reliability models and on-demand models. The language should be clarified to state that only one model is required per system.<br><br>5) No guidance is given for measuring and monitoring mission testing programs.<br><br>6) SIS reliability models do no currently include support systems. Where appropriate, some components of a support system are included in the SIS model through the definition of component boundaries. Integration of support system performance is done via the risk program and a fully integrated risk model. This bullet should be removed.<br><br>7) Unavailability models are meant to measure the performance of the system itself as opposed to everything else attached to it. Support systems are | 1) "Extent practicable" has been removed.<br><br>2) Agree. Sentence is changed as follows: "*Any new identified failure mode should be incorporated in the reliability models, unless it is shown that it is a single failure that is unlikely to be repeated"*.<br><br>3) "Consideration of the .." means consideration of the uncertainty during the model development as well as when significant changes are made to the mode. This is added to Section 3.6.2.<br><br>4) This question is addressed in 3.6.2, the second last bullet. There is no need for a model with mission time<br><br>5) Mission tests (e.g., EPGs and SGs) should be performed following best industry practice. Reporting requirements are in RD-99.2.<br><br>6) Last bullet was removed.<br><br>7) Agreed. No change necessary to document. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | accurately as possible. Site-specific failure data should be compared to the failure data used in the assessment. Where the information is insufficient, relevant generic failure data may be used to derive valid site-specific data. Generic failure data should preferably be extracted from other operating experience and should closely reflect the actual performance of the component.<br>• Estimation of human performance reliability that considers all conditions, shaping factors and other considerations specific to the plant, according to internationally established techniques for human reliability analysis.<br>• Consideration of the potential impact of uncertainties.<br>• An assessment of the importance, contribution and sensitivity of each component failure to the reliability of the entire system.<br>• On-demand failure, as well as any latent faults that are detectable through testing (for reliability models).<br>• A comparison to the reliability targets (for on-demand models only). The mission failure rate of relevant components should be tracked against mission testing programs.<br>• A support system (for SIS reliability models, and if the support system is exclusively devoted to the operation of | completely and coherently contained in the risk assessments. | |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| | | | systems important to safety). | | |
| 58 | Bruce Power | Section 3.6.2 | This section requires inclusion of support system(s) in the model if the system is exclusively devoted to operation of systems important to safety. Wouldn't the support systems be considered as a SIS in their own right if they met the criteria of 3.1.2.1? | Please clarify. | Last bullet of Section 3.6.2 was removed. |
| 59 | NBPN | Section 3.6.2 | The potential impact of uncertainties is performed as part of the PSA on the overall contribution emanating from Internal, Flood and Fire events combined. Uncertainty analysis is not conducted at the SIS level. Similarly, sensitivity analysis is performed for known assumptions on the overall risk model and not on every component failure at the SIS level. | | "Consideration of the .." means consideration of the uncertainty during the model development as well as when significant changes are made to the mode. This clarification was added to Section 3.6.2. |
| 60 | Bruce Power | Section 3.6.2 – 4th bullet. | The description should be made consistent with the Bayesian approach of generating site-specific failure data. Normally, site-specific data makes use of actual plant failure data combined with prior information (derived from generic data). | Please clarify. | Agreed. Wording was changed accordingly. |
| 61 | Bruce Power | Section 3.6.2 – last bullet. | I believe what is meant is – "Portion of a support system that is exclusively dedicated to the operation of the SIS". | Please clarify. | Last bullet of Section 3.6.2 was removed. |
| 62 | Hydro-Quebec | Section 3.6.2 (F) | Le mécanisme de défaillance pourrait présenter de l'intérêt à des fins spécifiques, mais il ne doit pas être inclus dans les modèles exigés par le présent document, RD/GD-98<br><br>L'évaluation de l'importance, la contribution et la sensibilité de chaque défaillance de composant sur la fiabilité du système en entier. | 1) Clarifier cette exigence.<br><br>2) Changer l'exigence pour : « L'évaluation de l'importance, la contribution et la sensibilité les défaillances critiques. » | 1) La phrase a été changée comme suit : "*Tout nouveau mode de défaillance relevé doit être intégré aux modèles de fiabilité, à moins qu'il soit démontré qu'il s'agit d'une défaillance unique qui ne pourrait se reproduire".*<br><br>2) D'accord. Le changement a été effectué. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | Il n'est pas clair quels sont le but et le sens de cette phrase ?<br><br>Il n'est pas raisonnable d'évaluer l'impact de toutes les défaillances. Ceci est en contradiction avec l'approche graduée où on attribue les ressources aux défaillances critiques selon les mesures de facteur d'importance (par exemple : FV et RAW). | | |
| 63 | Hydro-Quebec, OPG | Section 3.6.2 (E) | The failure mechanism could be of interest for specific purposes, but should not be included in the models required by this document<br><br>An assessment of the importance, contribution and sensitivity of each component failure to the reliability of the entire system.<br><br>It is not clear what are the purpose and the meaning of this sentence?<br><br>It is not reasonable to assess the impact of all the component failures. Such a requirement does not go along with the graded approach where one allocates resources to the most critical failures (determined for example through FV and RAW) | 1) Clarify the requirement.<br><br>2) Change the requirement for: "An assessment of the importance, contribution and sensitivity of the critical failures". | 1) Sentence is changed as follows: "*Any new identified failure mode should be incorporated in the reliability models, unless it is shown that it is a single failure that is unlikely to be repeated*<br><br>2) Agree. Change made. |
| 64 | OPG | Section 3.6.3 | Performance monitoring relies on gathering pertinent failure detection and in-plant reliability information. This includes both reliability monitoring (e.g., observation of failure frequency, outage rate, maintenance durations, outage times) and condition monitoring (e.g., observation of conditions related to failure, | 1) The purpose of this section is not clear. Condition monitoring is beyond the scope of the reliability program and is addressed through other health monitoring programs at site.<br><br>2) This section should be removed or a clear statement provided that the | 1) Condition monitoring is an element of the reliability program which is also part of the maintenance program (S-210). This section gives a brief description of the condition monitoring as per IEE and INPO-913<br><br>2) The health monitoring program that |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | such as degraded performance, and/or changes in equipment parameters as measured by non-destructive tests, such as ultrasonic inspections, electrical continuity tests and acoustic vibration monitoring).<br>The reliability monitoring of SIS involves the review, recording, and trending of the reliability performance or condition of all SIS. This is to ensure they remain capable of meeting their functional specifications and will perform consistently with their specified reliability targets and reliability assessments. The licensee should establish a basis for excluding any specific components identified in the reliability assessments from reliability monitoring. This basis should be related to the limited likelihood or safety impact of component failure modes.<br>If a reliability problem is diagnosed, the reliability program should be capable of determining the cause of the problem and devising corrective actions to rectify it.<br>The reliability program should have the means to monitor the efficacy of corrective actions, so it can ensure the proposed solution is adequate. | condition monitoring programs are not considered part of the reliability program and will not be subject to CNSC review under RD/GD-98.<br><br>3) It is unclear why this requirement in the last paragraph is considered part of the reliability program. The reliability program detects trends in equipment or SIS reliability (reported in the ARR) but "*determining the cause of the problem and devising corrective actions to rectify it"* is part of other processes (e.g. systematic approach to problem solving, etc). | addresses the condition monitoring is already dealt with S-210 and we do not intend to request another review within the scope of S-98.<br>3) "Corrective action implementation and feedback" is also an attribute of the reliability program. |
| 65 | OPG | Section 3.6.3.1 | The reliability performance of all SIS should be monitored to assure that they remain capable of meeting their functional specifications and that they perform consistently with their specified targets.<br>This monitoring process should include:<br>ıtification of incidents when SIS do not ₍et their defined specifications (including ₍iods of scheduled out-of-service and ₍currences of initiating events). An ₍sessment should be made with regard to ₍ severity of the condition and identification | 1) The description of reporting requirements is defined in RD-99.1 and should not be repeated here.<br><br>2) Additional guidance is required with respect to the "*Assessment of the consequences of unsafe component failures" described in the second bullet."* | 1) No change. This section does not describe the reporting requirements.<br>2) The word "unsafe" was deleted in order to remove any confusion. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | he accident sequences affected. These idents are reportable events, in accordance h CNSC Regulatory Document RD-99.1, *porting Requirements for Operating clear Power Plants: Events*.<br>essment of the consequences of unsafe mponent failures, in order to determine the pact on the reliability of the system.<br>sideration of the reliability of SIS during the nning of operational and maintenance ivities. (The reliability monitoring of SIS ould include an assessment of the impact of se activities on reliability performance and nsistency with reliability targets. If a luction in reliability cannot be avoided, the pact on any safety goals of the facility must assessed.) | | |
| 66 | OPGN | Section 3.6.3.1 | essment of the consequences of unsafe mponent failures, in order to determine the pact on the reliability of the system. | The same comment as in Section 3.6.2 | The word "unsafe" was deleted in order to remove any confusion. |
| 67 | Hydro-Quebec | Section 3.6.3.1 (F) | Évaluation des conséquences de toute défaillance de composants pour en déterminer l'impact sur la fiabilité du système.<br><br>Le même commentaire comme dans la section 3.6.2 | | La phrase a été changée comme suit : "*Tout nouveau mode de défaillance relevé doit être intégré aux modèles de fiabilité, à moins qu'il soit démontré qu'il s'agit d'une défaillance unique qui ne pourrait se reproduire"* |
| 68 | Hydro-Quebec | Sectio n 3.6.3.1 (E) | Assessment of the consequences of unsafe component failures, in order to determine the impact on the reliability of the system.<br><br>The same comment as in Section 3.6.2 | | The word "unsafe" was deleted in order to remove any confusion. |
| 69 | NBPN | Section 3.6.3.2 | Although all failures of SIS components are captured and recorded in terms of their specific discovery method, symptom effects, repair and testing strategy, at PLGS, the root cause analysis of the failure itself are not always known. As a | | Comment noted. No change is required. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | result, analysis of component failures to determine if failures were due to non-random causes as well as recording common cause failures cannot always be performed. | | |
| 70 | OPGN | Section 3.6.3.2 | 1. Performance monitoring is beyond the scope of the reliability program and resides with other health monitoring programs at site. This section should be deleted.<br><br>2. The requirement in bullet #4 may contradict with the R-99 reporting requirements. It is unclear why a component failure caused by ageing or wear would be considered a reportable event. This bullet should be deleted. | | 1) Performance monitoring is an element of the reliability program which is also part of the maintenance program (S-210). This section gives a brief description of the performance monitoring as per IEE and INPO-913.<br>2) Agreed, The second sentence on the reporting requirement has been deleted. |
| 71 | Bruce Power | Section 3.6.3.2, 3rd bullet | It's not clear what would constitute a trend that would need to be assessed. | Please clarify. | Please rely on industry best practice. |
| 72 | Bruce Power | Section 3.6.3.2, 4th bullet | The use of 'aging and wear' here is very general. An element of aging and/or wear probably factors into many apparently random failures of equipment. In the extreme, any component failure that takes place after comes into service has 'aged'. I accept that the clause is intended to ensure that 'run to failure' principles are not applied to critical components; however this appears to place a considerably greater reporting requirement on the licensee. | Please clarify. | The second sentence of the paragraph, which is related to the reporting, has been deleted |
| 73 | | Section 3.6.3.2 | The performance or condition of all components of SIS should be monitored. This monitoring of component reliability should include:<br>• Identification of components whose failure decreases the reliability of the system important | 1) Performance monitoring is beyond the scope of the reliability program and resides with other health monitoring programs at site. This section should be deleted.<br><br>2) The requirement in bullet #4 may | 1) Performance monitoring is an element of the reliability program which is also part of the maintenance program (S-210). This section gives a brief description of the performance monitoring as per IEE and INPO-913. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | to safety.<br>• Assessment and recording of every failure of a component that could affect the reliability of the whole system to which it belongs, as soon as practicable after the failure has been discovered.<br>• Analysis of component failures to determine if trends exist. If trends are found, their existence should be explained and their importance assessed in relation to the reliability targets.<br>• Analysis of component failures to determine if failures were due to non-random causes (such as being preventable by maintenance; aging or wear; or a design or installation problem). These failures represent safety problems of a different nature than what was previously reported and are therefore reportable events in accordance with CNSC Regulatory Document RD-99.1, *Reporting Requirements for Operating Nuclear Power Plants: Events.*<br>• Assessment of component failure(s) to ascertain if the cause of the failure(s) may be common to other components. Common-cause failures should be identified and recorded. The International Common-Cause Data Exchange protocol might be used to record the common-cause failure for site-specific failure data. To derive accurate site-specific failure data for SIS, the details of the failure | contradict with the R-99 reporting requirements. It is unclear why a component failure caused by ageing or wear would be considered a reportable event. SB: This bullet should be deleted because it essentially means that any component failure is not acceptable and should be reportable.<br><br>3) SB: Bullets 2 and 3 could potentially be used to request quantification of type 3 faults, an issue that has not been resolved and adds no value to the reliability program. | 2) The second sentence of the paragraph which is related to the reporting has been deleted.<br>3) This will follow the resolution course when the discussion is completed. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | history and in-service records for all relevant components should be recorded. | | |
| 74 | Hydro-Quebec | Section 3.6.3.2 4ième bullet | Le RD-99.1 n'est pas encore publié et sujet à changement. Les sujets ou événements qui doivent être signalés selon les exigences du S-99 ou du RD-99.1 relève de la portée du RD-99.1 | Retirer la référence au RD RD-99.1. | La référence au RD-99.1 a été enlevée. |
| 75 | OPGN | Section 3.6.3.2 4th bullet | RD-99.1 document has not been published yet and is subject to changes. | Remove reference to RD-99.1. | The reference to RD-99.1 has been removed. |
| 76 | Hydro-Quebec | Section 3.6.3.2 5ième bullet | Le terme « défaillance d'origine commune »n'est pas adéquat. | Utiliser le terme « Défaillance de mode commun » | D'accord. Le changement a été effectué. |
| 77 | NBPN | Section 3.6.3.3 | There are two aspects of human performance that is included in reliability assessments;<br>1. Post-accident human actions. HRA utilizing generic data and methodology (ASEP or THERP) that involves diagnosis (of alarms) and execution (initiation of mitigating systems and failure to manipulate devices under stress)<br>2. Pre-accident human actions. Human performance related to manual manipulation of active devices and failing to place them into the proper state (after testing or in error during other in-field activities). | For (1), there is no practicable way or method to monitor actual human performance in terms of diagnosis (of alarms) and execution (initiation of system) relative to performance shaping factors included in HRA ASEP or THERP methodology that is included in the models. For example, we do not perform in-field tests under the same stress conditions, initiating event alarms, etc., to demonstrate holistically that the operator responds appropriately to an accident from onset of the condition until a stable plant state is achieved. The best we can do is utilizing remote simulators to help understand the timing and probability of operator failure to diagnose and execute, which is included in the models. However, there is no way to make such a judgment or comparison for in-field activities that will be meaningful in anyway.<br><br>For (2), this is typically monitored and events recorded through the performance of routinely schedules surveillance and/or | No change. The text implicitly refers to pre-initiators human actions. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | | testing and are often included in models with a specific failure mode for the component that was affected.<br><br>To reflect the above, the following wording change to the first paragraph is suggested:<br><br>Human actions that potentially could impact the reliability of SIS ***when demanded (pre-accident conditions)*** should be identified and monitored…. | |
| 78 | OPG | Section 3.6.3.3 | Human actions that potentially could impact the reliability of SIS should be identified and monitored. The monitoring of human performance should include:<br>• recording of the occurrence of human errors<br>• a comparison of actual site-specific human performance with that used in the reliability assessment | | No change. The text implicitly refers to pre-initiators human actions. |
| 79 | NBPN | Section 3.6.3.3 | Site specific human performance data cannot be capture in a manner which would be comparable to the human error probabilities established within the PSA. However effort can be made to measure the importance of operator actions credited in the PSA as well as the factors influencing the error probabilities associated to the detection and execution parts of those error probabilities. From this information, improvement actions can be design to influence the shaping factors associated to those probabilities resulting in improved operator reliability. | | Comment noted. No change necessary. |
| 80 | OPG | Section 3.6.4 | Reliability assessments evaluate the predicted reliability of SIS, in order to demonstrate their ability to meet their specified reliability targets for all relevant plant states. The methods used to perform | Define "*specific reliability indices*" | Reliability indices are defined in RD-99.1 (section 2.2.2.2.4) and shown in Appendix B.3.1 of GD-99.1 |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | the assessment are at the discretion of the licensee. A system important to safety may require several different reliability assessments to account for different success criteria. All modelled systems should be evaluated quantitatively, in order to derive their predicted reliabilities and to demonstrate they are consistent with their reliability targets. The assessments should reflect the actual operation, surveillance and maintenance activities of the systems as accurately as possible.<br>Reliability assessments should include:<br>• predicted reliability<br>• observed reliability<br>• specific reliability indices | | |
| 81 | Hydro-Quebec, OPGN | Section 3.6.4 | Qu'elle est la différence entre la fiabilité observée et l'indice spécifique de performance de la fiabilité « probabilité de défaillance des SIS en attente » ? | | Les indices de fiabilité sont définis dans la section 2.2.2.2.4 du RD-99.1 et les examples sont donnés dans la section B.3.1 du GD-99.1 |
| 82 | Bruce Power | Sections 3.6.4.1, 3.6.4.3, 3.8 | The requirement to compare predicted and observed reliability, previously and currently, and explain any differences is triplicated in these sections. | Suggest stating the requirement once. | The following paragraph in Section 3.8 has been removed :<br>*The comparison between predicted reliability, reliability performance indices and reliability targets should be reported. Any differences should be explained.* |
| 83 | OPG | Section 3.6.4.1 | The future predicted reliability is assessed using current data, which should be compared to the values obtained for the current and previous years as well as to the target. The reliability assessments should be re-evaluated annually using the latest relevant failure data. Changes in the predicted probability from the value reported in the previous year should be | | No change. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | explained. | | |
| 84 | OPG | Section 3.6.4.2 | Observed reliability is calculated using actual operating performance. | | No change, because this is not a comment. It is just a quotation of the section of RD/GD-98. |
| 85 | Hydro-Quebec | Section 3.6.4.2 | Le document ne précise pas la période de temps d'observation | Préciser que la fiabilité observée est calculé pour l'année civile en cours. | La precision a été ajoutée. |
| 86 | NBPN | Section 3.6.4.3 | Frequency of failure of active systems important to safety should be rephrased to state that the frequency of occurrence from site specific experience as well as used in the PSA be provided for all Initiating Events monitored and considered in the PSA. | | No change. The question of running process systems when counted as contributing to the initiating event frequency was already discussed during the CNSC/COG meeting on July, 22 2010 |
| 87 | NBPN | Section 3.6.4.3, Paragraph 3 | States "Any differences should be explained" between predicted reliability, reliability indices and reliability targets." This constitutes an unreasonable regulatory burden on the licensees since there will always be some differences. If a reliability indices is less than the reliability target, no explanation should be necessary as this is a good thing. We strive for a reliability indices of zero while the target and predicted reliability will always be non-zero. Such differences are expected should not have to be explained. Instead, if reliability indices is greater than predicted or greater than target, then we would agree that those should be evaluated and explained. | Suggest the following wording change:<br><br>The licensee should perform a comparison….***Any occurrences where reliability indices is greater than predicted reliability or greater than target, or where predicted reliability is greater than reliability target, should be evaluated and explained.*** | Agreed. Change made. |
| 88 | OPG | Section 3.6.4.3 | Reliability indices are intended to capture trends in the SIS.<br>The following indices should be reported according to each system's specificity:<br>• the frequency of failure of active systems important to safety<br>• the probability of failure of poised systems important to safety | 1) Further clarification around the reliability indices is required.<br><br>2) SB: "frequency of failure of active systems" needs to be clarified. Does this mean frequency of initiating events? Otherwise it is additional requirement that has not been previously discussed. | 1) Reliability indices are defined in RD-99.1 (section 2.2.2.2.4) and shown in Appendix B.3.1 of GD-99.1<br>2) Yes, this refers to initiating events.<br>3) Comparison with the reliability target is only for poised systems. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | The licensee should perform a comparison between predicted reliability, reliability indices and reliability targets. Any differences should be explained.<br><br>The licensee should establish criteria for determining if an operational event, system change, or acquisition of new knowledge warrants immediate or near-term revision of system reliability models. As a minimum, system and procedural changes, emerging operational data, new system-related knowledge, and the latest failure data should be reassessed and documented annually. The reliability assessment report should be updated to reflect changes to the model or new conclusions about the model results. | 3) If "frequency of failure of active systems" is intended to mean frequency of initiating events this cannot be compared to reliability targets as there are no targets for IEs.<br>4) What is meant by the *"reliability assessment report"* in the last sentence? Should be clarified that this is the system assessment report to differentiate from the Annual Reliability Report. | 4) The last sentence has been changed as follows:<br>"*Changes to the model or new conclusions about the model results should be included in the annual reliability report, as per RD-99.1".* |
| 89 | OPGN | Section 3.6.4.3 | | 1) "frequency of failure of active systems" needs to be clarified. Does this mean frequency of initiating events? Otherwise it is additional requirement that has not been previously discussed.<br><br>2) If "frequency of failure of active systems" is intended to mean frequency of initiating events this cannot be compared to reliability targets as there are no targets for IEs.<br><br>3) What is meant by the "reliability assessment report" in the last sentence? Should be clarified that this is the system reliability model to differentiate from the Annual Reliability Report (ARR).<br><br>4) "As a minimum, system and procedural | 1) Yes, this refers to initiating events.<br>2) Comparison with the reliability target is only for poised systems.<br>3) The last sentence was removed.<br>4) The last sentence has been changed as follows:<br>"*Changes to the model or new conclusions about the model results should be included in the annual reliability report, as per RD-99.1".* |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | | changes …. should be reassessed annually". Need to be specific that this is part of the ARR scope. | |
| 90 | Hydro-Quebec, OPGN | Section 3.6.4.3 | Le glossaire ne fait pas de distinction entre les SIS actifs et les SIS en attente. Qu'entend la CCSN par un « événement opérationnel » ? | 1) Remplacer « fréquence de défaillance des SIS actifs » par « fréquence d'occurrence des événements initiateurs »<br><br>2) Remplacer « probabilité de défaillance des SIS en attente » par « Fiabilité observée des SIS »<br><br>3) Définissez « événement opérationnel » | 1) Pas de changement.<br>2) Pas de changement.<br>3) Le mot "événement Opérationnel" signifie un événement qui a lieu durant l'exploitation. Pour plus de clarté le mot « opérationnel » a été enlevé. |
| 91 | OPG | Section 3.7 | Following a CNSC staff inspection or request, a licensee should demonstrate effective implementation of its reliability program. | | No change. |
| 92 | NBPN | Section 3.8 | The last paragraph of this section is redundant to the third paragraph of Section 3.6.4.3. | | Agreed. Paragraph has been removed. |
| 93 | OPG | Section 3.8 | The CNSC should have access to the results of reliability programs at nuclear power plants. These results may be obtained at any time through periodic inspections of reliability programs and from reports prepared by licensees. Results could be recorded in the form of operational logs, work orders, work plans, work permits, test results and calibration records. The review of this information is required to assure accurate, timely assessment and reporting of the reliability performance of SIS. This information is also reviewed in order to identify and help avoid reductions in the reliability of these systems.<br>Licensees have discretion as to how they structure their reports that describe | 1) Requirements to report the results of reliability programs are described in CNSC Regulatory Document RD-99.2.<br><br>2) SB: Regarding the 2nd paragraph, the results of the reliability program work done by RSED do not take any of these formats. What format will be acceptable to the CNSC for audit purposes?<br><br>3) Last paragraph in this section should be removed, the requirement is addressed in RD-99.2<br><br>4) Clarification should be provided about interface between reporting requirements in this document and reporting requirements in R-7, R-8 and | 1) Agreed.<br>2) The format is left at the discretion of the Licensee.<br>3) Agreed. Paragraph has been removed.<br>4) Reporting requirements are governed by RD-99.1. |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | reliability assessments of SIS. However, licensees should report the results of their reliability programs according to CNSC Regulatory Document RD-99.1, *Reporting Requirements for Operating Nuclear Power Plants*. Guidance on what is required in the annual report on the risk and reliability of the NPP, along with a sample template, can be found in CNSC Guidance Document GD-99.1, *Guide to the Reporting Requirements for Operating Nuclear Power Plants*.<br>The comparison between predicted reliability, reliability performance indices and reliability targets should be reported. Any differences should be explained. | R-9. | |
| 94 | Hydro-Quebec | Section 3.8 | Le RD-99.1 et le GD-99.1 ne sont pas encore publiés et sujets à changement. Dans les documents mis en référence, le rapport de fiabilité se retrouve dans les RD-99.2 et le GD-99.2 | Retirer la référence au RD-99.1 et le GD-99.1. | La référence à RD-99.1 va être gardée et sera mise à jour, si nécessaire, à la publication de RD/GD-98. |
| 95 | OPG | Section 3.9 | Documenting a reliability program - This does not require specific guidance. | | No change. |
| 96 | Hydro-Quebec | Référence 1 | Le RD/GD-98 fait-il référence au S-98 révision 1. Est-ce que les 2 documents vont demeurer ou le RD/GD-98 remplacera le S-98 révision 1 | Enlever la référence au S-98 révision 1 | La référence à la norme d'application de la réglementation S-98 révision 1 a été enlevée.<br>Le document d'application de la réglementation RD/GD-98 remplacera cette norme. Cependant, il énonce les mêmes exigences que le document S-98. |
| 97 | Hydro-Quebec | Référence 8 | La date de publication du document R-9 n'est pas la bonne | Mettre la bonne date de publication | La date a été corrigée. |
| 98 | Hydro-Quebec | Référence 10 | Le RD/GD-210 est actuellement à l'étape de commentaires en même temps que le RD/GD-98. Comment les interrelations entre les 2 documents seront-ils intégrés | Définir un ordre pour commenter et finaliser un document avant l'autre afin d'assurer leur cohérence et complémentarité. | La cohérence entre les documents existe bel et bien.<br>La référence à S-210 va être gardée et |

| | Organization | Section | Comment | Suggested Change | CNSC Response |
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| | | | et harmonisés ?.<br>Note : Le RD/GD-210 fait référence au S-98 révision 1 et le RD/GD-98 fait référence au S-210. | | sera mise à jour, si nécessaire, à la publication de RD/GD-98. |
| 99 | Hydro-Quebec | Références : 11 à 14 | Ces documents ne sont pas encore publiés et ont subi des modifications significatives.<br>Pourquoi le RD/GD-98 fait-il référence à un document non encore publiée ? | Référer aux documents finaux<br>Attendre avant de finaliser le RD/GD-98 que le RD-99.1 et le GD-99.1 soient publiées<br>Permettre à HQ de refaire des commentaires sur le RD/CD-98 en fonction de la version finale des RD-99.1 et GD-99.1 (version octobre 2011) | La référence à RD-99.1 va être gardée et sera mise à jour, si nécessaire, à la publication de RD/GD-98. |
| 100 | Hydro-Quebec | Référence | Le programme des essais d'une centrale nucléaire devrait se baser sur le IEEE Std 338-2006. | Inclure dans le RD/GD-98 ou le RD/GD-210 la norme IEEE Std 338-2006. | Pas de changement. Cette référence n'est pas pertinente car elle traite des essais périodiques |
| 101 | Hydro-Quebec | Référence | La section 3.1 du RD/GD-98 fait référence aux ÉPS mais le S-294 n'est pas cité en référence. | | La référence à S-294 a été ajoutée à la Section 3.1.1. |
| 102 | Hydro-Quebec | Glossaire (F) | Le texte de plusieurs définitions n'est pas cohérent avec celui utilisé dans d'autres documents de la CCSN dont le RD-99.1 (version octobre 2011), le RD/GD-210 (version janvier 2012) ou le S-294<br>Plusieurs définitions ne sont pas identiques avec la terminologie reconnue au Canada ou à l'international.<br>Plusieurs termes en usage dans le modèle du rapport de fiabilité (Annexe B du GD-99.2) ne sont pas définis, décris ou utilisés dans le RD/GD-98. | Harmoniser la définition entre les documents de la CCSN.<br>Respecter la définition reconnue internationalement. Consultez l'annexe 1 du livre « Sûreté de fonctionnement des systèmes industriels » (Alain Villemeur, Editions Eyrolles, 1988 pour plus d'informations. | Les définitions ont été harmonisées avec celles contenues dans RD-99.1. |
| 103 | Hydro-Quebec | Glossary (E) | The text of several definitions is not coherent with those used in other CNSC documents such as RD-99.1 (October 2011), RD/GD-210 (January 2012) or S-294 | Harmonize the definition between the CNSC documents.<br>Respect the internationally recognized definitions | The definitions were harmonized with those in RD-99.1. |
| 104 | Hydro-Quebec | Glossaire | Le modèle proposé du rapport de fiabilité dans le GD-99.2 (annexe B) renferme des définitions dont certaines ne sont pas dans le RD/GD-98 ou sont différentes de celles du RD/GD-98. | Retirer du modèle dans le GD-99.2 les définitions relatives au programme de fiabilité. | Le commentaire concerne le GD-99.2. |

**Comments Report – Public Consultation**
**Draft Guidance Document: RD/GD-98, *Reliability Programs for Nuclear Power Plants***
Public consultation: January 9 – February 23, 2012;

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| 105 | Hydro-Quebec | Glossaire : centrale nucléaire | Le texte de la définition en français n'est pas identique à celui utilisé dans le RD-99.1 (version octobre 2011), ni avec celle du RD/GD-210 (version janvier 2012), ni avec celle du S-294 | Harmoniser la définition entre les documents de la CCSN. Utiliser le texte du RD-99.1 (version octobre 2011). | La définition a été mise à jour. |
| 106 | Hydro-Quebec | Glossaire : composant critique | La définition n'est pas claire. | Préciser ce que signifie une défaillance fonctionnelle. S'assurer d'être cohérent avec le glossaire du RD-99.1 (version octobre 2011) | La définition a été changée. |
| 107 | Hydro-Quebec | Glossaire : critère de défaillance | La définition n'est pas claire. | Préciser ce que signifie une défaillance fonctionnelle. S'assurer d'être cohérent avec le glossaire du RD-99.1 (version octobre 2011) | La définition a été changée. |
| 108 | Hydro-Quebec | Glossaire : défaillance d'origine commune | Le terme français n'est pas adéquat. | Utiliser le terme « Défaillance de mode commun » | Le terme a été changé à « Défaillance de Cause Commune » |
| 109 | Hydro-Quebec | Glossaire : défaillance naissante | Le terme français n'est pas adéquat. Le modèle de fiabilité (Annexe B du GD-99.2) utilise différent type de défaillance mais pas de celle-ci. | Harmoniser la définition entre les documents de la CCSN. Utiliser le texte du RD-99.1 (version octobre 2011). | D'accord. Le terme français incluse dans RD-99.1 a été adoptée. |
| 110 | Hydro-Quebec | Glossaire : défaillance | La définition ne respecte pas celle reconnu au Canada et à l'international.<br>Le texte de la définition en français n'est pas identique à celui utilisé dans le RD-99.1 (version octobre 2011), ni avec celle du RD/GD-210 (version janvier 2012)<br>Le modèle de fiabilité (annexe B du GD-99.2 propose une définition très différente de celle du RD/GD-98 | Harmoniser la définition entre les documents de la CCSN. Respectez la définition reconnue internationalement. | La définition incluse dans RD/GD-210 a été adoptée. |
| 111 | Hydro-Quebec | Glossaire : entretien | Le texte de la définition en français n'est pas identique à celui utilisé dans le RD-99.1 (version octobre 2011), ni avec celle du RD/GD-210 (version janvier 2012) | Harmoniser la définition entre les documents de la CCSN. Respectez la définition reconnue internationalement. | La définition incluse dans RD/GD-210 a été adoptée. |
| 112 | Hydro-Quebec | Glossaire : événement déclencheur | Le terme français n'est pas adéquat, ni cohérent avec celui utilisée dans le S-294.<br>Le texte de la définition en français n'est pas identique à celui utilisé dans le RD-99.1 (version octobre 2011). | Utiliser le terme « événement initiateur ».<br>Harmonisez la définition entre les documents de la CCSN. | La définition a été adoptée. |

**Comments Report – Public Consultation**
**Draft Guidance Document: RD/GD-98, *Reliability Programs for Nuclear Power Plants***
Public consultation: January 9 – February 23, 2012;

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| 113 | Hydro-Quebec | Glossaire : fiabilité | Le texte de la définition en français n'est pas identique à celui utilisé dans le RD-99.1 (version octobre 2011). | Harmoniser la définition entre les documents de la CCSN. Respectez la définition reconnue internationalement. | D'accord. La définition incluse dans RD-99.1 a été adoptée. |
| 114 | Hydro-Quebec | Glossaire : fiabilité prévue | La dernière phrase du texte de la définition ne fait pas partie de la définition mais des attentes de la CCSN | Retirer la dernière phrase. | Pas de changement. La fiabilité prévue doit être calculée aves les données de fiabilité mises a jouir. |
| 115 | Hydro-Quebec | Glossaire : importance de Fussell-Vesely | Le texte de la définition en français n'est pas identique, ni cohérent avec celui utilisé dans le S-294. | Harmoniser la définition entre les documents de la CCSN. | La définition incluse dans S-294 a été adoptée. |
| 116 | Hydro-Quebec | Glossaire : mesures d'importanc e | Le terme français n'est pas adéquat.<br>Le texte de la définition en français n'est pas identique, ni cohérent avec celui utilisé dans le S-294.<br>Pourquoi mettre le terme au pluriel ? | Utiliser le terme « Facteurs d'importance »<br>Harmoniser la définition entre les documents de la CCSN.<br>Mettre le terme au singulier. | S-294 utilise le terme Mesure d'importance.<br>Le pluriel a été supprimé. |
| 117 | Hydro-Quebec | Glossaire : objectifs de fiabilité | La définition n'est pas une définition.<br>La dernière phrase du texte de la définition ne fait pas partie de la définition mais des attentes de la CCSN.<br>Pourquoi mettre le terme au pluriel ? | Remplacer « Objectifs de fiabilité » par « Objectifs en terme de probabilité que le système accomplisse une fonction requise dans des conditions données, pendant une durée donnée »<br>Retirez la dernière phrase.<br>Mettre le terme au singulier. | D'accord. Les changements ont été apportés. |
| 118 | Hydro-Quebec | Glossaire : objectifs de sûreté | Ce terme relève du S-294.<br>Pourquoi mettre le terme au pluriel ? | Retirer cette définition | Pas de changement. Le terme est introduit dans le document, d'où la nécessité de donner la définition. |
| 119 | Hydro-Quebec | Glossaire : Rapport d'augmenta tion du risqué (RAR) | Le texte de la définition en français n'est pas identique avec celui utilisé dans le S-294 | Harmoniser la définition entre les documents de la CCSN. | La définition incluse dans S-294 a été adoptée. |
| 120 | Hydro-Quebec | Glossaire : structures, systèmes et composant s (SSC) | Le terme n'est pas identique à celui utilisé dans le RD-99.1 (version octobre 2011).<br>Le texte de la définition en français n'est pas identique avec celui utilisé dans le RD-99.1 (version octobre 2011). | Remplacer le « et » par un « ou » dans structures, systèmes et composants (SSC).<br>Harmoniser la définition entre les documents de la CCSN. | D'accord. La définition incluse dans RD-99.1 a été adoptée. |

**Comments Report – Public Consultation**
**Draft Guidance Document: RD/GD-98, *Reliability Programs for Nuclear Power Plants***
Public consultation: January 9 – February 23, 2012;

| | Organization | Section | Comment | Suggested Change | CNSC Response |
|---|---|---|---|---|---|
| 121 | Hydro-Quebec | Glossaire : surveillance de la fiabilité | Le terme non-indisponibilité n'est pas celui normalement en usage au Canada et à l'international. | Remplacer « non-disponibilité » par « indisponibilité » | D'accord. Changement effectué. |
| 122 | Hydro-Quebec | Glossaire : Système de sûreté | Ce terme ne correspond pas à ceux normalement en usage au Canada ou dans les autres documents de la CCSN. La définition est imprécise | Enlever cette définition ou précisez s'il s'agit de « Système de sûreté en attente », « Système relié à la sûreté » ou « Système spécial de sûreté ». Harmoniser la définition entre les documents de la CCSN. | La définition a été supprimée et la définition du système spécial de sûreté a été ajoutée. |
| 123 | Hydro-Quebec | Glossaire : Système importants pour la sûreté | Le texte de la définition en français n'est pas identique avec celui utilisé dans le RD-99.1 (version octobre 2011). | Harmoniser la définition entre les documents de la CCSN. | La définition incluse dans RD-99.1 a été adoptée. |