**Response to Public Comments on Draft Standard Review Plan (SRP) Chapter 17.4, "Reliability Assurance Program (RAP)**

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| | **NEI Comments:** | | |
| 1. | General comment<br><br>Consistent with the first paragraph in Section I, "This Standard Review Plan (SRP) section provides the staff guidance on how to perform safety reviews of the reliability assurance program (RAP) description in design certification (DC) and combined license (COL) applications." However, a future applicant could also elect to license a nuclear plant under 10 CFR Part 50 via the Construction Permit (CP) and Operating License (OL) process. This accommodation should not impact either the staff's review procedures or criteria, but should be acknowledged in SRP 17.4. | Revise SRP 17.4 to address NRC staff review of a RAP description under both 10 CFR Part 50 and Part 52. | Currently Item E, "Reliability Assurance Program," of SECY-95-132, "Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems (RTNSS) in Passive Plant Designs," the basis for the RAP, only identifies DC and COL applicants as affected parties. An applicant licensing a plant under 10 CFR Part 50 is not required to have a RAP in accordance with SECY-95-132, unless the Commission decides otherwise. |
| 2. | Section I. Areas of Review, Fourth Paragraph, Last Sentence, Page 17.4-2<br><br>There is an editorial error in the last sentence in the fourth paragraph of Section I. | Clarify the last sentence in the fourth paragraph of Section I as follows: "The second stage ~~is comprised of~~ comprises the reliability assurance activities …" | The staff agrees with the resolution; therefore, Section I will be revised as follows:<br><br>"The second stage comprises the reliability assurance activities …" |
| 3. | Section I. Areas of Review, Last bullet, Page 17.4-2<br><br>The last bullet introduces the term "implementation controls" which is not a | Revise bullet as follows:<br>• "~~Apply the implementation controls[2] of D- RAP (i.e., organization, design control, procedures and instructions, records,~~ | The staff agrees with the comment; therefore, Section I will be revised as follows to reflect NEI's proposed resolution and to be consistent with the grammatical structure of the |

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| consistently used industry term.<br>See also Comments 13 & 15.<br><br>Further, the current grammatical structure is confusing. | ~~corrective actions, and audit plans)~~ ~~during~~<br>~~design and construction activities. These~~ ~~implementation~~ Programmatic controls are ~~processes and controls~~ established that ensure the risk insights and key assumptions are consistent with the plant design and construction. These programmatic controls address organization responsibilities, design control activities, records, corrective action and assessment plans and that the list of RAP SSCs is appropriately developed, maintained, and communicated to the appropriate organizations." | resolution to NEI Comment 5:<br><br>"Programmatic controls that ensure the risk insights and key assumptions are consistent with the plant design and construction. These programmatic controls address organization responsibilities, design control activities, procedures and instructions, records, corrective action and assessment plans, and that the list of RAP SSCs is appropriately developed, maintained, and communicated to the appropriate organizations."<br><br>For consistency purposes, the revised text will be reflected throughout SRP 17.4, where necessary. Note, the text "procedures and instructions" is added as this is one of the programmatic controls. |
| 4. Section I. Areas of Review, Footnote 1, Page 17.4-2<br><br>Recommend a change in the last sentence in Footnote 1 to delete the phrase "and control reliability and availability" and add a sentence to include the phrase. This would clarify the last sentence of the footnote for readability purposes. | Revise the last sentence in Footnote 1, and add a new last sentence, as follows: "Implementation of D-RAP should be a process that ensures the plant is designed and constructed in a manner that is consistent with the risk insights and key assumptions ~~and control reliability and availability~~ of RAP SSCs. The RAP provides controls to maintain the reliability and availability of RAP SSCs." | The staff agrees with the comment; therefore, Section I will be revised as follows:<br><br>"Implementation of D-RAP should be a process that ensures the plant is designed and constructed in a manner that is consistent with the risk insights and key assumptions from the analyses used to identify and quantify risk ~~of RAP SSCs~~. The RAP provides controls to maintain the reliability and |

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| | | availability of RAP SSCs."<br><br>Note, the text "from the analyses used to identify and quantify risk" is used in the NRC staff resolution, as opposed to the text "of RAP SSCs" proposed in NEI's resolution. This is necessary to make the footnote consistent with the purpose of the RAP. This is also necessary because a risk insight or key assumption may cause a SSC to be not risk-significant. For example, a risk insight/assumption that the fire protection pumps are diverse (e.g., motor-operated pump and a diesel-driven pump) may result in these pumps being not risk-significant and not in scope of the RAP; however, it is still important to ensure the plant is designed and constructed consistent with this insight/assumption. |
| 5. Section I. Areas of Review, First bullet, Page 17.4-3<br><br>The current grammatical structure of the first bullet is confusing. | Revise bullet as follows:<br>• "~~Implement the~~ Appropriate programs for quality assurance (QA) related to design and construction activities (e.g., design, procurement, fabrication, construction, inspection, and testing activities)…" | The staff agrees with the comment; therefore, Section I will be revised as follows to reflect NEI's proposed resolution and to be consistent with the grammatical structure of the resolution to NEI Comment 3.<br><br>"Quality assurance (QA) programs related to design and construction activities (e.g., design, procurement, fabrication, construction, inspection, and testing activities) to provide control over activities…" |

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| 6. Section I. Areas of Review, discussion of D-RAP implementation phases, Page 17.4-3 – 4<br><br>The discussion of D-RAP implementation phases lists required activities for each phase, but uses the term "includes," suggesting the list is exemplary rather than exhaustive. E.g.,<br><br>"During the DC phase, the DC applicant develops and implements those portions of the D-RAP that apply to the DC. This effort includes:…"<br><br>The RAP requirements should be specified without potential ambiguity. | Remove ambiguity by revising the lead bullet for each D-RAP phase as follows:<br><br>"During the DC phase, the DC applicant develops and implements those portions of the<br>D-RAP that apply to the DC. This effort ~~includes~~ consists of:…"<br><br>"During the COL application phase, the COL applicant develops and implements those portions of the D-RAP that apply to the COL. This effort ~~includes~~ consists of:…"<br><br>"Prior to initial fuel load, the COL licensee is responsible for implementing the D-RAP, which ~~includes~~ consists of:…" | The staff agrees with the comment; therefore, Section I will be revised as follows:<br><br>"During the DC phase, the DC applicant is responsible for developing and implementing those portions of the D-RAP that apply to the DC. This effort consists of:…"<br><br>"During the COL application phase, the COL applicant is responsible for developing and implementing those portions of the D-RAP that apply to the COL. This effort consists of:…"<br><br>"Prior to initial fuel load, the COL licensee is responsible for implementing the D-RAP, which consists of:…"<br><br>Note, the text "is responsible for" is added in response to Jim August Comment 14. |
| 7. Section I. Areas of Review, Third paragraph beginning, "The objective," Page 17.4-4<br><br>The third paragraph on Page 17.4-3 refers to "the operations phase of the plant's life cycle." For clarity, "life cycle" should be replaced with "license. | Clarify the first sentence of the third paragraph on Page 17.4-4 by replacing "life cycle" with "license." | The staff agrees with the comment; therefore, all references to "life cycle" will be replaced with "license." |
| 8. Section I. Areas of Review, Second bullet, | Delete the terms "certification | The statement "COL Action Items and |

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| | Page 17.4-5<br><br>This bullet states, "*COL Action Items and Certification Requirements and Restrictions*. For a DC application, the review will also address COL action items *and requirements and restrictions*.<br><br>For a COL application referencing a DC, a COL applicant must address COL action items (referred to as COL license information in certain DCs) included in the referenced DC. *Additionally, a COL applicant must address requirements and restrictions in the referenced DC.*" [Emphasis added.]<br><br>What is the basis for adding the new terms "Certification Requirements and Restrictions"? COL Action item(s) is a well understood term/concept. Delete the new terms or clarify the terms/concepts in the SRP if they will remain in this revision. | requirements and restrictions" and revise the second bullet as follows:<br><br>• "COL Action Items ~~and Certification Requirements and Restrictions~~. For a DC application, the review will also address COL action items ~~and requirements and restrictions~~.<br><br>For a COL application referencing a DC, a COL applicant must address COL action items (referred to as COL license information in certain DCs) included in the referenced DC. ~~Additionally, a COL applicant must address requirements and restrictions in the referenced DC.~~" | Certification Requirements and Restrictions" is boilerplate language that is used throughout the Standard Review Plan and refers to interface requirements and site parameters. Section I will be revised consistent with other Standard Review Plan sections as follows:<br><br>"COL Action Items and Certification Requirements and Restrictions. For a DC application, the review will also address COL action items and requirements and restrictions (e.g., interface requirements and site parameters).<br><br>For a COL application referencing a DC, a COL applicant must address COL action items (referred to as COL license information in certain DCs) included in the referenced DC. Additionally, a COL applicant must address requirements and restrictions (e.g., interface requirements and site parameters) in the referenced DC." |
| 9. | Section I. Areas of Review, Review Interfaces item 2, Page 17.4-5<br><br>Item 2 contains the first use of the acronym "RTNSS" within this SRP section. RTNSS should be defined prior to use. | Insert "Regulatory Treatment of Non-Safety Systems" prior to the first use of "RTNSS." | The staff agrees with the comment; therefore, Section I will be revised as follows:<br><br>"The applicant's program for Regulatory Treatment of Non-Safety Systems (RTNSS)…" |

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| 10. Section II. Acceptance Criteria, Paragraph A.2, Pages 17.4-6 & 7<br><br>Paragraph A.2 uses the term "implementation controls" which is not a consistently used industry term. See previous Comment 5. | Replace "implementation controls" with "programmatic controls." | The staff agrees with the comment; therefore, all references to "implementation controls" will be replaced with "programmatic controls." |
| 11. Section II. Acceptance Criteria, item 6, Page 17.4-8<br><br>Editorial suggestion to simplify for readability. | Simplify item 6 as follows:<br><br>"6. The application should describe the audit plans for ~~conducting audits of~~ D-RAP activities." | The staff agrees with the comment; therefore, Section II will be revised as follows:<br><br>"6. The application should describe the audit plans for D-RAP activities." |
| 12. Section II. Acceptance Criteria, Paragraph B.1, Page 17.4-12<br><br>Paragraph B.1 uses the term "implementation controls" which is not a consistently used industry term. | Revise paragraph B.1 as follows:<br><br>"Plant-Specific Reliability Assurance Program<br><br>The applicant should appropriately update the description of the D-RAP to include relevant COL site- and plant-specific information (e.g., design, program, procedural, and organizational information). This includes (1) identifying the SSCs within the scope of the plant-specific RAP (i.e., the RAP SSCs identified in the DC, updated using COL site- and plant-specific information), and (2) establishing the ~~implementation~~ programmatic controls of D-RAP (see Section A.2) that are applied during the COL design and construction activities prior to initial fuel load. These | The staff agrees with the comment and resolution; therefore, all references to "implementation controls" will be replaced with "programmatic controls."<br><br>Also, all references to "… controls are processes and controls that …" will be replaced with "… controls are processes that …" |

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| | ~~implementation~~ programmatic controls are processes ~~and controls~~ that ensure the plant will be designed and constructed in a manner that is consistent with the risk insights and key assumptions from probabilistic, deterministic, and other methods of analysis used to identify and quantify risk. If needed, the staff can perform one or more audits to verify that the applicant appropriately applied the ~~implementation~~ programmatic controls of D-RAP during design activities in the COL application phase. | |
| 13. Section II. Acceptance Criteria, Paragraph B.2, Page 17.4-12<br><br>Suggest a title revision for simplification. | Revise the title of Paragraph B.2 as follows:<br><br>"Quality Assurance Program ~~Associated with Design and Construction Activities~~" | The staff disagrees with the resolution. Acceptance Criteria B.2 pertains to the COL's D-RAP program during the design and construction phase prior to initial fuel load. The proposed change could create confusion, as this paragraph is not discussing the entire quality assurance program, rather just the portion of the quality assurance program associated with design and construction activities. |
| **Jim K. August Comments:** | | |
| 1. Most often, "SSC" refers to what we would term "components," and then secondarily, "Systems." | Context for the use of SSC should be noted where the term is used. | The staff disagrees with the comment. The term SSCs is used to describe systems, structures, AND components, not individual systems, structures, OR components. The scope of RAP includes systems, |

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| | | structures, and components identified as risk-significant and are specifically identified in the DC and COL applications. |
| 2. The SRP proposed seeks to provide guidance for new plant owners to meet NRC RAP regulatory requirements. However, providing this document's RAP guidance will not assure the intent of the SECY 95-132 -- the validity of the PRA. | | The staff disagrees with the comment. The NRC RAP is not a regulatory requirement. The basis for implementing the NRC RAP is the Commission's direction in the Staff Requirements Memorandum dated June 28, 1995, for Item E of SECY-95-132. The intent of SRP 17.4 is not to provide guidance to applicants on how to develop a RAP, but rather to provide guidance to the staff on how to perform safety reviews of the RAP description in DC and COL applications. In addition, SRP 17.4 is designed to improve communication about the RAP review process among the representatives of the nuclear power industry and interested members of the public. The intent of Item E of SECY-95-132 is not to validate the PRA, but rather to provide reasonable assurance that: "(1) an advanced reactor is designed, constructed, and operated in a manner that is consistent with the assumptions and risk insights for these risk significant SSCs, (2) the risk significant SSCs do not degrade to an unacceptable level during plant operations, (3) the frequency of |

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| | | transients that challenge advanced reactor SSCs are minimized, and (4) these SSCs function reliably when challenged." |
| 3. The fundamental requirements will assure legacy requirements from Generation II light water reactors (LWRs) will continue to apply. It will not cover new equipment such as digital controls, combustion turbines (provided in standby electrical supply Class IE service) or other new technology. The prolific application of digital processors embedded in components like air-operated valves (AOV), motor-operated valves (MOV) and switchgear will not be covered. | | The staff disagrees with this comment. New equipment such as digital controls and combustion turbines, if determined to be risk-significant, would be within the scope of the RAP and subject to the QA program, maintenance rule program, inservice inspection, inservice testing, surveillance testing, and maintenance programs. This includes equipment subcomponents such as digital processors. The maintenance rule program ensures the effectiveness of maintenance on this equipment. Also, see response to Jim August Comment 4. |
| 4. The SRP does not:<br>• assure that "in scope" RAP SSC will meet their service reliability and availability requirements from the beginning of their service life; or<br>• reasonably assure the RAP. | | The staff disagrees with this comment. The comment provides no specific details as to how the SRP does not assure the RAP. The basis for implementing the NRC RAP is the Commission's direction in the Staff Requirements Memorandum dated June 28, 1995, for Item E of SECY-95-132 and applies to those SSCs classified as risk-significant. The RAP is an important component of a new reactor license application |

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| | | and is intended to provide reasonable assurance of the following: (1) the reactor will be designed, constructed, and operated in a manner that is consistent with the risk insights and key assumptions for the risk-significant SSCs; (2) the risk-significant SSCs will not degrade to an unacceptable level of reliability, availability, or condition during plant operations; (3) the frequency of transients that challenge these SSCs will be minimized; and (4) these SSCs will function reliably when challenged. The effectiveness of maintenance for risk-significant SSCs is improved by applying risk information and implementing other reliability assurance activities during a plant's design, construction, and operational phases. The purposes of the RAP can be met by implementing existing regulatory requirements and includes the following reliability assurance activities for which numerous standards and guidance have been developed.<br><br>• Processes and controls should ensure the plant will be designed and constructed in a manner that is consistent with the risk insights and key assumptions from the probabilistic and deterministic methods used to identify and |

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| | | quantify risk.<br><br>• The maintenance rule program (10 CFR, Section 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants") should be implemented in a manner consistent with Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," with all risk-significant SSCs categorized as having high safety significance. This ensures that performance goals are established for the risk-significant SSCs and that performance and condition monitoring are performed to provide reasonable assurance that these SSCs do not degrade to an unacceptable level of reliability, availability, or condition during plant operations.<br><br>• The quality assurance program for safety-related SSCs is established in accordance with 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."<br><br>• The quality assurance controls for non-safety-related, risk-significant |

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| | | SSCs are established in accordance with Part V, "Non-safety-Related SSC Quality Controls," of SRP Section 17.5, ”Quality Assurance Program Description—Design Certification, Early Site Permit and New License Applicants.”<br><br>• Inservice inspection, inservice testing, surveillance testing, and maintenance programs are provided for the risk-significant SSCs.<br><br>The RAP does not discourage standardization of these reliability assurance activities. For example, the RAP would not impede on development of a standardized scheduled maintenance program, which is an industry option for implementing maintenance. The RAP provides controls to maintain the reliability and availability of RAP SSCs. It should not be interpreted as a numerical analysis that would require the estimated reliability of each as-built RAP SSC to be at least equal to the reliability assumed in the PRA.<br><br>In accordance with SECY-95-132, DC and COL applications should contain a description of the RAP that will be |

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| | | implemented during the design, construction, and operation phases. As such, NRC composed SRP Section 17.4, dated March 2007, to provide the staff guidance on how to perform safety reviews of the RAP description in DC and COL applications. In addition, SRP Section 17.4 is designed to improve communication about the RAP review process among the representatives of the nuclear power industry and interested members of the public. Reviews of reliability assurance activities related to the RAP (e.g., maintenance rule program, quality assurance program for safety-related and non-safety-related SSCs, quality control of the probabilistic risk assessment, PRA, surveillance testing) are performed under other SRP sections by staff with the appropriate qualifications. Review of the list of risk-significant SSCs in scope of the RAP is performed by NRC PRA staff and supported, as necessary, by other NRC technical organizations. Based on the lessons learned and insights gained from the reviews of DC and COL applications, the staff found that the 2007 version of SRP Section 17.4 needed to provide clearer guidance. Therefore, the staff updated SRP Section 17.4 to clarify |

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| | | how the staff will review the RAP description in DC and COL applications.<br><br>In regards to the maintenance rule program, the NRC believes that proper maintenance is essential to plant safety and that, to maintain safety, it is necessary to monitor the effectiveness of maintenance, and take timely and appropriate corrective action, where necessary, to ensure the continuing effectiveness of maintenance for the lifetime of nuclear power plants, particularly as plants age. The maintenance rule under 10 CFR, Section 50.65 requires that licensees monitor the performance or condition of certain SSCs against licensee-established performance goals in a manner sufficient to provide reasonable assurance that those SSCs will be capable of performing their intended functions. Licensees are required to evaluate the overall effectiveness of their maintenance programs, taking into account industry-wide operating experience, and adjust their programs where necessary to ensure that the prevention of failures is appropriately balanced with the minimization of unavailability of SSCs due to monitoring and preventative |

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| | | maintenance. Maintenance rule also requires that before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), licensees assess and manage the increase in risk that may result from the proposed maintenance activities. In formulating the rulemaking, the NRC considered maintenance approaches in other countries and reviewed practices in other industries in this country in which equipment reliability and maintenance play an important role in safe operations. The regulatory activities associated with these maintenance practices were also examined to assess their effectiveness and applicability to the NRC. The study examined the nuclear maintenance regulations and practices in Japan, France, and the Federal Republic of Germany. Also assessed was the Federal Aviation Administration's (FAA) role in the maintenance of U.S. commercial aircraft and the U.S. Navy and Air Force maintenance programs. Through this work, selected successful maintenance practices and regulations and maintenance "lessons learned" were identified and used to facilitate formulating this rulemaking. The |

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| | | approach taken by NRC in developing this rulemaking included industry participation in the preparation of standards and implementation of the rule. This approach promotes industry responsibility, leadership, and interaction within the industry for the development of effective maintenance programs, for the sharing of effective maintenance practices, and for the continual improvement and enhancement of maintenance technology. |
| 5. The SRP does not:<br>• provide new nuclear plants an effective RAP program for Safety Related, Safety Significant equipment plants starting out their service life;<br>• provide the best possible maintenance program for new nuclear plants' reliability assurance starting out their lifetimes;<br>• clearly identify expectations for licensees to develop high-quality maintenance and monitoring programs from the start of operations;<br>• assist prospective owners in obtaining the highest quality of information on SSC failure modes and mechanisms to plan for their effective servicing over the life of the plant; or<br>• provide a clear path using the best | | The staff disagrees with this comment. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications. Also, see response to Jim August Comment 4. |

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| available nuclear and non-nuclear guidance to clear up an area of clear misunderstanding. | | |
| 6. The SRP helps ensure that in the absence of industry individual plant programs with standard common components and system designs will develop independently, discouraging standardization around component types and suppliers and plant design types This is contrary to new plant design standardization goals. | | The staff disagrees with this comment. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications. Also, see response to Jim August Comment 4. |
| 7. The SRP fails to explain clearly what RAP is, in current practice terms. Because what constitutes the RAP is unclear, developing it is also unclear. "RAP" itself is a uniquely regulatory term; no other industry uses it. Unless RAP is defined clearly this creates confusion. | | The staff disagrees with this comment. RAP is defined in Section I of SRP 17.4. |
| 8. Tasks that fulfill the complex abstract RAP reliability goals require clear implementation steps for those who develop RAP. | Standards from high-risk technical industries and the US military are available. Identifying and extracting guidance from those manuals would provide source materials to reference. This will clarify RAP, as well as interim requirements. | The staff disagrees with this comment. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications. Also, see response to Jim August Comment 4. |
| 9. The regulatory purpose of a RAP is to maintain the PRA. In practice, the RAP | | The staff disagrees with this comment. See response to Jim August |

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| | should assure that programs maintain plant equipment so that it is reliable and available to meet functional requirements specified. For in-scope RAP equipment, RAP supports safety functions and the PRA. For the balance of plant equipment, scheduled maintenance and monitoring programs assure that it maintains enough reliability and availability to support plant operating production and cost goals. | | Comments 2 and 4. |
| 10. | Technically, the RAP scope is limited to only safety related (SR) and safety significant (SS) SSC. Practically other RAP-like balance-of-plant (BOP) scheduled maintenance and monitoring programs support the reliability and availability of the entire nuclear plant, outside RAP regulatory scope. | A clear method to accomplish the objective developing RAP should be provided. | The staff disagrees with the comment. Item E of SECY-95-132 and SRP 17.4 clearly define the scope of the RAP to be risk-significant SSCs (both safety-related and non-safety-related). Additionally, SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications. |
| 11. | An ITAAC that approves current guidance would be ineffective achieving the goal of the RAP, page 17.4-6, item 2, which cites 10CFR52.47(b)1. This ITAAC could not provide “necessary and sufficient” criteria to reasonably assure that the plant can conform to its design-certified reliability and availability, without providing additional requirements. While most licensees will attempt to establish programs that meet RAP voluntarily, the | | The staff disagrees with the comment. Items 2 and 3 are not referring to a single ITAAC, but rather a set of ITAAC that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, the facility has been constructed and will be operated in conformity with the design |

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| methods that they will use will vary without clear guidance, industry standards, or an effective program model to follow. SRP 17.4 guidance lacks an effective program model. In the same manner, guidance for Combined Licenses would be ineffective achieving the goal of the RAP, page 17.4-6, item 3, 10 CFR 52.80(a). | | certification or the COL, the provisions of the Atomic Energy Act, and NRC regulations. Also, see response to Jim August Comment 4. |
| 12. SSC referred to as "in scope" need better identification. Better guidance needs to be used to identify RAP SSC. Current lists of SSC for PRA and RAP are widely disparate. Better guidance should relate the two lists. (PRA can simply not cope directly with the total number of RAP SSC.) | | The staff disagrees with the comment. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific details of what SSCs should be included in their RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications.<br><br>Additionally, there is no basis for having applicants compare RAP SSCs and PRA SSCs. Many PRA SSCs are not within the scope of the RAP, because they are not considered risk-significant.<br><br>Based on Item E of SECY-95-132 and SRP 17.4, SSCs within the scope of the RAP (i.e., risk-significant SSCs) are identified using a combination of probabilistic and deterministic methods. Many acceptable methods exist for identifying these risk-significant SSCs (e.g., NRC |

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| | | Regulatory Guides 1.160 and 1.201). As such, it would not be appropriate to specify a single methodology in SRP 17.4, but rather to provide high-level criteria for identifying risk-significant SSCs, which the staff could use to facilitate their review of the applicants methodology for identifying risk-significant SSCs. Deterministic methods and use of an expert panel play an important role in identifying risk-significant SSCs and could compensate for the limitations of the PRA. Section III ("Review Procedures") of SRP 17.4 lists regulatory guides that can facilitate the staff's review of the applicant's methodology for identifying risk-significant SSCs. |
| 13. This leaves the dominant failure mode (DFM) identification process to the DC applicant but provides no guidance as to how DFM failure modes are used in the design and procurement stages. There should be a statistical basis for identifying DFM (e.g., so they are truly frequently observed). | DFMs must integrate into the operational program and be observed statistically, not developed as academic exercises. | The staff disagrees with this comment. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications. As part of the review of the applicant's RAP description, the staff ensures that DFMs are considered in the process for integrating RAP into operational |

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| | | programs (SRP 17.4, Acceptance Criteria B.3). |
| 14. "During the COL application phase, the COL applicant develops and implements those portions of the D-RAP that apply to the COL…" The COL applicant lacks the expertise to develop and implement these portions of the D-RAP. They do not have the new SSC knowledge from performance history to identify its DFM. Yet the RAP calls for them to do it, though it is generally not their expertise, especially for new equipment. | Even if the COL applicant staff could, the supplier's experts would be better equipped to do it based on knowledge of the design and awareness of its failure experience. Details like this should be standardized across a nuclear design and its COL. | The staff disagrees with this comment. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications.<br><br>The COL applicant does not identify dominant failure modes, but rather the COL licensee does prior to initial fuel load. The holder of the COL license is responsible for developing and implementing those portions of the D-RAP that apply to the COL. If the COL out-sources the work to subject matter experts, the COL licensee is still ultimately responsible. Section I of SRP 17.4 will be clarified as shown in NEI Comment 6. |
| 15. SRP 17.4 should identify exactly what plant programs are, so transitional/integration work from the D-RAP to the Maintenance Rule (formerly called Operational RAP or O-RAP) can be done clearly, directly and without a lot of redevelopment of the work's technical the basis. | | The staff disagrees with this comment. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program |

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| | | description in DC and COL applications. As part of the staff's review of the applicant's RAP description, acceptance criterion B.3 of SRP 17.4 addresses the criteria for integrating the RAP into operational programs.<br><br>Also, see response to Jim August Comment 4. |
| 16. The SRP should generalize developing maintenance programs beyond preexisting Part 50 deterministic programs. It should explain how that is done (maintenance programs) and why it is beneficial. | | The staff disagrees with this comment. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications. Also, see response to Jim August Comment 4. |
| 17. Approximately 30% of new SR equipment SSC tags have no legacy prescriptive guidance. New components will be custom developed differently without common guidance, overall less efficiently and more complex. | | This comment is out-of-scope. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications.<br><br>Also, see response to Jim August |

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| | | Comment 4. |
| 18. Right now, there will be an overall ITAAC that verifies there will be a RAP program. Developing the ITAAC should be broken down into distinct measurable RAP program development step parts. The ITAAC(s) should address the program and the specific systems covered "in scope" that will have specific RAP development steps. Ultimately, they should be included as part of a documented standard or rule. | | See response to Jim August Comment 11. The staff verifies the COL licensee's implementation of the D-RAP using the ITAAC process, as well as inspections during detailed design and construction prior to initial fuel load. |
| 19. The "Maintenance Rule" (MR), 50.65, developed from NUMARC 93-01, provides no guidance for developing PM programs. Meeting the Maintenance Rule performance criteria and goals is directly linked to preexisting PM programs, for Part 50 plants. This guidance does not prescribe how to develop the initial actionable RAP program for a new plant. | | This comment is out-of-scope. Maintenance rule is discussed in SRP Section 17.6.<br><br>Maintenance rule monitors the effectiveness of maintenance (including effectiveness of preventative maintenance), and takes timely and appropriate corrective action, where necessary, to ensure the continuing effectiveness of maintenance for the lifetime of nuclear power plants. Also, see response to Jim August Comment 4. |
| 20. Preventive (Scheduled) Maintenance is an actionable, value-added tool but Maintenance Rule (NUMARC 93-01) has little or no guidance for developing PM programs. | | This comment is out-of-scope. Maintenance rule is discussed in SRP Section 17.6.<br><br>Maintenance rule monitors the effectiveness of maintenance (including effectiveness of |

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| | | preventative maintenance), and takes timely and appropriate corrective action, where necessary, to ensure the continuing effectiveness of maintenance for the lifetime of nuclear power plants. Also, see response to Jim August Comment 4. |
| 21. The Reliability Assurance Program (RAP) Guidance in SRP 17.4 is confusing, incomplete, and ineffective. Following it does not assure developing an effective RAP, as intended. Signoff of an ITAAC for SRP 17.4, would merely document conformance to ineffective guidance in SRP 17.4. It would not assure safety systems, structures and component reliability and availability, as intended by SECY 95-132 -- the original basis for Part 52 and this section of the SRP. | | As there are no specific details as to how SRP 17.4 is confusing, incomplete, and ineffective, staff cannot resolve this comment.<br><br>As discussed in the response to Jim August Comment 4, the staff believes that the updated SRP 17.4 provides clear and appropriate guidance to the staff on how to perform safety reviews of the RAP description in DC and COL applications and improves communication about the RAP review process among the representatives of the nuclear power industry and interested members of the public. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications. |
| 22. An effective RAP should | | This comment is out-of-scope. |

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| • Follow accurate technical guidance<br>• Categorize SSC consistently for risk, removing any arbitrary nature of SSC Classification<br>• Define systems/skids/trains/channels/SSC/parts for SSC hardware classification. Most legacy Part 50 plants had these subordinate SSC designed less effectively than possible, today.<br>• Quickly, simply evaluate risk with Out-Of-Service (OOS) or Inoperable SSC, when status change causes it to enter that mode<br>• Bring focus to high risk safety-significant or safety related SSC, including deselecting nonessential low risk embedded SSC parts<br>• Be complete for all applicable SSC<br>• Be clear<br>  o The intended RAP program is what is commonly termed "scheduled maintenance"<br>  o Develop a RAP program from first principles, not legacy requirements intended for legacy equipment forty years ago<br>  o Identify and include basic reliability elements - condition monitoring, testing and replacement/overhauls scheduled to occur based on phenomenological knowledge | | SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications.<br><br>As discussed in the response to Jim August Comment 4, the staff believes that the updated SRP 17.4 provides clear and appropriate guidance to the staff on how to perform safety reviews of the RAP description in DC and COL applications and improves communication about the RAP review process among the representatives of the nuclear power industry and interested members of the public. |

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| and risk<br>• Define RAP elements, which (in my opinion) center around traditionally-termed Scheduled Maintenance and Rounds<br>o Condition Assessments<br>o Tests<br>o Alarm Checks (Local SSC and Distributed Controls)<br>o Down select tasks considered to general nonspecific operator monitoring when no direct failure effects occur<br>o No scheduled maintenance (NSM) when no effects are observed<br>o Servicing (Hard Time)<br>o Lubrications (Hard Time)<br>o Overhauls (Hard Time)<br>• Provide for Operator rounds<br>• Provide for SSC parts “age exploration” (a program to develop part lifetimes)<br>• Supersede past deterministic guidance with current risk-informed, performance -based principles<br>• Develop an effective RAP program that meets intended SECY 95-132 RAP goals from first principles<br>• Be developed in computer software formats that include controlled tables and files<br>• Provide a way to update plant design changes | | |

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| • Identify what constitutes a “RAP”<br>• Provide a clear development process<br>• Use the best available information, based upon risk-based PRA combined with deterministic methods.<br>• Seek nuclear component vender equipment failure information, using their profound knowledge of their equipment, with technical insights to provide a relevant Scheduled and condition-based maintenance base, with Parts replacements, inspection, and servicing as due-diligence.<br>• Develop a fundamentally invariant RAP maintenance process common to all SSC, regardless of historical precedent and historically deterministic rules.<br>• Identify the safety functions provided (this should be clear from the license Section Safety Analyses 15 and PRA)<br>• Partition SSC using analysis as needed, no more; e.g., “necessary and sufficient.” (Standard 1)<br>• Develop actual dominant failure mechanisms using statistical insights not enumerating lists, identifying symptoms and causes<br>• Identify effective tasks and their initial performance intervals considering the phenomenological nature of failure and functions provided (e.g., risk of failure) | | |

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| 23. 17.4 focuses on developing the list of RAP SSCs and ensuring that the implementation controls maintain integrity between the PRA assumptions and the system design. For the operational phase, some of these programs (e.g., IST/ISI) are surveillance or performance measuring tools that by themselves they do not maintain or improve reliability. | | No change to SRP 17.4 is necessary from this comment. IST, ISI, and surveillance testing are used to discover degraded or failed SSCs and affect SSC availability (i.e., the time that a SSC is capable of performing its intended function as a fraction of the total time that the intended function may be demanded). In addition, the objective of preventing SSC failures through maintenance should be appropriately balanced against the objective of minimizing SSC unavailability due to monitoring and maintenance. As such, SSC reliability and availability are important aspects to nuclear plant safety and are monitored in maintenance rule under 10 CFR 50.65. RAP integrates use of maintenance rule in addition to other operational programs. |
| 24. Methods for update of the RAP that fall outside the scope of normal design control should be discussed. | | The staff disagrees with this comment. SRP 17.4 is not designed to provide guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications. |
| 25. Depending on incomplete legacy Part 50 | | See response to Jim August |

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| | methods, the SRP cannot address RAP for new design SSC like distributed controls, combustion turbines, or components with local microprocessor controls. These are common everywhere – indeed, any non (ASME) Section XI mechanical or other modern equipment that will be used in new nuclear construction will not be covered. The only equipment covered will be legacy SSC for existing legacy Part 50 plants. That does not meet SECY 95-132 RAP goals. | | Comment 3. |
| 26. | Approving an ineffective ITAAC for RAP would be self-defeating, counterproductive to long-term nuclear safety goals. | | The staff agrees with this comment and will not approve ineffective ITAAC for RAP. |
| 27. | Clearly identifying what RAP shall provide per the SRP will substantially improve plant guidance and lower development costs. Not providing clear guidance will lead to reinterpretation, redevelopment, rework, and much higher costs for future nuclear plants, beyond its negative impact on public health and safety. | | The staff agrees with this comment and has provided this identification in Section II "Acceptance Criteria." |
| 28. | Those details that establish clear scope and address the initial maintenance program from which the Maintenance Rule will evolve simply are not covered. Beginning a Scheduled Maintenance Program at the Maintenance Rule with an avoidable safety event for any SR SSC does not demonstrate a prudent approach to nuclear safety goals. | | This comment is out-of-scope. Maintenance rule is discussed in SRP Section 17.6.<br><br>Also, see response to Jim August Comment 4. |
| 29. | To provide a method to move forward while the current SRP material is under review, I | | This comment is out-of-scope. SRP 17.4 is not designed to provide |

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| suggest forming a consensus-based approach under a consensus body of professional societies with an industry-centered design user group by performing a pilot with a new plant. Equivalently, standards could be developed to review and endorse for the same purpose. | | guidance to applicants on how to develop specific aspects of the RAP, but rather to provide staff guidance on how to perform safety reviews of the reliability assurance program description in DC and COL applications.<br><br>This comment appears to be addressing an industry option for implementing maintenance at plants (i.e., standardized scheduled maintenance program). This option for implementing maintenance is not a regulatory requirement and is not required by the reliability assurance program described in Item E of SECY-95-132. Therefore, the decision to implement this comment should be made by industry. |