DG-1145, Pre-Workshop Public Comments and Questions

The following are questions and comment submitted by the public prior to the public workshop held on July 10-12, 2006.

C.I.3.7.2.4-1 The last sentence in Section C.I.3.7.2.4 states, "Provide discussion of any other methods used for SSI analysis or the basis for not using SSI analysis. The AP1000 design control document (DCD) simply states that SSI is not significant for the nuclear island founded on rock with a shear wave velocity greater than 8000 ft/sec. Is a reference to this section of the DCD adequate justification for a combined license (COL) application?

C.I.3.9-1 The titles of sections C.I.3.9.7 and C.I.3.9.8 suggest content will be provided later for risk-informed in-service testing and inspection. Will this guidance be for optional risk-informed programs?

C.I.3.9.2.4-1 The last sentence of Section C.I.3.9.2.4 implies that the subject testing may be completed at the time the combined license (COL) application is submitted. Is this in reference to prototype reactor testing? If so, what additional testing is required for a non prototype reactor?

C.I.3.11.3-1 The wording in the first sentence in section C.I.3.11.3, “Qualification Test Results”, requires documentation of test results while the wording in the same section of Regulatory Guide 1.70 required test results. What is intended by this wording change? Current operating plants provided environmental qualification test results in the safety analysis report (SAR) and maintained documentation packages on site for NRC inspection.

C.I.3.12-1 What topics will be covered Section C.I.3.12 that are different from the piping design information required in sections C.I.3.6, C.I.5.2, etc.?

C.I.3.13.1.4-1 For Section C.I.3.13.1.4, preservice Inspection results will not be available at the time the combined license (COL) application is submitted.

C.I.5.2.4.1-1 The last sentence in Section C.I.5.2.4.1 refers to the ISI (inservice inspection) program in Chapter 16, "Technical Specifications". ISI programs are no longer included in the Tech Specs.

C.I.5.2.4.1-2 Section C.I.5.2.4.1, "ISI and IST Programs" provides a list of 9 items to be provided in the combined license (COL) application to allow the Staff to make a reasonable assurance finding. Some of the 9 items will not be available at the time the combined license application is submitted. For example, items 1, 2, 7 and 8 would not be complete at COL application. Item 1 can be completed for major components of the reactor coolant pressure boundary (RCPB). For item 2, it is not expected that all remote access equipment would be identified several years before the examinations. Also, items 7 and 8, code exemptions and relief requests will not be developed at the time the application is submitted. The list

should be modified to indicate that all such items that have been identified will be included in the application.

C.I.5.3.1.1-1 The last sentence in Section C.I.5.3.1.1, "Material Specifications" states that "Information provided in Chapter 5 of the final safety analysis report (FSAR) may be incorporated by reference". This section is guidance for Chapter 5. The same comment applies in other locations.

C.I.5.3.2.2-1 Section C.I.5.3.2.2, "Operating Procedures": This section requests a comparison with intended operating procedures. The operating procedures will not be complete at the time the combined license (COL) application is submitted. The section should require a commitment that the procedures will include provisions to assure the limits are met.

C.I.5.4-1 Sections C.I.5.4.4, C.I.5.4.5, C.I.5.4.9, C.I.5.4.10, C.I.5.4.13 and C.I.5.4.14. These sections are reserved. What are the subjects and when is the guidance expected?

C.I.6.1.1.1-1 Item (1) in Section C.I.6.1.1.1 requests "List the material specifications for all pressure-retaining ferritic materials, austenitic stainless steels, and nonferrous metals, including bolting and welding materials, in each component (e.g, vessels, piping, pumps, and valves) that are part of the engineering safety features (ESF) systems." It was only "principle" materials in RG 1.70. What is the basis for the expansion?

C.I.6.1.1.1-2 Item (2) in section C.I.6.1.1.1 requests "List the engineering safety feature (ESF) construction materials that would be exposed to the core cooling water and containment sprays in the event of a loss-of-coolant accident (LOCA). Provide test data and service experience to show that the construction materials used are compatible with the core cooling and containment spray solutions." Service experience should be sufficient in many cases, e.g, familiar/common materials and solutions. Test data should only be required where insufficient experience is available.

C.I.6.1.1.1-3 Item (3)©) in Section C.I.6.1.1.1 requests "Cold-worked austenitic stainless steel should not be used for pressure boundary applications. It may be used for other applications when there is no proven alternative available. Use of such materials should be supported by service experience and laboratory testing that simulates the environment to which the components will be exposed." If no use of these materials for pressure boundary is a new restriction, please provide the basis. Also, the request for both service experience and laboratory testing seems excessive. Service experience should be sufficient in many cases, e.g, familiar/common materials and solutions. Laboratory testing should only be required where insufficient experience is available.

C.I.6.1.1.2-1 Item (2) in Section C.I.6.1.1.2-1 requests "Provide the following information regarding the composition and compatibility of the core cooling water and

containment sprays and other processing fluids, as they relate to the materials of the ESF systems…" Please provide additional guidance with regard to "other processing fluids."

C.I.6.1.1.2-2 Item (3) in Section C.I.6.1.1.2 requests "Provide information to verify the compatibility of materials used in manufacturing engineering safety features (ESF) components with the ESF fluids." Item (4) then requests "Describe the process used to verify that ESF components and systems are cleaned in accordance with RG 1.37." If the processes used as described in Item (4) are sufficient, then request (3) seems to moot. What is the technical basis for item (3)?

C.I.6.1.1.2-3 Item (6) in Section C.I.6.1.1.2 requests "Provide information concerning the proposed approach to control the chemistry of the water used for the emergency core cooling system (ECCS) and containment spray solutions (CSS) and during the operation of the systems. Describe the methods and bases to evaluate the short-term compatibility (during the mixing process) and long-term compatibility of these sprays with all safety-related components within the containment." The first sentence refers to both ECCS and CSS, but the second only refers to sprays. Confirm the information requested in the second sentence does not apply to ECCS, but only CSS.

C.I.6.2-1 Section C.I.6.2 notes "CD acceptable" in a several places. Please clarify then intent of this notation. Does this imply that the information could be provided via CD outside the content of the final safety analysis report (FSAR)? Note that the FSAR is likely to be on CD.

C.I.6.2.1-1 Section C.I.6.2.1 requests "Describe how the basic functional design requirements for the containment meet general design criteria (GDCs) 4, 16, and 50 in Appendix A to 10 CFR Part 50 and 10 CFR 50.46." Please provide additional guidance on how 50.46 emergency core cooling system (ECCS) evaluation criteria should be related to containment design basis.

C.I.6.2.1.1-1 Item (1) in Section C.I.6.2.1.1 requests "Discuss the design bases for the containment to withstand a spectrum of loss-of-coolant accident (LOCA) and main steam line break accidents." Subitems (a) and (b) then request information regarding "the postulated accident conditions and the extent of simultaneous occurrences (e.g., seismic event…." This seems to imply that a simultaneous seismic event and LOCA should be evaluated for containment analysis. Please clarify/confirm that this is NOT the intent of these statements.

C.I.6.2.1.1-2 Item (2)(a) in Section C.I.6.2.1.1 requests "Describe the qualification tests proposed to demonstrate the functional capability of the structures, systems, and components in pressure-suppression-type containments and nonpressure-suppression type containments." Please provide additional guidance on the type of qualification testing that might be expected for nonpressure-suppression type containments.

C.I.6.2.1.1-3 Item (3)(a) in Section C.I.6.2.1.1 similarly states "Tabulate (and electronically provide) the results of each accident analyzed, as shown in Table 6-3 at the end of this section of DG-1145," and Item (3)(b) states "Provide tables (or transmit electronically)…." Please clarify then intent of these notations. Does the first note imply that the information should also be provided in some electronic format outside the content of the final safety analysis report (FSAR)? Does the second imply an option that the information could be provided in some electronic format outside the content of the FSAR? Note that the FSAR is likely to be "electronically provided" on CD.

C.I.6.2.1.1-4 Item (3)(b) in Section C.I.6.2.1.1 requests "Provide large-size plan and section drawings of the containment…." Provide clarification of how this is accomplished consistent with the electronic submittal guidance in Section IV.2.

C.I.6.2.1.3-1 Section C.I.6.2.1.3 requests the accident be described in four phases, including a new "refill phase." Please clarify the distinction between the "refill phase" and the "core reflood phase" and provide a regulatory basis for the change from RG 1.70.

C.I.6.2.1.4-1 Section C.I.6.2.1.4 refers to "electronically" providing information. Does the second imply that the information is expected to be provided in some electronic format outside the content of the final safety analysis report (FSAR)? Note that the FSAR is likely to be "electronically provided" on CD. Item (6) states "tabulate (and electronically provide)…." Does this latter note imply that the information should also be provided in some electronic format outside the content of the FSAR? Please clarify then intent of these notations.

C.I.6.2.2.2-1 Section C.I.6.2.2.2 states "Specify the time elapsed for the CHRS to be fully operational following postulated accidents." The rewording of this sentence is less clear than the wording in RG 1.70. It now seems to imply that the CHRS may not be fully operational at the time of the event and that some time could elapse before it becomes fully operational to respond to the event. Please clarify the intent of the rewording.

C.I.6.2.3.4-1 Section C.I.6.2.3.4 requests "Provide results of tests performed, as well as a detailed updated program. Subsequent test results should be provided as they become available." These tests won't be performed during the combined license (COL) application review. Does this imply that testing results should be included in the bi-annual periodic updates? If so, what is the regulatory basis for the information request?

C.I.6.2.4.4-1 Section C.I.6.2.4.4 requests "Provide the results of tests performed, as well as a detailed updated testing and inspection program." These tests won't be performed during the combined license (COL) application review. Does this imply that testing results should be included in the bi-annual periodic updates? If so, what is the regulatory basis for the information request?

C.I.6.2.5.4-1 Section C.I.6.2.5.4 requests "Provide the results of tests performed, as well as a detailed updated testing and inspection program." These tests won't be performed during the combined license (COL) application review. Does this imply that testing results should be included in the bi-annual periodic updates? If so, what is the regulatory basis for the information request?

C.I.6.3.2.2-1 Section C.I.6.3.2.2 requests "Describe provisions with respect to control circuits for motor-operated isolation valves in the ECCS, including consideration of inadvertent actuation prior to or during an accident" and C.I.6.3.2.5 requests "Identify the functional consequences of each possible single failure, including the effects of any single failure or operator error that causes any manually controlled electrically operated valve to move to a position that could adversely affect the ECCS." The industry understands these to include requests for failure modes and effects analysis (FMEA) considerations of operator error. Please confirm this understanding or clarify the request and its regulatory basis.

C.I.6.3.2.2-2 C.I.6.3.2.2 and 6.3.5 refer to IEEE Std 609. Should these references be to IEEE 603. If not, the 609 standard does not seem to be readily available. It is not available from the IEEE web site, nor in other typical standards purchasing locations. Please identify where this document can be obtained.

C.I.6.3.2.5-1 Section C.I.6.3.2.5 requests "Discuss how all potential passive failures of fluid systems, as well as single failures of active components, were considered for long-term cooling." Please clarify this request and provide its regulatory basis. Specifically, clarify that the passive failures are also considered on a single failure basis and not "all" together.

C.I.6.4-1 Section C.I.6.4-1 states "The control room is also the entire zone serviced by the control room ventilation system." However, the 1996 draft revision of SRP 6.4 Section I.1 states; "The zone serviced by the control room emergency ventilation system is examined to ascertain that all critical areas requiring access in the event of an accident are included within the zone (control room, kitchen, sanitary facilities, etc.) and to ensure that those areas not requiring access are generally excluded from the zone." This SRP description is preferred since it would allow for isolation of areas not serviced by the recirculation mode of the control room ventilation system. The site should have the opportunity to determine the control room habitability zone, provided it would be tested as appropriate. Alternatively, the statement in DG-1145 could be revised to read "The control room is also the entire zone serviced by the control room ventilation system when in the recirculation mode."

C.I.6.4.1-1 Item (4) in Section C.I.6.4.1 requires criteria for "food, water, medical supplies, and sanitary facilities". Although Regulatory Guide 1.70 requires this, standard review pland (SRP) 6.4 says nothing about food, water, or medical supplies. Please confirm that these supplies must only be available to control room personnel in an accessible area, but need not be stored in the control room.

C.I.6.4.5-1 Section C.I.6.4.5 requests "The application should also include results of any tests performed to support specification of the test program, as well as a detailed update of the program." There won't be any testing performed during the combined license (COL) application review. Does this imply that testing results should be included in the bi-annual periodic updates? If so, what is the regulatory basis for the information request?

C.I.6.5.5-1 Section C.I.6.5.5 provides guidance for suppression pool fission product cleanup evaluation. This seems inconsistent with the Regulatory Guide 1.183 Appendix A statement of "Reduction in airborne radioactivity in the containment by suppression pool scrubbing in BWRs should generally not be credited." However, it is recognized that the regulatory guide also says "However, the staff may consider such reduction on an individual case basis."

C.I.6.6.7-1 Section C.I.6.6.7 requests "Indicate whether the program for Class 2 system pressure testing will comply with the criteria in Article IWC-5000 of Section XI of the ASME Code. Also indicate the extent to which the program for Class 3 system pressure tests will comply with those criteria." Shouldn't the Class 3 pressure tests be compared to the IWD-5000 criteria?

C.I.7-1 This document frequently refers to IEEE Std 7-4.3.2-2003, “IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations.” 10 CFR 50.55a(h) requires protection systems to meet the requirements of IEEE Std 603-1991, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations." IEEE 603-1991 references IEEE 7-4.3.2-1982. Please Clarify the proper regulatory path to use the 2003 version and show compliance with the CFR requirements.

C.I.7-2 This document frequently refers to IEEE Std 7-4.3.2-2003, "IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations." 10 CFR 50.55a(h) requires protection systems to meet the requirements of IEEE Std 603-1991, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations." IEEE 603-1991 references IEEE 7-4.3.2-1982. Clarity is needed on the proper regulatory path to use the 2003 version and show compliance with the CFR requirements.

C.I.7-3 Section C.I.7 references IEEE 603-1991, 603-1998, and 603 with no revision date. While we endorse the concept of using the latest revisions of the various standards, consistency is needed within the document regarding the various standards.

C.I.7-4 DG-1145 references EPRI TR 102323 (page 4) - however, no revision is given. Industry would prefer revision 3 of the document be referenced for use in these applications. One example of why EPRI 102323, Rev. 3, should be used or be the basis for a revision to R.G. 1.180 Rev. 1 is Test CS-114 (conducted susceptibility). Experience in qualification testing of platforms and components

has shown that the CS-114 test levels are still particularly problematic and cause considerable effort to either justify why what the equipment meets is acceptable or to develop special filters. The established levels for this test were based on EPRI data collected in 1993-4, but the consensus of both the industry and NRC experts is that the data was applied incorrectly, resulting in overly conservative test levels. Rev. 3 of 102323 has corrected the test levels for this test. It also includes the justification for these revised levels.

C.I.7-5 Chapter 8 of DG-1145 references Regulatory Guide 1.180 directly; Chapter 7 references the EPRI TR. Inconsistency between chapters needs to be corrected.

C.I.7-6 Lightning is now grouped with other environmental factors in Chapter 7. This does not seem to be the right place for this guidance - seems to fit better under system integrity. It was not mentioned in the Chapter 8 guidance on environmental factors. Also, ANSI 665 is referenced in this section - we believe that IEEE 1050 should be referenced as well. Both of these are endorsed in RG 1.204. There should be consistency between Chapters 7 and 8 in this area.

C.I.7-7 Page 2 of Section C.I.7 states: "The adequacy of the software life cycle process implementation - A sample of verification and validation, safety analysis, and configuration management documentation for various life-cycle phases should be provided…" Should revise to "provide description of V&V process and have documentation available for audit and review."

C.I.7-8 NEI 04-04 was recently endorsed by NRC regarding cyber security programs. This document should be mentioned in the draft guide (DG) in terms of having a cyber security program that meets the guidance of 04-04 Needs to be in the appropriate section of the guidance. Also, Regulatory Guide 1.52 is referenced instead of 1.152 (typo).

C.I.7-9 How will the cyber security sections be reconciled with the ongoing Part 73 rulemaking? The use of Regulatory Guide 1.152 for Cyber Security is still problematic considering that all current and future platforms are commercial off-the-shelf (COTS). While these concepts can be applied to application development, the platform and platform software have long since been "developed". No current platform safety evaluation report (SER) addresses Regulatory Guide 1.152, R2. In addition, the staff should clarify reviews of cyber security issues beyond safety related items that will occur during the combined license (COL) process.

C.I.7-10 Several standards are referenced with no date revision noted. Are the referenced standards considered to be the latest ones published or the latest endorsed? Industry would prefer that the guidance make clear that the latest published standards should be utilized.

C.I.7-11 Item K in Section C.I.7 states in part, "…For computer-based system, configuration management plan should describe for maintaining the identification of computer software." This sentence does not appear to make sense and should be revised. Is this sentence trying to indicate that the configuration management plan should describe the mechanism(s) for maintaining identification?

C.I.7-12 Page 7, C.I.7.3 Evaluation of Conformance with IEEE Std 7-4.3.2 (Reference: SRP Chapter 7, Appendix 7.1-D) - the reference is to a new standard review plan (SRP) section that has not been made publicly available. As such, we are unable to comment on this section, and we understand that the SRP updates will not be available until March 2007. We believe it would be appropriate for the staff to publish this SRP section as soon as possible. In the case of brand new SRPs like this one, we recommend the staff issue the SRP in draft form ASAP. This will increase the likelihood that the SRP will be commonly understood when it is issued final in March of next year.

C.I.7-13 The industry understands that it must produce detailed documentation for all sections of Chapter 7. Since any of this material that was not completed during the Certification is covered under the DAC/ITAAC, this documentation is expected to be reviewed/approved by the licensee and held for audit by the NRC; it is not expected to be submitted to the NRC. The industry needs additional guidance on what the staff expects the applicant to actually submit for staff review/approval. Since all near term applications will reference certified designs (or soon to be certified designs), the staff should be clearly addressing the certified design as their highest priority.

C.I.7-14 In the whole discussion, RG's 1.168, 1.173, 1.172. 1.169, 1.170, 1.153 and Item A-19 (NUREG 0933) are notably absent as references. At least one of these RG's was "draft" but are nonetheless applicable to the design, configuration and testing of the SW and HW components. It may be that the reference is implied through other standards and documents but it isn't obvious. Clarification is needed on treatment of these guides.

C.I.7.1-1 Section C.I.7.1 discusses NRC Regulatory Guide (RG) 1.152, Revision 2, "Criteria for Use of Computers in Safety Systems of Nuclear Power Plants," as establishing the minimum functional and design requirements for computers used as components of a nuclear power generating plant safety systems. The revision level for IEEE 603 (1998) in the RG is different than the one cited in 10 CFR 50.55a(h). Also, the RG endorses IEEE 7.4.3.2-2003 whereas NRC staff has said to a licensee that 10 CFR 50.55a(h) does not explicitly allow its use without a relief request. Clarity is needed on the proper regulatory path for use of the later version of these technical documents such that relief requests are not needed in order to utilize the latest standards.

C.I.7.1-2 Section C.I.7.1, Review Process for Digital Instrumentation and Control Systems (Reference: SRP Chapter 7, Appendix 7.0-A), Item 3, Defense-in-depth and

diversity: Latest staff positions seem to indicate that the use of leak-before-break in analyses is not acceptable. Need clarification on how leak-before-break fits into the best estimate analysis. Also, we have been told in an earlier meeting that the staff is updating the BTP-19 diversity and defense-in-depth positions through a SECY paper. Please update us on the status of this work and the potential impact on BTP-19.

C.I.7.1-3 Section C.1.7.1 - It is recommended that clarification be added that some of the more detailed information in the list of 7 topics will be made available for NRC review rather than required to be submitted. Items 6 & 7 are examples. Note that the current corresponding SRP section uses the word "reviewed" rather than "provided".

C.I.7.1-4 Paragraph 5 and 7 on page two in Section C.I.7.1 , the staff may want to consider segregating the platform from the application with regards to lifecycle planning and include both hardware and software. The platform (hardware host, Operating System and built in libraries, application building environment) has a distinctly different lifecycle and different management requirements than does the application (feed water, turbine control, reactor trip, etc). Segregation will also allow these two items to be managed independently and for regulations to be applied independently. For instance, we will not want to apply BTP 7-14 to the platform components directly if possible. Software development output should address the application vs. the platform. The platforms interaction with the application would be specified and validated in various V&V processes.

C.I.7.1-5 It is recommended that clarification be added that some of the more detailed information in the list of 7 topics will be made available for NRC review rather than submitted. Items 6 & 7 are examples. Note that the current corresponding SRP section uses the word “reviewed” rather than “provided”.

C.I.7.1-6 Section C.I.7.1, Review Process for Digital Instrumentation and Control Systems, discusses the defense-in-depth and diversity (D3) analysis. Clarification is needed on how leak-before-break fits into the best estimate analyses used the D3 work.

C.I.7.1-7 Section C.I.7.1 discusses NRC Regulatory Guide (RG) 1.152, Revision 2, “Criteria for Use of Computers in Safety Systems of Nuclear Power Plants,” as establishing the minimum functional and design requirements for computers used as components of a nuclear power generating plant safety systems. The revision level for IEEE 603 in the RG is different than the one cited in 10 CFR 50.55a. Also, the RG endorses IEEE 7.4.3.2-2003 whereas NRC has said to a licensee (Oconee) that 10 CFR 50.55a does not explicitly allow use without a relief request. Clarity is needed on the proper regulatory path for use of the later version of these technical documents. IEEE 603-1991 references IEEE 7.4.3.2-1982. RG 1.1.52 endorses IEEE 7.4.3.2-2003. And, this document references IEEE 603-1998, which references IEEE 7.4.3.2-1993. Clarity is needed on the proper regulatory path to use the latest versions and still show compliance with

the CFR requirements.

C.I.7.2-1 EMI/RFI: C.1.7.2.D - need to identify specific standards that are considered acceptable in designing the system to minimize EMI/RFI. Only general guidance is given, except for testing guidance where EPRI TR-102323 is referenced.

C.I.7.2-2 RG 1.204 is referenced in DG-1145 Chapter 8; Chapter 7 (C.1.7.2.D) references NFPA 78. Difference between chapters should be reconciled.

C.I.7.2-3 System integrity section (C.I.7.2.E) - section is written such that the preferred method is for the Reactor Trip System to fail in a tripped state. While we agree that the RTS safe position is normally the tripped state, we believe that the ESFAS wording: "…should fail to a pre-defined state. For many ESFAS functions this predefined safe state will be that the actuated component remains as-is." or the GDC-23 wording: "The protection system shall be designed to fail into a safe state or into a state demonstrated to be acceptable on some other defined basis…" would be more appropriate.

C.I.7.2-4 Section C.I.7.2.G - capability for test and calibration - states: "Any failure that is not detectable must be considered concurrently with any random postulated, detectable, single failure." IEEE 338 does not contain this language. Suggest removing both the second and third sentences.

C.I.7.2-5 Next to last sentence in Section C.I.7.2.G says, "Test procedures that require disconnecting wires, installing jumpers, or other similar modifications of the installed equipment are not acceptable test procedures for use during power operation." This a new requirement that does not have an adequate technical basis. Although this may be a preference, no standard requires this. Suggest removing this language.

C.I.7.2-6 C.I.7.2.G: The staff should clarify what credit they are allowing for automated self-testing. We recognize that this depends on the test coverage provided within the platform. However, the staff has approved three standard platforms, so this guidance should be able to be provided with reference to these pre-approved platforms (or for other platforms that will be pre-approved in the future).

C.I.7.2-7 C.I.7.2.H: Additional guidance is needed on the qualification requirements for HSI to support manual actions. Manual actions credited in the safety analysis for accident mitigation are clearly covered by 603 and must meet the same requirements as for the RPS/ESFAS. But what about longer term actions (e. g. achieving hot shutdown, achieving cold shutdown)? What about HSI for safety related support systems such as electrical, cooling water and HVAC? These safety related aux systems typically run in auto with no manual intervention required. Historically their HSI was Class 1E, but this was for design convenience. Is Class 1E HSI still required just because the system performs a safety function?

C.I.7.2-8 C.I.7.2 paragraph H, Last sentence should be changed to ….describe a method for maintaining….

C.I.7.2-9 C.I.7.2 paragraph M, RG 1152 security requirements are still untenable. Consideration should be given here to proposing a criteria for platform reliability apart from RG-1.152 and IEEE 7-4.3.2.

C.I.7.2-10 C.I.7.2 page 6. There should be a heading between "M. Reliability" and "A. Automatic Control" or the paragraph numbering should continue with "N".

C.I.7.2-11 C.I.7.2 paragraph C, The discussion of IEEE 7-4.3.2 has the section numbers confused. These need to be corrected.

C.I.7.2-13 C.I.7.2 paragraph G, Last sentence should be removed. We are not likely to be able to craft periodic tests for "data errors" and "deadlocks". Separate guidance in the design process will drive mitigation of these items. If a digital or computer related statement is desired here by the NRC, additional thought should be given and more valid requirements stated

C.I.7.2-14 Section C.1.7.2 - L there is a passing reference to Chapter 18. This may be adequate as long as Chapter 18 embraces the same RG's and standards for software configuration control and testing requirements. However, RGs and standards are notably absent from Chapter 18. System displays and the software that governs their construction and operation are integral to the software life cycle process.

C.I.7.2.1-1 In Section C.1.7.2.1, "System Description" should be numbered C.1.7.2.1.1 VERSUS C.1.7.2.1

C.I.7.3-1 C.I.7.3.M: The staff requires reliability analysis to include software. This is a change from previous NRC policy which accepted that the unreliability contribution of software is insignificant in an overall system reliability analysis, as long as that software was developed in accordance with 10CFR50 Appendix B and 7-4.3.2. Therefore, there should be no need for an additional software reliability analyses.

C.I.7.3-2 C.I.7.3 paragraph F: The extra requirements beyond IEEE 603 should be left to other documents as this will lead to conflicts later.

C.I.7.3-3 C.I.7.3 paragraph M: Needs clarification as to the relationships of the various documents cited and the statement "Software error recording and trending maybe used in combination…." What does that mean?

C.I.7.5.1-1 Page 16, C.I.7.5.1 - scopes in the Emergency Response Facility instrumentation into "Safety Related Display Instrumentation"- this does not appear to be consistent with the referenced SRP section. Seems to be more appropriate in C.I.7.9.

C.I.7.6-1 C.I.7.6: The 1997 version of the SRP defines the scope of interlock systems as follows:

- o Interlocks to prevent overpressurization of low pressure systems - See BTP HICB-1.
- o Interlocks to prevent overpressure of the primary coolant system during low-temperature operations of the reactor vessel - See BTP RSB 5-2.
- o Interlocks for ECCS accumulator valves - See BTP HICB-2.
- o Interlocks required to isolate safety systems from non-safety systems
- o Interlocks required to preclude inadvertent inter-ties between redundant or diverse safety systems.

DG 1145 C.I.7.6.2 specifies:

- o Analyses should include, but not be limited to, consideration of instrumentation installed to prevent or mitigate the consequences of:
  - o Cold water slug injections,
  - o Refueling accidents,
  - o Over-pressurization of low-pressure systems, and
  - o Fires

Although introductory paragraph in the draft regulatory guide does list the same areas as the SRP noted above, except for over-pressurization, the remainder of the items in the regulatory guide list appear to be new guidance.

C.I.7.7-1 C.I.7.7: Due to the segmented nature of analog systems, control system failures are typically considered one at a time in the plant's safety analysis (e. g. loss of feedwater is considered independently of inadvertent rod withdrawal). But as control systems are integrated together, the potential for multiple concurrent events may increase. The staff should provide guidance for redundancy and failure requirements within integrated control systems that allows the current single event analysis strategy to be maintained.

C.I.8-1 First sentence states electric power system is source of power to reactor coolant pumps and other auxiliaries. RCPs are a PWR specific design item, thus the sentence should be revised to be more generic; e.g. "...source of power for station auxiliaries and for the protection system..."

C.I.8.1-1 Introduction states the need to show compliance with various regulations and standards (e.g. Reg Guides, GLs). This is a similar requirement to section 1.9 of the DG. Should this discussion be a duplicate of section 1.9 information, or should 1.9 refer to this section?

C.I.8.1.-2 Introduction refers to AAC as part of station blackout (SBO) response. Not all plant designs will need an AAC, thus this sentence should be revised, e.g.; "... the onsite electric system should be described briefly in general terms, and a brief description provided for station blackout mitigation, and the associated ..."

C.I.8.1-3 Introduction discusses systems "important to safety"; What is the scope of this group? Can a more specific definition be provided?

C.I.8.1-4 Regulatory Guide 1.6 is applicable to safety related / 1E onsite power sources (e.g. safety related diesel-generators); This regulatory guide will not be applicable to passive plant designs such as AP-1000/ESBWR

C.I.8.1-5 Reg Guides 1.29 & 1.100 on seismic issues, Regulatory Gudie (RG) 1.108 for EDG testing and RG 1.62 for manual initiation were originally listed in RG 1.70 for chapter 8, but they are not listed here; Were they dropped intentionally?

C.I.8.1-6 Regulatory Guide 1.153 is called out in the body of section 8, and IEEE 603 is listed in this section; Need to add 1.153 to list of Reg Guides.

C.I.8.1-7 RegulatoryGuide 204 should be 1.204 for Lightning Protection.

C.I.8.1-8 Branch technical position (BTP) ICSB 2 & 8, as well as GL77-07, 79-17, 84-15, and 94-01 should only apply to safety related diesel generators (1E).

C.I.8.1-9 Generic Letter 2006-02 solicited industry input on grid reliability issues. Requirements / guidance from the NRC on this issue has not been finalized in this area, thus this should not be included in this section.

C.I.8.1-10 Listing of IEEE Standards separately from the Reg. Guide may lead to some difficulties. If a newer revision of a standard is called out in the DG, the applicant may be required to provide a "gap analysis" against a Reg. Guide justifying the use of the newer standard. Revise Reg. Guides to reflect newer standards acceptable to the NRC.

C.I.8.1-11 IEEE 946 standard for design of DC systems may be applicable, but we believe that a regulatory guide has not endorsed this standard. The list of IEEE standards does not list all standards endorsed by the Reg. Guides e.g. RG 1.158 endorses IEEE 535-1986 which is not listed. Was this an oversight? We need clarification of the intent of listing IEEE Standards in this section. It seems redundant to require a description of conformance to all IEEE Standards endorsed by the Reg Guides, since they would be addressed as part of conformance to the Reg. Guide.

C.I.8.2.1-1 Description states "…offsite power is preferred source of power for the protection system…"; This discussion needs to be re-worded to be more generic, e.g.;

" The offsite power system MAY BE the preferred source…"
"If required to meet general design criteria (GDC) 17, then two or more physically independent…"

C.I.8.2.1-2 Section should require a failure modes and effect analysis (FMEA) for the switchyard. This requirement should only apply to sites that must comply with GDC 17 (i.e. exclude passive plants). The FMEA may not be complete at time of

combined license (COL) application submittal.

C.I.8.2.1.2-1 These sections require a significant amount of detail on the offsite transmission system, much of which appears to be predicated upon the GDC 17 requirement for two physically independent circuits. For combined license (COL) applications that reference a design control document (DCD) for a design which has been granted an exemption to the requirement for two offsite sources, what is the required subset of information on the transmission system that is required , and what is the basis for the requirement for that information?

C.I.8.3.1.1-1 The requirement to discuss how Regulatory Guide 1.75 recommendations are met is redundant to section 8.1 requirements. Should only have to do once. Same comment applies to pg C.I.8-14 for DC cables. This comment applies to two entire paragraphs on each section, and not just the sentence containing Regulatory Guide 1.75.

C.I.8.3.1.1-2 System Capacity & Capability section discusses suitability of diesel generators for standby power source. Not all plant designs utilize diesels, thus the wording should be more generic, e.g.; "…suitability of the standby power sources to ensure sufficient…"

C.I.8.3.1.1-3 What is meant by "complete form"? What level of detail is required?

C.I.8.3.1.3-1 Is it necessary to provide software titles? Codes may change over life of plant; "Electronic models" of software are not typically submitted to the NRC as a part of the application. Models will be available for inspection by NRC. Comment also applies to DC sections.

C.I.8.3.1.3-2 a. Section 4 for Equipment Protection is assumed to only apply to safety-related equipment.
b. Does this section cover "associated circuit analysis" type issues that are required by the Fire Protection plan?

C.I.8.3.1.3-3 Section 6 on Power Quality does not specify any industry guidance (e.g. IEEE 519, RG 1.180); What parameters are a concern, e.g. frequency, voltage, harmonic content (THD)? What acceptance criteria for VFDs are a concern (THD, notch depth)? (same comment for DC section)

C.I.8.3.2.1-1 Section 4 requires battery characteristic curves; this appears to be a level of detail that would not be available for a combined license (COL) application.

C.I.8.3.2.2-1 Section refers to Regulatory Guide 1.9 which is applicable to diesel generators.

Should this be here?

C.I.8.3.2.2-2 Section 6 calls out 125 & 250 VDC batteries; New plant designs may not use these voltage ratings, thus the statement should be more generic.

C.I.8.3.2.2-3 Section 7 on grounding should NOT refer to 8.3.1.2. DC systems are typically ungrounded, so what should be discussed is:
- grounded or ungrounded
- ground detection system
- load grounding
- referenced consensus standards

C.I.8.4.1-1 The level of detail for training and procedure discussion should be the same as accepted by the NRC for section 13.5, i.e. functional description of required operator actions vs. detailed procedures.

C.I.8.4.1-2 Local power sources and transmission paths for re-supply may be under the control of a Transmission System Operator (TSO) that is independent of the licensee. This information may not be available at the time of combined license (COL) application submittal.

C.I.8.4.1-3 Some confusion between the draft regulatory guidance and Regulatory Guide 1.155 and 10 CFR 50.63. The words that are in the draft regulatory guidance are paraphrased out of 1.155 and 10CFR50.63, but it's not presented in a logical manner. The key items of this section per Regulatory Guide 1.155 and NUMARC 87-00:

-What is the required station blackout (SBO) coping duration? Provide analysis based upon NUMARC 87-00 guidance for determining coping duration-

-Does the plant utilize an ac independent approach, or alternate ac (AAC) approach (per Section 7.1.1 of NUMARC 87-00) for demonstrating capability to cope for the period of the coping duration? If ac independent, provide results of the analyses that demonstrate that parameters identified in Section 7 of NUMARC 87-00 are addressed. (can spell out the parameters from NUMARC 87-00 if want). Provide a functional description of any extraordinary operating procedures.

-If coping utilizes alternate alternating current (AAC), provide functional description of procedure and time required to establish AAC. If time required is greater than 10 minutes, provide analyses that parameters identified in Section 7 of NUMARC 87-00 are addressed for the first hour of the station blackout (SBO) event.

C.I.8.4.2-1 Last sentence on passive system designs should be moved to the beginning of this section. More general discussion about passive plants should also be included in other applicable sections (e.g. Offsite & Onsite AC requirements not all applicable to passive designs).

C.I.9.1.2-1 The last sentence in Section C.I.9.1.2, "Spent Fuel Storage" requires a description of the "design features and or controls for density of spent fuel assembly storage to address the potential for zircaloy cladding ignition of recently discharged fuel in the case of a spent fuel pool draining event. This event is not a design basis event for any of the designs currently anticipated to be referenced in combined license (COL) applications. What is the regulatory basis for including this requirement in a COL application?

C.I.9.5-1 Sections C.I.9.5.4, C.I.9.5.5, C.I.9.5.6, C.I.9.5.7, and C.I. 9.5.8, Diesel Generator Auxiliary Systems, should address the case for designs that do not rely on diesel generators for safety-related functions. An introductory sentence that states that the sections are only applicable for designs that incorporate safety-related diesel generators would clarify the guidance.

C.I.9.5.1.3-1 Section C.I.9.5.1.3, "Safety Evaluation". The last sentence before the two bullets states that the analyses described in the two bullets should be provided, as a minimum. (emphasis added). The second bullet states, "When provided, a summary description of the design specific fire probabilistic risk assessment (PRA) that uses ----". The effect of the two sentences makes it unclear as to whether a fire PRA is required. The risk information required to address fire hazards is not yet resolved. It is recommended that the information requirements related to fire risk be addressed in Section C.II.1 of the guidance and that the second bullet be deleted.

C.I.9.5.2-1 Sections C.I.9.5.2.1 and C.I.9.5.2.2.require information to be provided related to the Security Communications System. Since much of this information may be treated as Safeguards information, it is recommended that it be addressed as part of the Security Program in Section C.I.13.

C.I.14.3.5-1 Item (1) of section 14.3.5, ITAAC for Instrumentation and Controls, and section C.I.7 need to be in sync on revision levels and design criteria to avoid confusion during inspection, test, analyses, acceptance criteria (ITAAC) inspections. DG-1145 section C.I.7 bases all I&C guidance on IEEE 603-1998.

C.I.14.3.5-2 Item (2) of section 14.3.5 and section C.I.7 need to be in sync to avoid confusion during ITAAC inspections. Note that DG-1145 section C.I.7 bases all software guidance on IEEE 7-4.3.2-2003.

C.I.18-1 C.I.18 states that "by the time of combined license (COL) application submittal the first 11 elements should be complete" (p.2). This is infeasible, and it conflicts with prior understandings between industry and NRC.

C.I.18-2 Of the 12 elements, those not completed in Design Certification are covered by design acceptance criteria (DAC)/ inspection, test, analyses, and acceptance criteria (ITAAC). Detailed documentation of the activities fulfilling DAC/ITAAC will not be submitted to NRC, but will be held for NRC inspection. The guidance should reflect the distinction between safety review of licensing submittals and NRC inspection of design implementation.

C.I.18-3 C.I.18 should cite applicable documents as needed, and should not repeat, paraphrase, or revise available guidance.

C.I.18-4 C.I.18 should not be used to extend NUREG-0711 guidance for Ch.18 content, scope, or analysis such as:

a. Defining individual roles in OER for all similar predecessor plants(C.I.18.2.2.2)
b. Treatment of new technologies as OER issues (C.I.18.2.2.2, .2.2.4)
c. Verification of the functional requirements analysis (C.I.18.3.2.1)
d. Verification of the function allocation... "to show that the allocations of functions result in a coherent role for plant personnel" (C.I.18.3.2.2)
e. HRA activities in excess of PRA requirements and risk-important human actions (C.I.18.6)
f. Identifying how HSI characteristics will minimize fatigue (C.I.18.7.2.5)

C.I.18-5 Alternative design concepts (C.I.18.7.2.4) are not appropriate in the FSAR, and if developed, they would not be described in the final safety analysis report (FSAR). In general, much of the specific material and level of detail called for in C.I.18 is excessive and would not be contained or referenced in an FSAR, but would be held available for NRC audit.

C.I.18-6 The term "minimum inventory" is used with two different meanings. In C.I.18.4.2 it is an outcome of Task Analysis, which implies it is the total set of human system interface (HSI) required for all analyzed tasks. In C.I.18.7.3.2 it refers to fixed position HSI required to support plant safety, which implies it is a subset of the total set of HSI. The staff should clarify the distinction.

C.I.19-1 The last sentence in the last paragraph in Section C.I.19 Probabilistic Risk Assessment and Severe Accidents, states, "Chapter 19 should reference the applicable analyses and evaluations and the necessary supporting information to demonstrate compliance with the above requirements and Commission policies."

Please clarify the use of the language "should reference." We assume that a summary description of supporting information is an acceptable alternative to including all references.

C.I.19-2 In Sections C.I.19.2.3 and C.I.19.2.4 the language, "Identify important SSCs and operator actions (considering both failures and reliabilities)," is used in several subsections.
Please clarify the meaning of the word "reliabilities" in the above language.

C.I.19.2.2.2-1 Section C.I.19.2.2.2 includes a discussion of design, combined license (COL) application, construction and operational phases.

We assume the intent is for the combined license (COL) applicant to describe at a summary level planned uses of probabilistic risk assessment (PRA) for the phases which occur after COL application (i.e., for the construction and operational phases.)

Please clarify the intent of the language in this section.

C.I.19.2.2.3.1-1 C.I.19.2.2.3.1 Use of probabilistic risk assessment (PRA) in Support of Licensee Programs provides, "Describe use of the PRA in the construction phase and specifically its use in support of other licensee programs (e.g., maintenance rule, construction inspection, interface with the reactor oversight program, human factors program).

We recommend deleting the example "construction inspection" as the construction inspection program is not a licensee program. Use of PRA to support the NRC's CIP is discussed in IMC-2503.

C.I.19.2.5-1 Section C.19.2.5, summary of Overall Plant Risk Results and Insights includes, "This section should provide the overall results and insights from the plant-specific PRA. In particular, identify the plant features, including non-safety related systems, and operator actions that are important to reducing risk and confirm that the expectation stated in 10 CFR 52.79(a) (2) is met. Include a PRA-based insights table that identifies the PRA-based insights that ensure the assumptions and plant operational features addressed in the PRA will remain valid in the as-built, as-to-be-operated plant."

We assume that the "PRA-based insights" table in this last sentence refers to "plant features" which is included in the second sentence, and that the text and tabulation would be a summary. Please clarify.

C.I.19.4.1-1 19.4.1 Description of PRA Maintenance and Update Program: The second paragraph in this section states, "Describe how the applicant ensures the PRA maintains the appropriate scope, level of detail, and technical adequacy consistent with its uses and consistent with the prevailing PRA standards, guidance, and good practices."

This section addresses the entire operating lifetime of the plant, in addition to design, combined license (COL) application and construction phases. The use and appropriateness of standards and guidance will change during the above phases. Therefore, we recommend that the language "consistent with the prevailing PRA standards, guidance, and good practices" be replaced by

"consistent with the prevailing PRA standards, guidance, and good practices, as needed to support use of the PRA", and include a provision to reference an NRC review of the PRA as an alternative to explicitly addressing this language.

C.I.19.4.1-2 19.4.1 Description of PRA Maintenance and Update Program: The last paragraph states, "Identify how the plant-specific PRA is maintained up-to-date by including the projected frequency of updates of the plant-specific PRA to meet existing standards that will be reflected in revisions to the FSAR (e.g., the PRA will be updated to reflect plant, operational, and PRA modeling changes, consistent with NRC-endorsed standards in existence 1 year prior to issuance of the update, which will be every other fuel cycle, not to exceed 5 years)."

As noted above, this section addresses the entire operating lifetime of the plant, in addition to design, combined license (COL) application and construction phases. The use and appropriateness of standards and guidance will change during the above phases. We recommend the language, "(e.g., the PRA will be updated to reflect plant, operational, and PRA modeling changes, consistent with NRC-endorsed standards in existence 1 year prior to issuance of the update, which will be every other fuel cycle, not to exceed 5 years)" either be deleted, as it is unnecessary, or be replaced with "(e.g., the PRA will be updated to reflect plant, operational, and PRA modeling changes, consistent with PRA practices and NRC-endorsed standards, as needed to support use of the PRA, prior to issuance of the update, which will be every other fuel cycle, not to exceed 5 years)."

C.I.19.4.2-1 19.4.2 Description of Significant Plant, Operational, and Modeling Changes: This section includes a discussion of design, combined license (COL) application, construction and operational phases.

We assume the intent is for the COL applicant to describe at a summary level planned uses of probabilistic risk assessment (PRA) for the phases which occur after COL application (i.e., for the construction and operational phases.) Note that this section appears to address the entire operating lifetime of the plant, in addition to design, COL application and construction phases. See, for example, Section "19.4.2.N Nth Operational Phase Changes." Therefore this section extends beyond COL application and issuance.

Please clarify the intent of the language in this section.

C.I.19.4.2.3-1 19.4.2.3 Construction Phase Changes: This section states that "The plant-specific PRA should reflect the plant as it was constructed and in preparation for operations."

Any update of the plant-specific PRA, as necessary and appropriate, will lag the actual status of the plant, as time is required to complete and document the evaluation. Therefore, we recommend that this sentence be replaced with "The plant-specific PRA should reasonably reflect the plant as it is to be constructed and in preparation for

operations."

C.II.2-1 Section C.II.2, Attachment A - ITAAC General Development Guidance: Instrumentation and Control Systems, refers to compliance with 10 CFR 50.55a(h), Criteria for Protection Systems for Nuclear Generating Stations, and IEEE Standard 603-1991 (and the correction sheet dated January 30, 1995). DG-1145 section C.I.7 bases all guidance on IEEE 603-1998. These two sections need to be in sync to avoid confusion during ITAAC inspections.

C.II.2-2 Section C.II.2, Attachment A, refers to SRP Chapter 7, BTP 7-14 for software quality design controls. It does not mention IEEE 7-4.3.2-2003. DG-1145 section C.I.7 includes software quality guidance based on on IEEE 7-4.3.2-2003. These two sections need to be in sync to avoid confusion during ITAAC inspections.

C.II.2-3 Section C.II.2, Attachment A, specifies verification of each of the many functional characteristics listed in the document. A sampling process would make sense here. Otherwise, the 'each' term can be interpreted as a requirement to review 100% of the software code to determine that each characteristic was addressed for all cases.

C.III-1 C.I addresses a COL application that references neither a DC or ESP. C.III.1 addresses a COL application that references a DC only. C.III.2 addresses a COL application that references both a DC and an ESP. However, there is no similar section that addresses a COL application that references only an ESP. Why was this possible scenario omitted?

C.III.1-1 Please confirm our understanding that COL applicants referencing a design certification should focus solely on C.III.1 (or C.III.2 if an ESP is also referenced), and not on the Part 1 guidance.

C.III.1-2 What is the intent of paragraph 2 of Section C.III.1.2 and sentence two of Section C.III.1.10?

C.III.1-3 a) Where does DG-1145 discuss the acceptability of incorporating by reference the DCD into the COL application? We suggest that IBR could be discussed in Section C.III.1.8 in conjunction with the guidance about "facilitating" NRC staff review. b) Apart from IBR, please clarify what is meant by the staff recommendation that the COL application "facilitate" the staff review wherever possible.

C.III.1.1.5-1 COL Action/Information Items are not treated consistently. In Section C.III.1.1.5, the need to provide construction schedule info - a COL Item common to all DCDs - is identified. There are common COL items in Chapter 4 of DCDs, but these are not identified in C.III.1.4. We think it would be useful to identify common/generic COL items (like the construction schedule item) in Section C.III.1.

C.III.1.9.1-1 Section C.III.1.9.1 notes that the COL applicant (referencing a certified design) should address compliance with regulatory guides with the purpose of indicating if methods found acceptable to the NRC staff for implementing principal design criteria (of Appendix A to Part 50) are met. It is understood that DG-1145 itself is a unique regulatory guide which addresses content of the application rather than specific methods for compliance to principal design criteria. Therefore, the COL application would not be expected to contain a compliance evaluation for DG-1145. Rather, the COL application FSAR Chapter 1 would provide a statement that the appropriate portion of DG-1145 was used in defining and developing the content of the COL appilcation FSAR. For example, an application referencing both a certified design and early site permit would state in FSAR Chapter 1 that the FSAR complies with DG-1145 Section C.III.2 regarding content. Any significant departures from Section C.III.2 would be described and justified, as needed.

This approach should be clarified in DG-1145 Sections C.I.1, C.III.1, and C.III.2.

C.III.1.19-1 Section C.III.1 - Information Needed for a COL Application Referencing a Certified Design, 19.1 Plant-Specific PRA states, in the second paragraph, last two sentences "The COL applicant may use, or incorporate by reference, the PRA for the Certified Design. However, the COL applicant should ensure the provided information is current, complete and accurate relative to plant-specific, site specific conditions and parameters. The applicant should identify and resolve the COL Action Items applicable to the PRA for the Certified Design."

We assume that "re-submittal" of the PRA for the Certified Design would not be needed. Please clarify.

C.III.1.19-2 Section C.III.1 - Information Needed for a COL Application Referencing a Certified Design, Section C.II.1, Probabilistic Risk Assessment states, "The applicant should adhere to the guidance provided in Section C.II.1 of this guide for the plant-specific PRA. In cases where it can be shown that assumptions in the Certified Design PRA bound certain site-specific or plant-specific parameters (or it can be shown that any differences have no significant impact on the PRA results and insights), indicate "No change from the certified design PRA" in the appropriate section. The same is true for any changes or deviations from the Certified Design, as long as it can be shown that they do not have a significant impact on the PRA results and insights."

Clarification is needed, as noted below.

We assume that 1) the certified design PRA would not need to be "re-submitted," and 2) that rather than providing language that "No change from the certified design PRA" in the appropriate section" that language could be, instead, included where there are changes, and that sections containing no changes could be discussed collectively in one section/paragraph.

For the language, "The same is true for any changes or deviations from the Certified Design, as long as it can be shown that they do not have a significant impact on the PRA results and insights," we assume that such changes can be provided in a summary (either in a summary PRA report or in Chapter 19.) There is no need to submit a detailed PRA report on a plant-specific basis when any differences are not significant.

C.III.1.19-3 Section C.III.1 - Information Needed for a COL Application Referencing a Certified Design, Risk Insights states, "During plant construction, the COL applicant should consider as-built information to acquire updated insights to strengthen programs and activities in areas such as training, emergency operating procedures development, reliability assurance, and maintenance. As plant operational data is accumulated, the licensee should update assumptions and analyses (e.g., assumed human errors; structures, systems, and component failure rates) and incorporate updated safety insights into quality assurance and operational programs."

Portions of this paragraph should be deleted as redundant to (COL) application sections which address the noted areas (e.g., EOPs, training, RAP, and Maintenance.) In addition, the paragraph addresses plant operations which extends beyond COL issuance or initial operations, and should be modified accordingly.

C.III.1.19-4 Section C.III.1 - Information Needed for a combined license (COL) Application Referencing a Certified Design, Format and Content, states that "COL applicants should adhere to the format and content identified in Appendix B to Section C.II.1 of this guide for the plant-specific PRA."
This language needs clarification. For a COL applicant referencing a certified design a "re-submittal" of the PRA, with a discussion of any departures or site specific considerations is not needed. Instead, a summary of any differences and their impact is appropriate. The language in this draft should be modified to more clearly discuss the expectation.

C.III.2-1 Last sentence of 1st paragraph should say "…and an ESP." "[A]nd an ESP" should also be added to the last sentence of this section.

C.III.2.1-1 Why does C.III.2.1 repeat rather than refer to C.III.1 where appropriate? Note - some adjustments to C.III.1 language (e.g, C.III.2.1.8) would be needed

C.III.2.1.8-1 Section C.III.2.1.8 (and/or C.III.2.5) should discuss/acknowledge the PPE approach.

C.III.2.2-1 In C.III.2.2, several sections say no additional info is needed, while others say to revise early site permit (ESP) info if there are any known significant changes to ESP info. The need to update ESP info when there is significant new info is a

given and applies to all site characteristic info approved in the ESP, not just the sections where DG-1145 says to revise ESP if needed. Why does DG-1145 treat some sections differently in this regard from others?

C.III.2.2 -2 The last sentence of the first paragraph in Section C.III.2.2 reads "For design topics that have been resolved in the design certification, the guide will state that the COL applicant does not need to include additional information." This sentence should be followed by a sentence which reads similar to, "For siting topics that have been resolved in the early site permit, the guide will state that the COL applicant does not need to include additional information." In general, C.III.2 subsections need to be modified from their analogues in Section C.III.1 to address ESPs.

C.III.5.1-1 The first paragraph of section C.III.5.1, Detailed Design Information and the Combined Operating License Application, contains a number of 'shoulds' and 'recommends' to "help avoid potential impacts on the combined operating licensee's plans and schedules for loading fuel." Flexibility needs to be maintained such that if the COL is being banked for a later construction start, the DAC approach can be maintained. The concomitant risk to plans and schedules would be assumed by the licensee.

C.III.5.1-2 In the second to last paragraph in section C.III.5.1, NRC discusses the design-centered review approach (RIS 2006-06) and notes that deviations to standardization may challenge this proposed "one issue, one review, one position" approach. Because of the rate of I&C technology change over the licensed life of either the design certification (DC) or combined license (COL), a second wave of orders for a given design after several years may involve later technology and require further review by the NRC staff. At that time, we would expect the staff to again apply the "one issue, one review, one position" approach.

C.III.5.1-3 The first paragraph states that sufficient as-built and as-procured information to address design acceptance criteria (DAC) should be available at the time of the combined license (COL) application submittal, or shortly after and that this detailed design information should be submitted during the COL application phase. This implies an unrealistic expectation of the level of detail of information available at the time of submitting the application. Further, in some design areas, as-built and as-procured information may not be available until after the COL review is completed. It should not be expected that applicants procure I&C equipment, valves, etc. prior to receipt of the COL. As-built information may not be available until the construction phase; which is authorized by the COL. One further comment is that the term "shortly after" is too vague. Based on these concerns, it is recommended that the first two sentences of this paragraph be deleted.

C.III.5.1-4 The first paragraph indicates that information to address design acceptance criteria (DAC) should be submitted during the combined license (COL)

application phase. This implies that the information needed to address DAC needs to be submitted to the NRC. However, it is expected that much of this information will be more detailed and lengthy than would be appropriate for inclusion in a final safety analysis report (FSAR). It is recommended that clarification be added that it is acceptable to make the information needed to address DAC available for NRC review and inspection at a site identified by the applicant.

C.III.5.1-5 It is recommended that a statement be added indicating that for design acceptance criteria (DAC) information not available at the time of the application (or during the application review) it is acceptable for the applicant to provide a schedule for completion of detailed engineering, procurement, fabrication, installation, and testing. This will support timely NRC inspection of DAC information.

C.III.5.1.1-1 Item 2 in section C.III.5.1.1, Information Necessary to Verify Completion of Instrumentation and Control Design, lists the description of the implementation process for both hardware and software of I&C system life cycle design processes (stages) in the combined license (COL) application. Is it necessary to repeat information if the design process controls are fully described in the design certification (DC)?

C.III.5.1.1-2 Item 3 in section C.III.5.1.1, calls for the reference software design documents related to the I&C design process planning documents from the referenced certified design. Is it necessary to resubmit this information if it was provided for the design certification (DC)?

C.III.5.1.1-3 It is recommended that clarification be added that the information to address design acceptance criteria (DAC) may be made available for inspection rather than submitted. Many of the 18 information items listed are more suitable for inspection than submittal.

C.III.5.1.1-4 Section C.III.5.1.1 subsection 10, Repair Provision: This section does not contain any guidance for addressing diagnostic systems for digital I&C systems. Guidance is requested in this area.