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To: <NRCREP@nrc.gov>
Date: Wed, Oct 11, 2006 5:08 PM
Subject: Comments on DG-1145 Chapters 14 and 15

NRC;
Attached are my comments on DG-1145 Chapters 14 and 15.
Regards;
Kurt T. Schaefer
A&K Nuclear Licensing Inc.
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Comments on DG-1145 Chapters 14 and 15

Comment on DG-1145, C.I.14 and C.III Section 14.3

C.I.14.3, 1st paragraph states "the COL applicant should provide its proposed *(ITAAC)* selection methodology and criteria for establishing the ITAAC that are necessary and sufficient to provide that reasonable assurance." C.III, Section 14.3, 1st paragraph states "COL applicants that reference a certified design should use the *(ITAAC)* selection methodology provided in Section 14.3 of the DCD for the certified design and supplement it, as necessary, for site-specific selection criteria." However, the ITAAC selection methodology in the ABWR/ESBWR, CE System 80, AP600/AP1000 DCDs are all different from each other in content and level of detail. None of those methodologies is consistent with methodology in draft SRPs 14.3 - 14.2-11. Plus, the NRC staff is requesting (through the RAI process) more ITAAC in the ESBWR Tier 1 than is required in draft SRPs 14.3 - 14.2-11. Therefore, with respect to the proper content and scope of the ITAAC, there is no consistency throughout the entire industry.

A definitive set of "yes/no" criteria should be provided in Chapter 14 to consistently determine the content and scope of the Tier 1 design descriptions and ITAAC.

Comments on DG-1145, C.I.15

1. C.I.15 and numerous subsections are mis-titled on two accounts.

   First, the section title and various subsection titles use the slang term of "transient" (which is undefined in the 10 CFRs) to mean an "anticipated operational occurrence" (AOO), which is defined in 10 CFR 50, App. A. An undefined slang term should never be used to replace a defined term, and thus, all "transient" statements should be corrected. For example, ESBWR Tier 2 Chapter 15 correctly does not label any group of abnormal design basis events as "transients."

   Second, Chapter 15 includes ATWS, which is neither an AOO nor an accident. ATWS in every BWR licensing basis and the associated ANS standard is labeled as a "special event." Therefore, the title to Chapter 15 should be changed to "Safety Analyses," and the other (non-Chapter 15) safety analyses, such as the ECCS-LOCA performance analysis in Section 6.3, should be included by reference.

2. C.I.15.2 correctly defines the design basis events (DBEs) into AOOs and accidents. Because a PRA is already required, C.I.15.2 should provide the event probability threshold value for determining which DBEs are AOOs and which are accidents. The historic AOO annual probability threshold for the BWR is 1/100 per year. This value is conservative based on one event occurring within a plant's 60 design life.

3. Consistent with the regulations, C.I.15.2 correctly divides the DBEs into just two categories, AOOs and accidents. However, the use of just these two DBE categories is not currently accepted by the NRC Staff. In December 2004, GE submitted licensing topic report (LTR) NEDO-33175, Rev. 0, "Classification of ESBWR Abnormal Events and Determination of Their Safety Analysis Acceptance Criteria," for NRC acceptance. LTR Rev. 0 was consistent with the regulations and C.I.15.2 in dividing the DBEs into AOOs

and accidents. The Staff did not accept that categorization, and required that DBEs which are less frequent than AOOs but are not "traditionally" called accidents be classified as "infrequent incidents or events," as reflected in the ESBWR DCD Tier 2 Chapter 15. To be consistent with the regulations the DBEs should be categorized as AOO, accidents and design basis accidents. The NRC Staff position should be made consistent with DG-1145.

4. The C.I.15.6.2 statement "Only safety-related systems and components may use to mitigate transients or accident conditions" is (a) inconsistent with the definition of safety-related in 10 CFR 50.2, 10 CFR 50.49 and 10 CFR 50 App. B, (b) inconsistent with the use of the safety-related criteria in 10 CFR 21.3 and 10 CFR 100 App. A, Section III, (c) inconsistent with the licensing bases of all BWRs (including the ABWR and ESBWR), (d) based on PWR short comings, (e) numerous future (waiting-to-happen) misinterpretations about the design/safety requirements of the BWR that could lead to unjustified cost increases and costly operating restrictions, and (f) in effect, a de-facto change to the regulations without going through the appropriate regulation change process.

   With respect to DBE categories, the 10 CFR 50.2 definition only applies safety-related to "The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the applicable guideline exposures set forth in § 50.34(a)(1) or § 100.11 of this chapter, as applicable." Therefore, except for those functions addressed in safety-related criteria (1) and (2), systems and components that are only credited for mitigating AOOs, accidents with consequences that are **not** "comparable to the applicable guideline exposures," and special events (e.g., ATWS, SBO and Safe Shutdown Fire) are not required to be safety-related. Contrary to the 10 CFR 50.2 definition of safety-related, the subject C.I.15.6.2 statement is already being misused in the Staff review of the ESBWR.

   As well have having redundant-independent safety-related systems, all BWRs have nonsafety-related systems that can significantly mitigate/reduce the effects of AOOs, (e.g., turbine bypass, recirculation pump trip, feedwater runback and selected control rod run-in), and are credited (applying the single failure criterion, as applicable) for in various non-accident safety analyses. PWRs do not have similar nonsafety-related capabilities, and thus, are forced to rely on their safety-related systems. Therefore, subject C.I.15.6.2 statement does not adversely affect the PWRs. However, that fact should not be used to either force BWRs systems to be changed to far more costly safety-related systems or change (i.e., delete) the systems credited for in the AOO safety analyses, which could result in significant fuel cycle penalties.

   AOOs, by definition, are part of normal operations, have event analysis acceptance criteria mostly based on GDC-10 and 15, and have no radiological consequence "comparable to the applicable guideline exposures." Therefore, any nonsafety-related system/component, designed to be available following an AOO initiating event, should be allowed to be credited in the events safety analysis.

   Similar to AOOs, safety analyses of the less significant accidents, i.e., those that do not have a radiological acceptance criteria based on § 50.34(a)(1) or § 100.11, should be allowed to take credit for available nonsafety-related systems.

The C.I.15.6.2 paragraph should be changed to read:

"Only safety-related systems or components can be used to mitigate the consequences of accidents which could result in potential offsite exposures comparable to the applicable guideline exposures set forth in 10 CFR 50.34(a)(1). However, nonsafety-related systems and components may be assumed operable in the safety analyses for AOOs, accidents with consequences that are **not** comparable to the applicable guideline exposures set forth in 10 CFR 50.34(a)(1), and special events (e.g., ATWS, SBO and Safe Shutdown Fire), if an additional non-consequential random and independent failures must occur in order to disable the system(s) or component(s)."