September 7, 2011

Mr. Russell J. Bell
Director, New Plant Licensing
Nuclear Generation Division
Nuclear Energy Institute
1776 I Street, NW, Suite 400
Washington, D.C. 20006-3708

SUBJECT: COMMENTS ON NUCLEAR ENERGY INSTITUTE 96-07, APPENDIX C: GUIDELINE FOR IMPLEMENTATION OF CHANGE CONTROL PROCESSES FOR NEW NUCLEAR POWER PLANTS LICENSED UNDER TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*, PART 52, SECTION 4.1.2.2.2, EVALUATION OF TIER 2 DEPARTURES THAT AFFECT EX-VESSEL SEVERE ACCIDENT DESIGN FEATURES

Dear Mr. Bell:

My staff is continuing its review of Nuclear Energy Institute (NEI) 96-07, Appendix C*, Guideline for Implementation of Change Control Processes for New Nuclear Power Plants Licensed Under 10 CFR 52*, which you submitted to the U.S. Nuclear Regulatory Commission (NRC) on October 5, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102980298) and amended *Section 4.1.2.2.2, Evaluation of Tier 2 departures that affect ex-vessel severe accident design features* on August 2, 2011 (ADAMS Accession No. ML112490540). This document provides guidance for implementing the licensing basis change process requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Part 52. Overall, we have found that *Section 4.1.2.2.2* of *Appendix C* to NEI 96-07 is comprehensive and provides an appropriate level of detail for future users. However, we have identified a number of recommendations for changes and some areas that need further clarification to meet the objectives of the change processes of 10 CFR Part 52, and have listed them in the enclosure.

We will discuss the staff comments on the guidance document at a future meeting to be scheduled during September 2011. We look forward to resolving these comments at the meeting and working to finalize this important guidance document. We appreciate your extensive effort in developing this document and anticipate you are issuing it in final form later this year. Subsequently, the staff will develop and issue its interim staff guidance endorsing Appendix C to NEI 96-07 during 2011.

If you have any questions regarding the staff comments, please contact Mr. Earl R. Libby at (301) 415-0522.

Sincerely,

/RA/

William F. Burton, Chief
Rulemaking and Guidance Development Branch
Division of New Reactor Licensing
Office of New Reactors

Project No.: 689

Enclosure:
NRC Comments on
NEI 96-07, Appendix C

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NRC Comments on
NEI 96-07, Appendix C

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U.S. Nuclear Regulatory Commission
Comments on NEI 96-07, Appendix C

Section 4.1.2.2.2, Evaluation of Tier 2 Departures that Affect Ex-Vessel Severe Accident Design Features, dated August 2, 2011

Page 1, first bulleted list

Recommend the addition of containment bypass to the bulleted listing as containment bypass is contained in the Regulation at 52.47(a)(23)

- core-concrete interaction,
- steam explosions,
- high pressure core melt ejection,
- hydrogen combustion, and
- containment bypass.

Page 1, Footnote

Recommend the addition of a footnote attached to the above containment bypass bullet.

Design features that prevent or mitigate containment bypass events are important from an overall severe accident safety perspective. However, these features are not in and of themselves EVSA features and as such may not fall under Section VIII.B.5.c criteria. Proposed changes to containment bypass features need to be evaluated to other criteria in Section 4.1.2.

Page 1, second bulleted list

Recommend additional constraints to the listing to clarify the facility locations.

- Reactor cavity flooding to promote in-vessel cooling and retention of core debris
- Reactor vessel depressurization to promote in-vessel cooling and retention of core debris
- Reactor vessel depressurization to prevent high pressure melt ejection
- Reactor cavity flooding to provide ex-vessel cooling of core debris
- Reactor cavity design to enhance core debris spreading and coolability
- Containment overpressure protection
- Containment combustible gas control
- Containment sprays and heat removal

Page 2, Section Screening, fourth paragraph, first sentence

Recommend change for continuity

"Some design features may have multiple ~~purposes~~ functions (i.e., they may be used to perform EVSA functions as well as design functions as defined in Section 3.3). If a design feature has both EVSA functions and design functions, the Section VIII.B.5.c criteria are used to evaluate departures related to the EVSA functions, and the Section VIII.B.5.b criteria are used to evaluate departures related to design functions."

Enclosure

Page 3, Section Evaluation, first paragraph

Recommend changes to correct to rule language and clarify

"For the first criterion, ~~prior NRC approval~~ a license amendment is required for proposed departures that could result in a new, credible EVSA. To evaluate whether a proposed departure results in a new, credible EVSA, licensees should use qualitative or quantitative criteria consistent with those used in the referenced DCD. It should be noted that the DCDs for the various new reactor designs may have used different terms for what constitutes *not credible*, including *practically eliminated, not physically feasible,* and *not relevant.* The full context of the relevant DCD discussion should be considered in the determination of what EVSAs had been previously reviewed and deemed not credible."

Page 3, Section Evaluation, second paragraph

Recommend changes to clarify

"For the second criterion, a ~~an applicant or~~ licensee may show that the departure will not result in a substantial increase in consequence to the public by demonstrating that the affected EVSA functions will still be successfully accomplished. A license amendment ~~Prior NRC approval~~ is ~~not~~ required for departures that ~~do not~~ remove, defeat or significantly degrade the performance of an EVSA design feature such that one or more functions of EVSA design features as described in the FSAR would not be accomplished. A change that would adversely impact an EVSA feature such that the containment performance goals in SECY-93-087 and SECY-90-016 would no longer be met could constitute a substantial increase in consequences to the public."

Page 3, Section Evaluation, third paragraph

Recommend changes to clarify

"For plants licensed or certified on the basis that there are no credible EVSAs (e.g., the design ensures in-vessel retention), criteria VIII.B.5.c.2 is not applicable. In this case, applicants and licensees may address the second EVSA criterion by stating that no credible EVSAs exist for the design, therefore no evaluation of consequences resulting from previously reviewed EVSAs is required. For changes to design features for combustible gas control, the applicants and licensees would still need to evaluate the proposed change against the requirements of 10 CFR 50.44(c) even if there were no credible EVSAs."

Page 3, Example 2

The minimum IRWST volume is specified in Table 2.2.3-4 ITAAC, as well as technical specifications. It is doubtful that a 10% change could occur without a license amendment, Proposed reducing this to 2%, and adding the note, in order to keep this example.

"The licensee of an AP1000 plant proposes to reduce the capacity of the In-containment Refueling Water Storage Tank (IRWST) by 2 ~~10~~%. Per Appendix 19B of Tier 2 of the AP1000 DCD, the IRWST has an EVSA function of flooding the reactor cavity to submerge the outer surface of the reactor vessel to the reactor coolant loop nozzles. Therefore, this change cannot

be screened out and must be evaluated under Section VIII.B.5.c of the design certification rule. The licensee performs a review of the existing analysis and determines that this small change in IRWST capacity would have a negligible effect on cooling the outer surface of the reactor vessel because the remaining capacity would be sufficient to submerge the outer surface of the reactor vessel to the reactor coolant loop nozzles. Therefore, the licensee concludes that the change does not require ~~NRC approval~~ a license amendment under VIII.B.5.c. (Note that a Tier 1 or technical specification change would still require a license amendment.)"

Page 3, Example 3

Recommend replacing the phrase "NRC approval" with "a license amendment" in the last sentence

During construction, the licensee identifies a nonconformance in that the thickness of a portion of the reactor cavity floor concrete is 0.1 foot less than the minimum thickness specified in Tier 2 of the referenced DCD. The reactor cavity floor is an EVSA design feature; therefore, Section VIII.B.5.c of the design certification rule must be considered to determine whether NRC approval is needed to accept this nonconformance. Based on a comparison with the existing analysis, the licensee determines that the reduction in thickness would have a negligible impact on the functional performance of the reactor cavity floor in the presence of core debris. Therefore, the licensee concludes that this nonconformance can be accepted as-is without ~~NRC approval~~ a license amendment.

Page 4, Example 4

Recommend removing reference to COPS from the ABWR design by using the phrase containment venting system

The licensee considers reducing the capacity of the containment ~~overpressure protection~~ venting system ~~(COPS)~~ by 50%. The containment venting system ~~(COPS)~~ is an EVSA design feature described at a high level in Tier 1 and in detail with specified pressure and flow rate in Tier 2 of the DCD; therefore, this change cannot be screened out and must be evaluated under Section VIII.B.5.c of the design certification rule. The licensee performs a calculation and determines that a 50% reduction would significantly degrade the containment venting system ~~(COPS)~~ function such that the containment may not be able to survive the pressures associated with the containment performance goals identified in SECY-93-087 and SECY-90-016, as approved by the associated Staff Requirements Memoranda, and described in NUREG-0800. As a result, the licensee concludes that there would be a substantial increase in the consequences of an EVSA previously evaluated, and this change would require a license amendment ~~NRC approval~~.