Interim Staff Guidance
Probabilistic Risk Assessment Information to Support
Design Certification and Combined License Applications

Purpose

This interim staff guidance (ISG) supplements the guidance provided to the staff in Section 19.0, "Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," concerning the review of probabilistic risk assessment (PRA) information and severe accident assessments submitted to support design certification (DC) and combined license (COL) applications.

Background

In June 2007, the Nuclear Regulatory Commission (NRC) revised Standard Review Plan (SRP) Section 19.0 to provide guidance to the staff during its review of PRA-related information contained in DC and COL applications. Also in June 2007, the NRC issued Regulatory Guide (RG) 1.206, "Combined License Applications for Nuclear Power Plants," to provide prospective COL applicants with guidance concerning the format and content of the application. Specifically, Section C.I.19 provides guidance on PRA information to support a COL application that is not based on a DC, and Section C.III.1 provides guidance when the COL application is based on a DC. The revisions to SRP Section 19.0 and RG 1.206 were based on revisions to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52 that were finalized in August 2007.

The staff held public meetings on July 19, July 24, and August 8, 2007, to explain its expectations with respect to the PRA information used to support the review of DC and COL applications. Discussions among prospective DC applicants, prospective COL applicants, and the staff indicated a need to supplement the guidance provided in SRP Section 19.0 and RG 1.206 in order to clarify the staff's expectations consistent with the requirements of 10 CFR Part 52.

On February 12, 2008, the staff issued the proposed ISG "Probabilistic Risk Assessment Information to Support Design Certification and Combined License Applications," (COL/DC-ISG-003) (Agencywide Documents Access and Management System (ADAMS) ML080370218) to solicit public and industry comment. The staff received comments on the proposed guidance on March 21, 2008 (ML080810201, ML080810204 and ML080840432). These comments were further discussed in a public meeting held on May 8, 2008 and are dispositioned in this final issuance of the staff guidance.

Rationale

Regulations pertaining to DC applicants:

1. 10 CFR 51.55(a) states that each DC application must include a separate document entitled "Applicant's Environmental Report - Standard Design Certification," which must address the costs and benefits of the severe accident mitigation design alternatives (SAMDAs), and the bases for not incorporating SAMDAs in the design to be certified.

2. 10 CFR 52.47(a)(8) states that a DC application must contain a final safety analysis report (FSAR) that provides the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island (TMI) requirements set forth in 10 CFR 50.34(f), except paragraphs (f)(1)(xii), (f)(2)(ix), and (f)(3)(v).

3. 10 CFR 52.47(a)(23) states that a DC application for a light-water reactor (LWR) design must contain an FSAR that includes a description and analysis of design features for the prevention and mitigation of severe accidents, *e.g.*, challenges to containment integrity caused by core-concrete interaction, steam explosion, high-pressure core melt ejection, hydrogen combustion, and containment bypass. With respect to this regulation, the following items are noted:

   a. The Statement of Consideration [72 *Federal Register* (FR) 49380] for the revised Part 52 states that postulated severe accidents are not design-basis accidents (DBA) and the severe accident design features do not have to meet the requirements for DBA (see SECY-93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor Designs," dated April 2, 1993). However, the severe accident design features are part of a plant's design bases information.

   b. The Statement of Consideration [72 FR 49394] for the revised Part 52 states that the Commission codified separate criteria in paragraph B.5.c of Section VIII of each design certification rule (DCR) (DCR, which are currently Appendices A, B, C, and D to 10 CFR Part 52) for determining if a departure from design information that resolves these severe accident issues would require a license amendment. The final rule amends paragraph B.5.c to clarify that the special process applies to ex-vessel severe accident design features that are described in the plant-specific design control document (DCD).

      For purposes of applying the special criteria in paragraph B.5.c of Section VIII, severe accident resolutions are limited to those design features where the intended function of the design feature is relied upon to resolve postulated accidents when the reactor core has melted and exited the reactor vessel (ex-vessel severe accidents) and the containment is challenged. The location of the ex-vessel severe accident design information in the DCD is not important to the application of this special departure process in paragraph B.5.c. Some design features may have intended functions to meet both "design-basis" requirements and to resolve ex-vessel severe accidents. If these design features are reviewed under paragraph VIII.B.5, then the appropriate criteria from either paragraph B.5.b or B.5.c are selected depending upon from which function the departure is being taken.

4. 10 CFR 52.47(a)(27) states that a DC application must contain an FSAR that includes a description of the design-specific PRA and its results. With respect to this regulation, the following items are noted:

   a. The Statement of Consideration [72 FR 49365] for the revised Part 52 states that the definition of Tier 2 in Section II.E.1 of the DCRs has been modified to exclude

the design-specific PRA and the evaluation of SAMDAs. The PRA and SAMDA evaluations do not need to be included in Tier 2 because they are not part of the design-basis information.

b. The Statement of Consideration [72 FR 49380] for the revised Part 52 states the understanding that the complete PRA (*e.g.*, codes) will be available for NRC inspection at the applicant's offices, if needed. The NRC expects that, generally, the information that it needs to perform its review of the DC application from a PRA perspective is that information that will be contained in applicants' FSAR Chapter 19.

c. Prior to the revision to 10 CFR Part 52 in August 2007, regulations required DC applicants to separately submit their PRAs. As a result, Chapter 19 of the design-specific DCDs submitted before the issuance of this rule revision did not include many PRA quantitative results.

5. 10 CFR 52.47(b)(2) states that a DC application must contain an environmental report (ER) as required by 10 CFR 51.55. The Statement of Consideration [72 FR 49443] for the revised Part 52 states that this assessment is distinct from, and in addition to, the requirement in paragraph 10 CFR 52.47(a)(23) to provide a description and analysis of severe accident design features.

Regulations pertaining to COL applicants:

1. 10 CFR 51.50(c) states that each COL application must include a separate document entitled "Applicant's Environmental Report - Combined License Stage." If the COL references a DC, then the COL ER may incorporate by reference the environmental assessment previously prepared by the NRC for the referenced DC. If the DC environmental assessment is referenced, then the COL ER must contain information to demonstrate that the site characteristics for the COL site fall within the site parameters in the DC environmental assessment.

2. 10 CFR 52.79(a)(17) states that a COL application for a LWR design must contain an FSAR that provides the information with respect to compliance with technically relevant positions of the TMI requirements in 10 CFR 50.34(f) of this chapter, with the exception of 10 CFR 50.34(f)(1)(xii), 10 CFR 50.34(f)(2)(ix), and 10 CFR 50.34(f)(3)(v).

3. 10 CFR 52.79(a)(18) states that a COL application must contain the information required by 10 CFR 50.69(b)(2), if the applicant seeks to use risk-informed treatment of structures, systems, and components (SSCs) in accordance with 10 CFR 50.69.

4. 10 CFR 52.79(a)(38) states that a COL application for a LWR design must contain an FSAR that includes a description and analysis of design features for the prevention and mitigation of severe accidents, for example, challenges to containment integrity caused by core-concrete interaction, steam explosion, high-pressure core melt ejection, hydrogen combustion, and containment bypass.

5. 10 CFR 52.79(a)(46) states that a COL application must contain an FSAR that includes a description of the plant-specific PRA and its results. With respect to this regulation, the following items are noted:

   a. The Statement of Consideration [72 FR 49387] for the revised Part 52 states the understanding that the complete PRA (*e.g.*, codes) would be available for NRC inspection at the applicant's offices, if needed. The NRC expects that, generally, the information that it needs to perform its review of the COL application from a PRA perspective is that information that will be contained in applicants' FSAR Chapter 19.

   b. RG 1.206 provides guidance on reporting PRA-related information. As discussed in the Statement of Consideration [72 FR 49387], the guidance focuses on qualitative description of insights and uses, but also acknowledges that some quantitative PRA results should be submitted.

6. 10 CFR 52.79(d)(1) states that if a COL application references a DC, then the plant-specific PRA information must use the PRA information for the DC and must be updated to account for site-specific design information and any design changes or departures. The Statement of Consideration [72 FR 49388] for the revised Part 52 states in the case where a COL application is referencing a DC, the NRC only expects the design changes and differences in the modeling (or its uses) pertinent to the PRA information to be addressed to meet the submittal requirement of 10 CFR 52.79(d)(1).

7. Section IV.A.2.a of each DCR states that a COL application which references a DC must include a plant-specific DCD containing the same type of information and using the same organization and numbering as the generic DCD for the certified design, as modified and supplemented by the applicant's exemptions and departures.

Regulations pertaining to COL holders:

1. 10 CFR 50.71(h)(1) states that no later than the scheduled date for initial loading of fuel, each holder of a COL shall develop a level 1 and a level 2 PRA. The PRA must cover those initiating events and modes for which NRC-endorsed consensus standards on PRA exist one year prior to the scheduled date for initial loading of fuel. The Statement of Consideration [72 FR 49362 and 72 FR 49405] for the revised Part 52 states that it is not required to submit this PRA to the NRC, but instead should be maintained by the licensee for NRC inspection. The need for any such submittal or review would be determined by any risk-informed application for which the licensee might wish to use this PRA, such as in support of licensing actions. It is further stated [72 FR 49405] that the 1-year time period was chosen to allow time for the licensee to develop and upgrade its PRA and conduct peer review prior to the date when the PRA must be completed (i.e., by the scheduled date for initial fuel load). The scheduled fuel load date was selected because the COL holder chooses this date, and thus is in a position to determine when the "one-year prior" requirement comes into effect.

2. 10 CFR 50.71(h)(2) states that each COL holder must maintain and upgrade the PRA required by 10 CFR 50.71(h)(1). The upgraded PRA must cover initiating events and

modes of operation contained in NRC-endorsed consensus standards on PRA in effect 1 year prior to each required upgrade. The PRA must be upgraded every 4 years until the permanent cessation of operations under 10 CFR 52.110(a). With respect to this regulation, the following items are noted:

a. The Statement of Consideration [72 FR 49405] for the revised Part 52 states that the Commission intends PRA maintenance and PRA upgrade to be consistent with how they are defined in the American Society of Mechanical Engineers (ASME) "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications" (ASME-RA-Sb-2005).

b. No specific frequency is defined in the rule for PRA maintenance; the Commission expects licensees to follow the ASME (or other consensus body) guidance on this aspect.

c. The Statement of Consideration [72 FR 49405] for the revised Part 52 states that if no new standards are issued during a four-year upgrade cycle, licensees would not be required to upgrade their PRAs; however, the requirement to maintain the PRA would still be in effect. It should also be noted that there may be situations where a PRA upgrade is needed more frequently than the four-year cycle, as for instance to support a new risk-informed application.

3. 10 CFR 50.71(h)(3) states that each COL holder must, no later than the date on which the licensee submits an application for a renewed license, upgrade the PRA required by 10 CFR 50.71(h)(1) to cover all modes and all initiating events. With respect to this regulation, the following items are noted:

a. The Statement of Consideration [72 FR 49405-49406] for the revised Part 52 states that this requirement is not premised on the existence of NRC-approved consensus standards, and an all-mode, all-initiator PRA must be developed even if standards do not yet exist.

b. The Statement of Consideration [72 FR 49406] for the revised Part 52 states that the requirement to develop and maintain such a PRA by the time of license renewal application is intended only to establish a timing requirement for completing the upgrade of the PRA, and does not have any implications on the current requirements for license renewal. The upgraded PRA is not an element of any (i.e., past, present, or future) review or approval of a license renewal application.

Commission Direction and Staff Guidance

1. The Staff Requirements Memorandum (SRM) dated July 21, 1993 on SECY-93-087 provides direction about the treatment of external events in PRAs to support DC and COL applications. Specifically:

a. The Commission approved the use of 1.67 times the design-basis safe-shutdown earthquake (SSE) for a margin-type assessment of seismic events.

b. The Commission approved the use of PRA insights to support a margins-type assessment of seismic events. A PRA-based seismic margins analysis will consider sequence-level high confidence, low probability of failures and fragilities for all sequences leading to core damage or containment failures up to approximately one and two thirds the ground motion acceleration of the Design Basis SSE.

c. The Commission approved the use of simplified probabilistic methods, such as but not limited to the Electric Power Research Institute's Fire-Induced Vulnerability Evaluation (EPRI's FIVE) methodology, to evaluate fire risk.

d. The Commission approved the staff's position that advanced LWR vendors should perform bounding analyses of site-specific external events likely to be a challenge to the plant (such as river flooding, storm surge, tsunami, volcanism, high winds, and hurricanes). When a site is chosen, its characteristics should be compared to those assumed in the bounding analyses to ensure that the site is enveloped. If the site is enveloped, the COL applicant need not perform further PRA evaluations for these external events. The COL applicant should perform site-specific PRA evaluations to address any site-specific hazards for which a bounding analysis was not performed or which are not enveloped by the bounding analyses to ensure that no vulnerabilities due to siting exist.

2. Regulatory Issue Summary 07-06, "Regulatory Guide 1.200 Implementation," dated March 22, 2007, states that PRAs required under 10 CFR Part 52 should use NRC-endorsed consensus standards to the extent practicable.

Applicability

This ISG shall be implemented on the day following its issuance. It shall remain in effect until it has been superseded, withdrawn, or incorporated into a revision of the SRP and RG 1.206.

Interim Staff Guidance

1. In accordance with the Statement of Consideration for the revised Part 52 [72 FR 49365], the design-specific PRA is excluded from the Tier 1 or Tier 2 information that comprises the DC information. As a result:

   a. The description of the PRA and its results included in Chapter 19 of the generic DCD/FSAR is subject to the restrictions of 10 CFR 52.63(a)(1) concerning the finality of standard DCs.

   b. Section IV.A.2.a in each existing DCR, which requires COL applicants to provide a plant-specific DCD containing the same type of information and using the same organization and numbering as the generic DCD, applies to the description of the PRA and its results included in Chapter 19 of the FSAR, but does not apply to the PRA (including, but not limited to, the event tree analyses, the fault tree analyses, the data analyses, the human reliability analyses, the PRA computer model) that supports a COL application. Furthermore, Section IV.A.2.a in each

existing DCR applies to the overall content and organization of information among the FSAR chapters, but does not apply to the content or organization of information within each FSAR chapter. Specifically, Chapter 19 of each plant-specific FSAR must describe the PRA and severe accident evaluations; however, the format of information within Chapter 19 is left to the discretion of each COL applicant. The staff should ensure that applicants' FSAR Chapter 19 contains the information needed to review the COL application, regardless of how the information is formatted or organized within FSAR Chapter 19. In the future revision of RG 1.206, Section C.III.1 will be revised in accordance with Section IV.A.2.a in each existing DCR.

c. The design-specific PRA is not subject to the change processes contained in Section VIII of the existing DCRs.

2. In accordance with the Statement of Consideration for the revised Part 52 [72 FR 49387] and Item 1 above, COL applicants should include PRA quantitative results in Chapter 19 of their plant-specific FSARs. The description of "quantitative results" can be found in SRP Section 19.0 and Appendix A to RG 1.206, Section C.I.19. Additional clarifications are provided as follows:

   a. The internal events PRA quantitative results should include internal floods and their contributions.

   b. FSAR Chapter 19 should also include PRA qualitative results, including the identification of PRA assumptions, the identification of PRA-based insights, and discussion of the results and insights from importance, sensitivity, and uncertainty analyses.

   c. It is acceptable for applicants to report significant risk contributors by separate hazard groups (i.e., provide separate lists of the contributors for internal events, the contributors for internal floods, the contributors for seismic events, the contributors for internal fires, etc.). Applicants may also elect to develop an integrated list of significant risk contributors that summarize the results across all hazard groups.

   d. In the context of the PRA results and insights, the term "significant" is intended to be consistent with its definition provided in RG 1.200. The definitions of "significant accident sequence" and "significant contributor" are suitable for both large early release frequency and large release frequency (LRF). Using any other definition of "significant" inconsistent with the definitions provided by RG 1.200 shall be subject to additional staff review and approval.

   e. RG 1.206, Section C.III.1 addresses the COL applications that reference a DC. If there are any design changes or departures from the certified design, the staff expects COL applicants to submit the PRA numerical changes when the cumulative risk impact of the changes resulting from the COL departure is more than a 10% change (either positive or negative) in the total core-damage frequency or total LRF from the DC PRA. Additionally, all changes in key

assumptions per RG 1.200 and all changes in risk insights as defined in RG 1.206 including differences between the updated risk insights and the certified design risk insights should also be submitted to the NRC in accordance with the guidance in Section C.III of RG 1.206. All changes or departures from the design that result in a revision of PRA-based qualitative results should also be reported to the NRC. The COL applicants should describe their approach for maintaining and periodically upgrading the PRA in accordance with RG 1.206, Section C.I.19.7 and RG 1.200.

3. In accordance with the Statement of Consideration for the revised Part 52 [72 FR 49365], the design-specific PRA is not part of the design basis information. Therefore, the PRA is not subject to the quality assurance requirements of 10 CFR Part 50, Appendix B.

4. Reviewers must determine that the quality of the PRA is sufficient to justify the specific results and risk insights that are used to support the DC or COL application. As discussed in RGs 1.174 and 1.200, the quality of a PRA is measured in terms of its appropriateness with respect to scope, level of detail, and technical adequacy. In making this determination, reviewers should consider the information provided by applicants in FSAR Chapter 19 and responses to the staff's requests for additional information (RAIs) and/or obtained by the staff during onsite audits. With respect to PRA quality, the following items are noted:

   a. There are no regulatory requirements in 10 CFR Part 52 that specifically pertain to PRA quality with respect to DC or COL applications.

   b. RG 1.206 and SRP Section 19.0, as supplemented by this ISG, indicate the expected scope and level of detail of a PRA used to support a DC or COL application. Exceptions to this expected scope and level of detail may be acceptable if adequately justified by the applicant.

   c. PRAs that meet the applicable supporting requirements for Capability Category I and meet the high level requirements as defined in the ASME PRA Standard (ASME-RA-Sb-2005) should generally be acceptable for DC and COL applications. The PRA documentation is excluded from Tier 2 of the DC and it is not part of the design-basis information. However, the PRA is used to identify Tier 1 and Tier 2 information.

   d. RG 1.200 contains the staff's guidance concerning PRA technical adequacy and peer review. Peer review of the DC PRA is not required prior to application, however, if a peer review was conducted prior to the application, the staff should examine the peer review report. If a certain aspect of the PRA deviates from accepted good practices, the applicant/holder should justify that this deficiency does not impact the PRA results or risk insights. Otherwise, applicants/holders need to correct the deficiency and resubmit the PRA results and risk insights. If a peer review has not been performed, the applicants/holders should justify why their PRAs are adequate in terms of scope, level of detail, and technical acceptability. If the applicant’s/holder’s justification fails to provide the staff with

an appropriate level of confidence in the models, results, and insights, the staff should conduct an audit of the applicant's/holder's PRA against the technical elements described in RG 1.200 to determine the PRA technical adequacy.

5. Consistent with the SRM dated July 21, 1993, concerning SECY-93-087, plant-specific seismic risk evaluations conducted in support of COL applications may use the seismic margins methodology if (a) the COL application is based on a standard DC, and (b) the PRA that supports the DC used the seismic margin methodology. Once the NRC has endorsed a consensus seismic risk standard, the staff expects that DC applications submitted starting one year later will follow RG 1.200. COL holders whose COL applications were based on the seismic margins methodology must upgrade their PRAs in accordance with the requirements of 10 CFR 50.71(h).

6. Consistent with the SRM dated July 21, 1993 concerning SECY-93-087, plant-specific internal fire risk evaluations conducted in support of COL applications may use simplified methodologies (*e.g.*, the EPRI's FIVE methodology) if (a) the COL application is based on a standard DC, and (b) the PRA that supports the DC used the simplified internal fire risk methodology. Once the NRC has endorsed a consensus internal fire risk standard, the staff expects that DC applications submitted starting one year later will follow RG 1.200. COL holders whose COL applications were based on the simplified internal fire risk methodology must upgrade their PRAs in accordance with the requirements of 10 CFR 50.71(h).

7. The following text in RG 1.206, Page C.I.19-5 does not accurately reflect the staff's position and will be removed from the future revision.

   "The scope of a COL applicant's PRA may be somewhat broader than the initial scope of a COL holder's PRA due to the possible lack of NRC-endorsed industry consensus standards and peer review processes. Specifically,"

8. PRA maintenance should commence at the time of application for both DC and COL applicants. This means that the PRA should be updated to reflect plant modifications if there are changes to the design. COL applicants should describe their PRA maintenance process in FSAR Chapter 19. Once the certification is issued, DC applicant's PRA would not need to be updated except as appropriate in connection with a DC amendment request.

9. PRA upgrade should commence no later than the scheduled date for initial fuel load. This means that COL holders, in accordance with 10 CFR 50.71(h), must upgrade the PRA used to support the COL to cover those initiating events and modes of operation contained in NRC-endorsed consensus standards that exist one year prior to each required upgrade.

   ASME PRA Standard describes "PRA upgrade" as the incorporation into a PRA model of a new methodology or significant changes in scope or capability. This could include items such as new human error analysis methodology, new data update methods, new approaches to quantification or truncation, or new treatment of common cause failure.

10. In accordance with the Statement of Consideration for the revised Part 52 [72 FR 49387], the NRC expects that, generally, the information that it needs to perform its review of an application from a PRA perspective is that information contained in applicants' FSAR Chapter 19. The staff should use the RAI process and/or site audits to obtain clarifying information as needed. However, neither the RAI process nor onsite audits should be used to supplement an incomplete application.

11. In accordance with 10 CFR 51.55 (applicable to DC applications) and 10 CFR 51.50(c) (applicable to COL applications), the SAMDA evaluation must be included in the applicant's ER, not the FSAR.

12. References to "Reactor Oversight Process" (ROP) in SRP Section 19.0, Page 19.0-25, Appendix C.I.19-A to RG 1.206, Page C.I.19.A-9 (two places), and the "ROP" in Appendix A to RG 1.206, Page C.I.19A-2 refer to regulatory oversight processes. Examples of regulatory oversight processes are the mitigating systems performance index and the significance determination process.

13. On a case-by-case basis, the NRC allows the use of design acceptance criteria (DAC) approach in specific areas (i.e., radiation protection, piping, instrumentation and controls, and human factors engineering) in lieu of detailed design information. However, to allow staff to evaluate the resolution of severe accident issues in the design and to ascertain how the risk insights from the design PRA are derived, DC applicants should address those portions of the design covered by DAC in the design PRAs to the extent practicable. If it is not practical to model certain areas that employ DAC in the design PRA, the applicant should identify those areas and qualitatively assess their impacts on the PRA results and insights. Any assumptions made regarding the reliability or performance of SSCs under DAC during this process shall be verified when the design is finalized. Furthermore, the staff should review the DC applicant's PRA in accordance with the available interim staff guidance on parts of the design where DAC are used.

Recommendation

The staff and DC/COL applicants should be aware of the availability of PRA-related consensus standards and the status of the staff's endorsement of them.

Final Resolution

The contents of COL/DC-ISG-03 will subsequently be incorporated into Section 19.0 of the SRP, appropriate sections of RG 1.206, and other guidance documents.

References

1. NRC, “Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors,” Section 19.0, SRP, NUREG-0800, Revision 2, ADAMS Accession No. ML071700652, June 2007.

2. NRC, “Probabilistic Risk Assessment and Severe Accident Evaluation,” Section C.I.19, COL Applications for Nuclear Power Plants (LWR Edition), RG 1.206, Revision 0, ADAMS Accession No. ML070630023, June 2007.

3. NRC, “Chapter 19: C.I.19 Probabilistic Risk Assessment and Severe Accident Evaluation,” Section C.III.1, pp. 191-192, COL Applications for Nuclear Power Plants (LWR Edition), RG 1.206, Revision 0, ADAMS Accession No. ML070630027, June 2007.

4. NRC, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” *Federal Register*: Volume 72, Number 166, pp 49352-49566, August 28, 2007.

5. NRC, “Summary of July 19, 2007 Category 2 Meeting to Discuss Probabilistic Risk Assessment Information to Support Design Certification and Combined License Applications (TAC No. MC4370),” ADAMS Accession No. ML072290119, August 20, 2007.

6. NRC, “Summary of the July 24 and 25, 2007, Meeting to Discuss Pre-Combined License Application Issues,” ADAMS Accession No. ML072110412, September 15, 2007.

7. NRC, “Summary of August 8-9, 2007 Discussion with Industry on Recent Guidance for Combined License Applications Public Meeting,” ADAMS Accession No. ML072700251, October 10, 2007.

8. NRC, “Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor Designs,” SECY-93-087, ADAMS Accession No. ML003708021, April 2, 1993.

9. NRC, “SECY-93-087 - Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor Designs,” SRM, ADAMS Accession No. ML003708056, July 21, 1993.

List of Acronyms

ADAMS	Agencywide Documents Access and Management System
ASME	American Society of Mechanical Engineers
COL	combined license
CFR	*Code of Federal Regulations*
DC	design certification
DCD	design control document
DCR	design certification rule
EPRI	Electric Power Research Institute
ER	environmental report
FR	*Federal Register*
FIVE	fire-induced vulnerability evaluation
FSAR	final safety analysis report
ISG	interim staff guidance
LRF	large release frequency
NRC	Nuclear Regulatory Commission
PRA	probabilistic risk assessment
RAI	request for additional information
RG	regulatory guide
ROP	Reactor Oversight Process
SAMDAs	severe accident mitigation design alternatives
SRM	staff requirements memorandum
SRP	Standard Review Plan
SSE	safe-shutdown earthquake
SSCs	structures, systems, and components