



COL/DC-ISG-003

PRA Information to Support Design Certification and Combined License Applications

**Division of Safety Systems and Risk Assessment
Office of New Reactors
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Slide 2

Outline



- Background
- Purpose of COL/DC-ISG-003
- Public Comments and Staff Position

Background



- In April 2007, the Commission approved draft revision to 10 CFR 52
- In June 2007, the NRC issued revision to SRP Section 19.0.
- In June 2007, the NRC issued RG 1.206, "*Combined License Applications for Nuclear Power Plants*"
- On July 19, 2007 the staff held a public meeting to explain the recent regulation changes and newly issued regulatory guidance
- Follow-up public meetings were conducted on July 24 (DCWG), August 8 (DCWG), and September 6, 2007 (ACRS)
- In August 2007, the NRC published a revision to 10 CFR 52

Purpose of COL/DC-ISG-003



Supplement the guidance provided to the staff in NUREG-0800, Section 19.0, "*Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors,*" concerning the review of PRA and severe accident information submitted to support DC and COL applications.

Public Comments on the Proposed Interim Staff Guidance (ISG)



- On February 20, 2008, the staff posted the proposed COL/DC-ISG-003 in Federal Register (Vol. 73, No. 34) to solicit public comment
- The staff received two sets of comments, from NEI and AREVA

Comment 1 (NEI / AREVA): Definition of Risk “Significant” for New Reactors



The criteria of a 5% change to the CDF meriting distinction as a “significant impact” is not appropriate given the small absolute CDF values of advanced reactors.

Staff Position

- Percent change is for reporting purposes (only applicable to COLs referencing DCs)
- In the context of the PRA results and insights, the term “significant” is intended to be consistent with its definition provided in NRC endorsed PRA standards

Comment 1 (NEI / AREVA): Definition of Risk “Significant” (continued)



- Proposed ISG Item 2.d (ISG Page 7) will be modified as follows:

“In the context of the PRA results and insights, the term “significant” is intended to be consistent with its definition provided in the NRC endorsed PRA Standards (e.g., ASME RA-S-2002, ASME RA-Sb-2005, ASME/ANS RA-S-2008). . . .”

- Proposed ISG Item 2.e (ISG Page 7) will be modified as follows:

“RG 1.206, Section C.III.1 addresses the COL applications that reference a design certification. For reporting purposes only, the staff expects to receive PRA numerical changes when the cumulative risk impact of individual changes resulting from the COL departure is more than a 10% change (either positive or negative) in the total CDF or total LRF from the design certification PRA. Additionally, all changes in key assumptions per ASME PRA standard and all changes in PRA 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.”

Comment 2 (NEI): Endorsement of Seismic and Fire PRA Standards



As-built plant info is not available at the time of a DC application.

Staff Position

- Commission approved the use of PRA-based seismic margins analysis and EPRI’s FIVE for DC applications (SECY-93-087) (ISG Page 5)
- DC applicants should follow RG 1.200, which will be updated to include guidance for new reactors
- Proposed ISG Item 5 (ISG Page 8) will be modified as follows:

“...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 ...”

- Proposed ISG Item 6 (ISG Page 9) will be modified as follows:

“...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 that RG 1.200. COL holders...”

Comment 3 (NEI) Regulations Pertaining to DC Applicants



The ESBWR DC application should be specifically named under rationale 4c.

Staff Position

Item 4c (ISG Page 3) only specifies the designs that have been certified, however, ESBWR is not yet.

Comment 4 (NEI): Regulations Pertaining to COL Holders



Item 2 under “Regulations Pertaining to COL Holders” should be clarified consistent with Item 4, as follows: “The PRA must be ~~upgraded~~ evaluated every four years and upgraded, as appropriate, until the permanent cessation....”

Staff Position

(ISG Page 4) COL holders shall follow the regulatory requirements.

Comment 5 (NEI): Use of Design Acceptance Criteria (DAC)



Not possible to create PRA models for systems that employ DAC (e.g. digital I&C, human factors). The ISG should state that design PRAs are not required to model parts of the design covered by DAC.

Staff Position

- DC applications should address the portions of the design covered by DAC in the design PRA to the extent practicable
- New item will be added to the ISG (ISG Page 10) as follows:

“On a case-by-case basis, the NRC allows the use of design acceptance criteria (DAC) approach in those areas where detailed design information is not sufficient. 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 structures, systems, or components 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.”