Interim Staff Guidance (ISG) Background

United States Nuclear Regulatory Commission

NRC/NEI Meeting to Discuss and Clarify NEI Comments on Interim Staff Guidance HLWRS-ISG-01
September 14, 2006

Enclosure 4

Purpose

- Describe the ISG process
- Provide current status of the HLWRS-ISG-01 *Review Methodology for Seismically Initiated Event Sequences*
- Describe briefly the draft HLWRS-ISG-01, to facilitate discussion and clarification on the Nuclear Energy Institute (NEI) comments
- Summarize the NEI comments on the draft HLWRS-ISG-01

ISG Process

- ISG reflects a focused revision to a Standard Review Plan (SRP), such as the Yucca Mountain Review Plan (YMRP), NUREG-1804, Revision 2
- Scope of an ISG is limited to specific technical issues
- ISG, like YMRP, is for staff guidance for review of a potential DOE License Application
- During the ISG development process, the technical and regulatory bases for the ISG are reviewed by appropriate NRC technical, management, and legal staff

ISG Process (contd.)

- The Commission is informed prior to ISG issuance for public comment and as a final document

- Because compliance with ISG/SRP/YMRP is not mandatory, an applicant has the option of proposing alternative methodologies to comply with the regulations

Current Status

- Draft HLWRS-ISG-01 was issued on May 22, 2006 for public comment
- The draft ISG was presented in a Technical Exchange public meeting with DOE on June 7, 2006
- Public comment period closed on July 6, 2006
- Five organizations responded providing 23 comments
- Staff is considering public comments to develop final HLWRS-ISG-01 by September 30, 2006

Draft HLWRS-ISG-01

- HLWRS-ISG-01 provides guidance to the staff on review methodology for seismically initiated event sequences
- The methodology proposed in the draft ISG has precedent in the Mixed-Oxide (MOX) Fuel Fabrication Facility at the Savannah River Site in South Carolina
- The proposed review methodology is consistent with the performance-based methodology in the consensus standard ASCE 43-05

Draft HLWRS-ISG-01 (contd.)

- The methodology proposed in the draft ISG has the scientific support of the experts in the industry, and is not beyond the state-of-the-art for performance evaluation of structures, systems, and components for seismic hazard

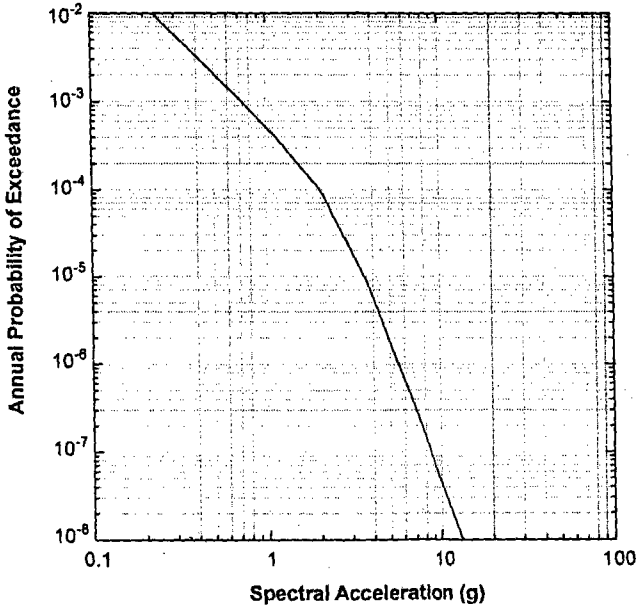
- The ISG guidance would enable staff to review a potential DOE License Application in the area of demonstration of compliance with performance objectives of 10 CFR 63.111(b)(2) for potential Category 2 seismic event sequences

Part 63 Regulations for Preclosure Safety Analysis (PCSA)

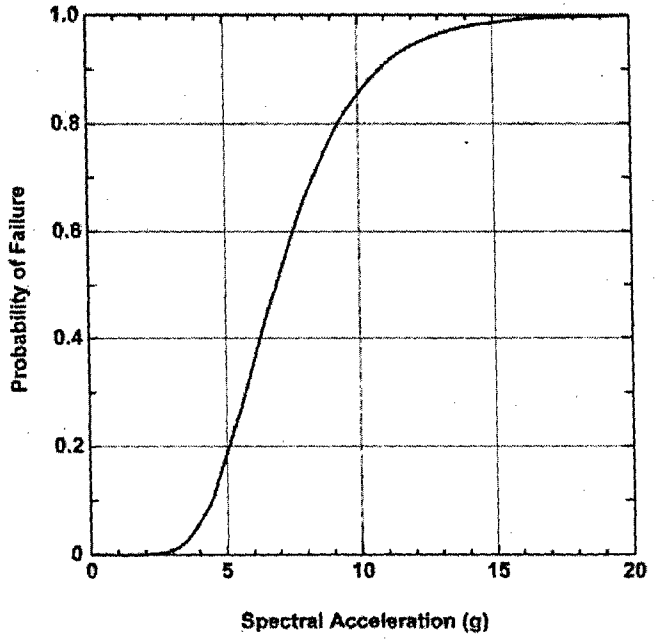
- 10 CFR 63.112 Requirements for preclosure safety analysis of the Geologic Repository Operations Area (GROA)
- 10 CFR 63.111(a), 111(b)(1): Category 1 Event Sequences are those that are expected to occur one or more times before permanent closure of the GROA
- 10 CFR 63.111(b)(2): Category 2 Event Sequences are those other event sequences that have at least one chance in 10,000 of occurring before permanent closure of the GROA

Seismic Hazard and Fragility Curves

Hypothetical Seismic Hazard curve at a specified frequency



Example Seismic Fragility Curve for a specified frequency

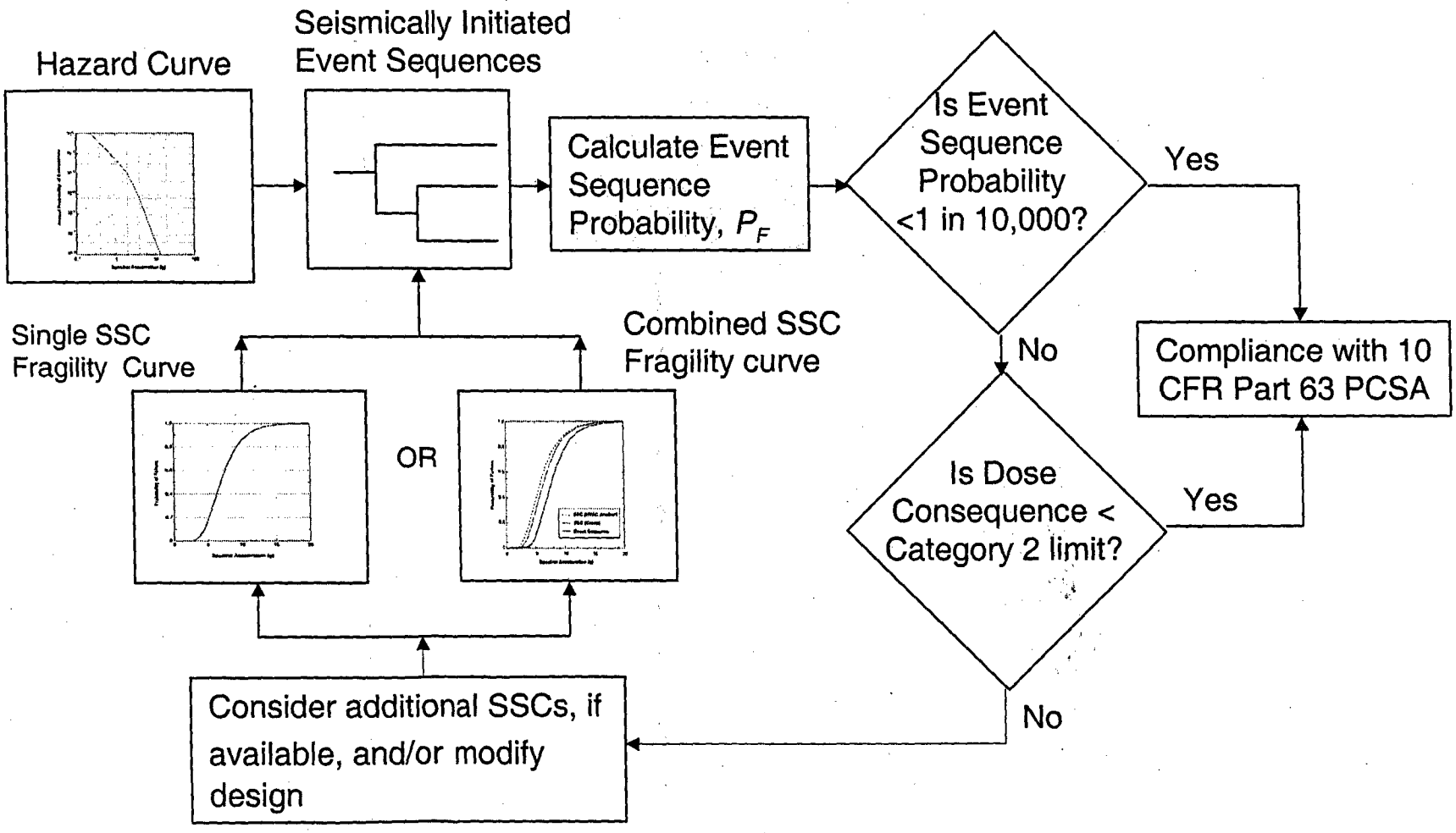


Example for Illustration Only

Seismically Initiated Event Sequence

- Seismic hazard curve
- Fragility curve of an SSC ITS
- Probability of an event sequence for failure of an SSC ITS can be computed by convolving the hazard curve with the fragility curve (see ASCE 43-05, equation C2-6)

HLWRS-ISG-01 Methodology for Compliance with Part 63 PCSA



Need for the ISG-01

- 10 CFR 63.111 requires evaluation of event sequences, which can involve multiple structures, systems, and Components (SSCs) important to safety (ITS)
- Seismic hazard includes a range of probabilities of exceedance, not a single initiating event
- In contrast, many other safety analyses consider only a single earthquake initiating event at a pre-determined design level
- ISG helps staff focus review on the integrated approach needed to evaluate complete event sequences for compliance with Part 63

Public Comments

- 23 comments received from 5 different organizations, three of the comments being similar
- One comment was similar to one of the NEI comments
- NEI comments:
  - ISG is not the most effective means for NRC to clarify its regulatory intent and could lead to unforeseen consequences due to inadequate review (including not being reviewed by the Commission itself)

NEI Comments (contd.)

- "Interim" guidance is unnecessary in a situation where there is a single potential licensee that is not currently conducting any licensed activities

- The ISG lacks safety focus in that it sets forth a more stringent standard for the seismic design of repository surface facilities than the existing criteria for reactors, and that the staff ignores the existence of Section 63.102(f)

NEI Comments (contd.)

- A specific methodology described in the ISG is likely to bias the staff's review against other methodologies that DOE may propose that provide equal or better protection of public health and safety

- The specific methodology proposed in the ISG lacks both precedent and scientific support

Summary

- HLWRS-ISG-01 is a focused revision to the YMRP to provide guidance to the staff on review methodology for seismically initiated event sequences
- The ISG is needed to provide staff guidance on the review of potential seismic event sequences, which may include multiple SSCs ITS for a seismic hazard that occurs over a range of probabilities
- THE ISG methodology is consistent with the consensus standard ASCE 43-05, and has precedent in the MOX facility
- Staff is considering public comments on the draft ISG to develop the final ISG by September 39, 2006