



# External Events

Pre-Application Audit

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# **Design Certification**

## **10 CFR 52.47 Contents of applications; technical information.**

- (a) The application must contain a final safety analysis report (FSAR) that describes the facility, presents the design bases and the limits on its operation, and . . . must include the following information:**
  - (1) The site parameters postulated for the design, and an analysis and evaluation of the design in terms of those site parameters; . . .**
  - (27) A description of the design-specific probabilistic risk assessment (PRA) and its results.**

# **“Traditional” Analysis**

- **Certified design assumes external event loads as inputs to the design of SSCs:**
  - Seismic design response spectra
  - Wind (and other) loads
  - Flooding sources
  - Hypothetical hazards (missiles, toxic or explosive gas)
- **Described and evaluated in the FSAR**
  - Chapter 2, “Site Characteristics and Site Parameters”
  - Chapter 3, “Design of Structures, Components, Equipment, and Systems”

# Risk Assessment

- Contribution to **risk** from the same external events must be addressed in FSAR Chapter 19
- Most can be screened:
  - Plant designed to withstand challenge
  - Hazard frequency so low that  $\Delta$ risk is negligible
  - Hazard consequence so low that  $\Delta$ risk is negligible
- When  $\Delta$ risk is not negligible, the contribution must be described in Chapter 19

# **Standard for Level 1/LERF PRA**

**ASME/ANS RA-Sa–2009  
(as endorsed in RG 1.200)**

- **Part 5 – Seismic Events**
- **Part 6 – Screening of Other External Hazards**
- **Part 7 – High Winds**
- **Part 8 – External Floods**
- **Part 9 – Other External Hazards**
- **Part 10 – Seismic Margins**

# Licensing

## **10 CFR 52.79 Contents of applications; technical information in final safety analysis report.**

**(a) The application must contain a final safety analysis report (FSAR) that describes the facility, presents the design bases and the limits on its operation, and . . . Shall include the following information, . . .**

- (1) (iii) The seismic, meteorological, hydrologic, and geologic characteristics of the proposed site with appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area and with sufficient margin for the limited accuracy, quantity, and time in which the historical data have been accumulated;**
- (iv) The location and description of any nearby industrial, military, or transportation facilities and routes;**

## **Expectation for COLA**

- Site characteristics are described in sufficient detail to permit independent confirmation that they are bounded by the assumptions made for the generic design
- Where site characteristics are not bounded
  - Risk results and insights from a site-specific analysis are reported in Chapter 19
  - Impact on traditional analysis is reported in other chapters, as appropriate