Industry – NRC Meeting on Early Site Permits

December 5, 2002

Proposed Order of Business

- ESP-3, QA requirements for ESP
- ESP-6, PPE example
- ESP-7, Meeting Section 52.17(a)(1)
- ESP-18a, Alternate site reviews

- ESP-8, Tables S-3 and S-4
- Mitigation alternatives (ESP-6-related issue)
- ESP-12, Severe accident issues
- ESP-11, Duration of ESPs
- ESP-22, NRC findings in an ESP

ESP-3 – What are the QA Requirements for ESP?

- Industry view –
  - Fundamental issue for ESP applicants
  - Differing interpretations of ESP requirements
  - Appendix B not required by regulations and is not the only way to assure quality
- NRC staff view –
  - IMC-2501 statements
  - OGC interpretation pending
- Common understandings needed ASAP

Common Understandings Needed

- ESP applicants are implementing effective quality processes to:
  - Provide confidence in the completeness and accuracy required by 10 CFR 50.9
  - Ensure the overall quality of ESP info to facilitate efficient NRC reviews
- ESP applicants may apply Appendix B or non-Appendix B alternative quality processes to achieve these objectives
  - No specific QA requirements in Section 52.17 for ESP applications
  - ESP activities are not within the scope of Appendix B
  - Lack of specific QA requirements is consistent with the scope of ESP activities
  - Effective alternative quality processes exist and are being used
- ESP applicants may, but are not required by Section 52.17 to describe their quality processes in ESP applications
- Unless the ESP applicant commits to use Appendix B, NRC reviews for compliance with Appendix B would not be appropriate.
- ESP information approved by the NRC is appropriate for use/reference in a COL application as provided by 10 CFR Part 52, Subpart C

ESP-3 Follow-up Actions

- Pilot ESP applicants will submit quality plan descriptions for NRC pre-application information and feedback
- Document ESP-3 common understandings
  - NEI issue resolution letter by Dec.20
  - NRC response by Feb.1
- IMC-2501 and related NRC guidance should reflect that Appendix B is not mandatory for ESP activities

ESP-6 Example

- See separate slide set

ESP-7 – How to meet Section 52.17(a)(1) in the absence of SSCs?

10 CFR 52.17 states in part:

"... The assessment [of the site] must contain an analysis and evaluation of the major SSCs of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in 50.34(a)(1) of this chapter. Site characteristics must comply with part 100 of this chapter."

Meeting Part 100 Requirements

Meeting Section 100.21(c)(2) Requirements	
Design Certification	Establish release history, including source term and mitigation features (e.g., containment)
Early Site Permit	Establish atmospheric dispersion characteristics, χ/Q
Combined License	▪ Integrate design and site characteristics ▪ Determine that dose consequence criteria are met [Sections 100.21(c)(2) and 50.34(a)(1)]

NEI

Common Understandings Needed

- For ESP, χ/Q is THE site characteristic that determines the acceptability of the site
- Calculation of the site χ/Q can reflect
  - Radiological release point
  - Building wake effects
  - Distance to EAB and LPZ boundaries
  - Site meteorological data
  - Atmospheric dispersion models
- Thus Section 52.17(a)(1) is met for ESP by establishing the site χ/Q, which reflects "SSCs … that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in 50.34(a)(1)"
- Consistent with RG 1.145, pilot ESP applicants will assume a ground-level release and no building wake effects; result is a technology independent χ/Q for ESP

Calculating χ/Q for ESP

- RG 1.145 requires assumption of ground level release for all reactor designs being considered by ESP applicants
  - None envision tall (2.5x) vent stack
- Assuming no building wake has little or no impact on χ/Q
  - Building wake effects do not reduce χ/Q values at slow wind speeds and stable atmospheric conditions

Determining Part 100 is Met at COL

- Acceptability of the site/design combination, i.e., meeting Section 100.21(c)(2) radiological requirements, depends on:
  - χ/Q for the site
  - Release history for the design
- If the site χ/Q is less than the corresponding values in a referenced design certification, then the site/design combination meets Part 100 requirements

ESP-18a, Alternate Site Reviews

- Part 52 currently* requires consideration of alternate sites to determine if any is "obviously superior" to that proposed
- NEPA focus is on consideration of reasonable alternatives that would achieve the applicant's objectives
- NUREG-1555 reflects special case when new plants are proposed for existing sites

* Rulemaking petition pending

NEI

Common Understandings Needed

- NRC reviews are expected to focus on alternatives that serve the applicant's purpose, e.g., approval of existing nuclear sites for new nuclear units
- ESP applications will include
  - Evaluation of existing nuclear sites
  - Discussion of generic greenfield and industrial sites to confirm that no obviously superior site exists

Generic ESP Issue – Environmental Impact Mitigation Alternatives

- Industry view –
  - Applicants may identify and evaluate impacts of a range of mitigation alternatives in the ESP
    - Evaluate significance of and differences in impacts
    - If significant differences in impact are identified (environmentally preferred alternative exists), a cost-benefit analysis will be conducted to determine whether an effective mitigation alternative is available.
    - If no environmentally preferable alternative is identified (alternatives are environmentally equivalent), the ESP would impose no constraints on the design selected at COL.
    - If environmental impacts are determined to be minor, detailed cost/benefit evaluation of mitigation alternatives would not be performed

Generic ESP Issue – Environmental Impact Mitigation Alternatives

- Industry view (con't)
  - At COL, if impacts of the selected design are not significantly different from those identified in the ESP, mitigation alternatives would not be further addressed

- NRC staff comments –
  - Mitigation of all effects must be considered, even if they are small
  - Concern on finality of ESP conclusions if detailed impact analysis and evaluation of mitigation alternatives are not provided

Common Understandings Needed

- Where environmental impacts are determined to be minor, detailed evaluation of mitigation alternatives is not necessary

- ESP conclusions regarding environmental impacts and consideration of mitigation alternatives will generally be considered resolved for purposes of future proceedings; circumstances under which further consideration of these matters at COL may be necessary include:

  - Change in the site environs such that an environmental impact evaluated at ESP changes from Minor to Significant
  - Impact of selected design has significantly greater environmental impacts than those evaluated at ESP

ESP-12, NEPA Consideration of Severe Accidents

- Two issues, both design-dependent:
  - Environmental impacts of severe accidents (ESRP 7.2)
  - Severe accident mitigation alternatives (ESRP 7.3)
- Severe accident issues will be addressed at COL to the extent not resolved in a referenced design certification

Severe Accidents Considered in Design Certifications

- Resolved for purposes of future proceedings:

"[A]ll environmental issues concerning severe accident mitigation design alternatives associated with the information in the NRC's final environmental assessment for the [design] … for plants referencing this appendix whose site parameters are within those [of the approved standard design]" [See DCRs and Environmental Assessments]

- COL Information Item on site acceptability for severe accidents, e.g., see ABWR design control document Section 2.2.2:

Demonstrate that PRA results for severe accidents fall within the given goals:

- Individual Risk 0.1% of normal risk
- Societal Risk 0.1% of normal risk
- Probability of 0.25 Sv Whole Body Dose at 0.80 km <10-6 per/yr

Common Understandings Needed

- Design-dependent issues such as severe accidents will not be addressed at ESP
  - Theoretically possible, but highly improbable
- At COL, severe accident issues are resolved:
  - Like all other design issues associated with certified standard designs, by reference to a design certification; or
  - Via technical review and hearing opportunity as part of the COL process

ESP-11, ESP Duration (10-20 Yrs)

Common understandings needed:

- Applicants will request 20 year ESPs
- NRC reviews expected to focus on confirming that ESP applications adequately support requested ESP duration
- Existing requirements provide for later consideration of significant new information, e.g., in a COL that references an ESP