NRC Review of NEI 04-01, Revision D: Draft Industry Guideline for Combined License Applicants Under 10 CFR Part 52

Review of Operational Programs in a Combined License Application

NRC/NEI Public Meeting
June 8-9, 2005

Meeting Topics

NEI 04-01

- Security
- Plant Systems
- Regulatory Treatment of Non-Safety Systems
- Meteorology
- Electrical Power
- Human Factors Engineering
- Probabilistic Risk Assessment

COL Operational Program Review

- Implementation of Operational Programs
- Discussion of Specific Operational Programs
  - Training
  - Operator Training
  - Containment Leak Rate Testing
  - Qualification of Mechanical and Electrical Equipment

Other Topics

- Electronic Submission of Combined License Applications

Preliminary Comments
Security

- 4.3.9.13.3, "Chapter 13 Content Guidance, Industrial Security Information"
  - This section needs to be modified to include a provision for COL applicants to submit a physical security plan that adheres to the format and content of NEI 03-12, "Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan," (generic security plan template).
- Site-Specific Physical Security ITAAC
  - Section 4.3.9.14 (or another as appropriate) needs to be revised to include criteria for developing ITAAC for site-specific physical security features and/or systems (i.e., hardware).

Plant Systems

- Significant information "gap" exits in the content of FSAR sections specified by NEI 04-01, Revision D compared to the content of FSAR sections specified by RG 1.70.
  - Using RG 1.70 Section 3.4.1(Flood Protection) as an example, only 1 out 5 items specified in RG 1.70 is required to be addressed in FSAR according to NEI 04-01, Revision D, Table 4.3.9.3-1.
  - NEI 04-01, Revision D needs to explicitly state that a "pointer" to reference specific applicable DCD sections for each item in RG 1.70 is required in the FSAR.
  - Example (FSAR Section 9.5.1, Fire Protection System) provided by NEI references specific DCD sections in its text and is acceptable. NEI 04-01, Revision D may use any of several formats (e.g., tabular form) to explicitly reference applicable DCD sections as required information in the FSAR.

Plant Systems (continued)

- RG 1.70 general guidance for FSAR Chapters 9 (Auxiliary Systems) and 10 (Power Conversion Systems) states that the capability of the system to function without compromising the safe operation of the plant under normal or transient situations should be clearly shown by the information (e.g., a failure analysis).
  - Using as examples a system which performs safety-related functions from FSAR Chapters 9 and 10, NEI needs to summarize how the RG 1.70 general guidance has been implemented in the reference DCD.
  - NEI needs to explain how design features that affect the initiating frequency of design basis accidents have been addressed (e.g., main feedwater system reliability).

Plant Systems (continued)

- RG 1.70 guidance for FSAR Section 10.4.5 (Circulating Water System) states that the potential for flooding safety-related equipment due to the failure of a system component such as an expansion joint should be discussed.
  - NEI needs to explain how the RG 1.70 guidance has been addressed for the circulating water system in the reference DCD.

Plant Systems (continued)

- For the first interface requirement of sufficient cooling water, NEI needs to explain how the specified ITAAC acceptance criteria associated with elevations of the suction lines for Item 1 can demonstrate that sufficient cooling water will be provided at the plant specific Ultimate Heat Sink (UHS) to satisfy the interface requirement 1.(a) in NEI 04-01, Revision D, Table 4.3.9.14-1
  - There is no information in the DCD nor in the FSAR as specified in Section 4.3.9.9 of NEI 04-01, Revision D to support the adequacy of the acceptance criteria for Items 1.(a) and 1.(b).

Plant Systems (continued)

- NEI 04-01, Revision D, Table 4.3.9.14-3 identifies ABWR Tier 1 interface requirements for the reactor service water system and circulating water system.
  - NEI needs to identify the corresponding site specific ITAAC tables in NEI 04-01, Revision D, Section 4.3.9.14.3.2.

Regulatory Treatment of Non-Safety Systems

- NEI 04-01 does not contain any guidance pertaining to Regulatory Treatment of Non-Safety Systems (RTNSS)

Meteorology

- Compliance/adequate protection issue (general comments)
  - new information (e.g., climatic change)
  - meteorological measurements
- Status of ESP information at COL (Sec. 4.3.9.2.1, p. 37)
- Redundant information (Sec. 4.3.9.2.3, p. 38-39)
- New climatic information (Sec 4.3.9.2.7, p. 40)
- Completion timing code (Table 4.3.9.2-1)
  - external explosions (p. 43)
  - external flammable liquids or vapors (p. 44)
  - external toxic chemicals (p. 44)
  - external fires (p. 44)
  - on-site chemicals (p. 45)

Meteorology (continued)

- New and significant information (Table 4.3.9.2-1, p. 45)
- Cooling tower impacts (Table 4.3.9.2-1, p. 45)
- On-site meteorological program (Table 4.3.9.2-1, p. 46)
- Atmospheric diffusion estimates (Table 4.3.9.2-1)
  - short-term (p. 47)
  - long-term (p. 48)

Electrical Power

- Grid Stability/Reliability
- Environmental Qualification of Electrical Equipment
- Station Blackout
- Lighting
- Regulatory Guides and Standards Applicable
- Uninterruptible Power Supply System

Implementation of Operational Programs By a COL Applicant/Licensee

See separate slide package

Operational Programs

Training/Operator Training Programs

- Included in Standard Review Plan Sections 13.2.1 & 13.2.2
- NRC evaluating what information needed to fully describe nonlicensed training of plant staff as well as operator training
- Current operating plant SARs do not provide adequate information to evaluate training of licensed and nonlicensed plant staff
- NRC staff to discuss following topics with INPO
  - Expectations for accreditation of new reactors?
  - What is the expected time line for accreditation?
  - What type of assessments would INPO perform?
  - What if the new reactor is built at an already accredited site?

Operational Programs

Implementation of Training/Operator Training Programs

- At the time of application, the NRC expects the applicant to provide:
  - Commitments to training related Regulatory Guides, NUREGs, and industry standards (current revisions of RG 1.8, RG 1.134, RG 1.149, NUREG 1021, NUREG 1122, NUREG 1123, ANSI 3.1, ANSI 3.4, ANSI 3.5)
  - Licensed and non-licensed training program descriptions, objectives, qualification and training requirements, a decision whether to pursue accreditation, and a schedule for implementation of the training programs
  - A schedule for construction and testing of the simulation facility
  - A commitment that the entire plant staff will be trained and qualified before the initial fuel loading.

Operational Programs

Implementation of Training/Operator Training Programs (continued)

- A commitment to conduct an initial fire protection training program and for training those responsible for developing and implementing the fire protection program.
- The plans for conducting a position task analysis for persons in each position to provide assurance that the tasks can be effectively carried out.
- A description for training emergency response personnel employees in the event of a radiological emergency.
- The proposed means for evaluating the training program effectiveness.

Operational Programs

Implementation of Training/Operator Training Programs (continued)

- Eighteen months before fuel load, the NRC expects:
  - 10 CFR 50.120 training programs designed, implemented, and maintained
  - Licensed operator training program designed, implemented, and maintained
- Six months prior to fuel load, the NRC expects:
  - Operator licenses issued

Operational Programs

Implementation of Training/Operator Training Programs (continued)

- Prior to issuance of the late stage operating license, the NRC expects:
  - The licensed operator requalification program to have been designed, implemented, and maintained
  - For programs not covered under 10 CFR 50.120, the course description, the duration of the course, the organization teaching the course or supervising instruction, and the positions for which the course is given. The program will distinguish between classroom training and on-the-job training, and before and after the initial fuel loading.

Operational Programs

Implementation of Training/Operator Training Programs (continued)

- A description of the training exemption process.
- A description of the fire protection training and retraining program.
- A description of the results of the position's task analysis and the program as implemented.
- A description of radiological emergency training and exercises.
- A description of the means for evaluating the training program effectiveness for each employee.

Operational Programs

Containment Leak Rate Testing

- Governing Implementation Regulation
  - Appendix J to 10 CFR Part 50
- Applicable Standard Review Plan Section
  - 6.2.6
- Information Needed to be Included in Combined License Application to Facilitate NRC Staff Review
  - Operational program will probably not be fully developed at time of COL application. There should be a discussion of applicant's choice to follow Option A or B of App. J, and (for Option B) commitment to implementing guidance document (e.g., Reg Guide 1.163).
  - High-level description of containment leakage rate testing program (similar to what was traditionally provided in PSARs, but with as much additional detail as feasible at the COL stage).

Operational Programs

Containment Leak Rate Testing (continued)

- Supplemental Information Made Available by the Applicant for the Staff to Review the Acceptability of an Operation Program
  - Detailed description of containment leakage rate testing program, at the level requested by SRP 6.2.6, including tables of all containment isolation valves and penetrations, and their testing provisions.

Operational Programs

Qualification of Mechanical and Electrical Equipment

- Governing Implementation Regulation
  - 10 CFR 50.49
- Applicable Standard Review Plan Section
  - 3.11
- Information Needed to be Included in Combined License Application to Facilitate NRC Staff Review
  - COL applicant should provide a description of its equipment qualification (EQ) program and discussion of its implementation
  - SAR should describe the applicants EQ program for the design and construction phase including the EQ master list of electrical and mechanical equipment important to safety

Operational Programs

Qualification of Mechanical and Electrical Equipment (continued)

- Supplemental Information Made Available by the Applicant for the Staff to Review the Acceptability of an Operation Program
  - Detailed description of the EQ master list and supporting documentation/analyses including component evaluation worksheets and EQ test reports for all equipment submitted to the staff.

(Note: During its review, the staff will audit the central EQ file and conduct a plant site visit.)

Human Factors Engineering

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Human Factors Engineering

Preliminary Comments

- Section 4.3.9.1, FSAR Chapter 1, Introduction and General Plant Description
  - The need for not updating information is unclear.
- Section 4.3.9.13, 133, Table*
  - Title confusing as written.
- Section 4.3.9.13, 136, 4.3.9.13.2
  - Possible inappropriate criterion.

*comments identified by NEI 04-01 section number, page number, and location on page (subsection, paragraph, or table)

Human Factors Engineering

Preliminary Comments (continued)

- 4.3.9.13, 137, 4.3.9.13.3
  - Potential inappropriate use of past practice related to staffing.
- 4.3.9.18, 193, "General Comment"
  - Applicability of guidance beyond AP1000.
- 4.3.9.18, 193, Title
  - Section title should be changed.

Human Factors Engineering

Preliminary Comments (continued)

- 4.3.9.18, 193, "Background"
  - Use of 12 elements for human factors engineering (HFE) review applies only to AP-1000.
- 4.3.9.18, 193, "Background"
  - Possible incorrect assumption on guidance adaptability.
- 4.3.9.18, 193, 1
  - First paragraph emphasizes human system interface (HSI) design as focus of HFE. HFE encompasses more than HSI design.

Human Factors Engineering

Preliminary Comments (continued)

- 4.3.9.18, 193, 3
  - No mention of minimum inventory.
- 4.3.9.18, 193, 6
  - Adaptability of guidance to other standard designs.
- 4.3.9.18, 194, COL Item
  - Clarification of NRC guidance.

Human Factors Engineering

Preliminary Comments (continued)

- 4.3.9.18, 194, COL Item
  - Clarification of NRC guidance.
- 4.3.9.18, 195,196, COL Item
  - Design of EOF should be in accordance with HFE program.
- 4.3.9.18, 196, "Operating Experience Review" (OER)
  - Application of OER is too limited.

Human Factors Engineering

Preliminary Comments (continued)

- 4.3.9.18, 197, Top paragraph
  - Explain "...limited to critical concerns."
- 4.3.9.18, 197, "Functional Requirements Analysis and Functional Allocation"
  - Need for additional functional analysis.
- 4.3.9.18, 197, 4.3.9.18.4
  - Reference to Westinghouse-specific task analysis process.

Human Factors Engineering

Preliminary Comments (continued)

- 4.3.9.18, 198, COL Application Guidance, A and B, and ITAAC
  - ITAAC for task analysis not completed should be retained.
- 4.3.9.18, 199, 200, "Staffing and Qualifications"
  - Guidance for compliance; none for exemption.
- 4.3.9.18, 200, 201, "Human Reliability Analysis"
  - Clarify "narrowly-focused ITAAC."

Human Factors Engineering

Preliminary Comments (continued)

- 4.3.9.18, 200, 201, "Human Reliability Analysis"
  - Clarify COL Item 18.7-1.
- 4.3.9.18, 202 – 204, "Procedure Development", paragraphs 3, 4.
  - Clarify "well-known obstacles to effective performance measurement."
- 4.3.9.18, 202, "Procedure Development"
  - Clarify use of paper-based procedures.

Human Factors Engineering

Preliminary Comments (continued)

- 4.3.9.18, 202, "Procedure Development"
  - Paper procedures as "back-up."
- 4.3.9.18, 206, 207, "Human Factors Verification and Validation"
  - Part of V & V Program is not addressed.
- 4.3.9.18, 207, "Design Implementation"
  - Clarify applying the design implementation element.

Human Factors Engineering

Preliminary Comments (continued)

- 4.3.9.18, 207, "Design Implementation"
  - Change to reference is needed.
- 4.3.9.18, 206, 207, COL Application Guidance A
  - Clarification of responsibility for V&V is needed.
- 4.3.9.18, 207, "Human Performance Monitoring"
  - Clarify terminology.

Probabilistic Risk Assessment

See separate slide package