



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 11, 2009

MEMORANDUM TO: Lois M. James, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: G. Edward Miller, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF FEBRUARY 24, 2009, CATEGORY 2 PUBLIC MEETING
REGARDING DEVELOPMENT OF INTERIM STAFF GUIDANCE ON
THE DIGITAL INSTRUMENTATION AND CONTROL SYSTEM
UPGRADE LICENSING PROCESS

On February 24, 2009, the Nuclear Regulatory Commission (NRC) staff conducted a Category 2 public meeting to discuss the development of guidance for the staff in the Office of Nuclear Reactor Regulation regarding the licensing process for digital instrumentation & control (I&C) upgrades. A notice for this meeting was issued on February 11, 2009, and is available in the Agencywide Documents Access and Management System under Accession No. ML090420093. The attendance sheet is included as Enclosure 1 to this memorandum.

The purpose of this meeting was to foster an open discussion of the membership of the NRC and industry participants, format for further discussions, and the initial concept for the guidance.

The meeting was opened by a discussion of the background and objectives of the guidance. Additionally, a short conceptual overview of the interim staff guidance was given where the application and review process would have multiple phases where the NRC staff would receive the information available, recognizing that some currently unavailable information would be forthcoming from the licensee. Additionally, this process would allow for interim feedback to reduce regulatory uncertainty.

Following this discussion, Mike Schoppman, from the Nuclear Energy Institute (NEI), proposed that, through NEI, interested stakeholders would consolidate comments on the draft interim staff guidance (ISG) and provide them in writing prior to the conference calls planned for every second Tuesday of the month. The NRC staff agreed that this method of providing comments would be effective.

Following the discussion of the feedback methods, individual items from the current list of comments tendered by NEI were addressed. At the conclusion of the discussions, it was noted that a revised list of comments, based upon the latest version of the draft ISG would be provided in support of the next conference call (scheduled for March 10, 2009). The next public meeting is scheduled for March 24, 2009.

At the conclusion of these discussions, the meeting was opened for public comments. No public comments were received.

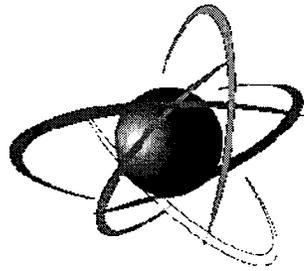
Please direct any inquiries to me at 301-415-2481, or ed.miller@nrc.gov.

A handwritten signature in black ink, appearing to read "G. Edward Miller". The signature is stylized with a large initial "G" and a long, sweeping underline.

G. Edward Miller, Project Manager
Plant Licensing Branch I-2
Division of Operating reactor Licensing
Office of Nuclear Reactor Regulation

Enclosures:

1. List of Attendees
2. Presentation Slides
3. NEI Comments

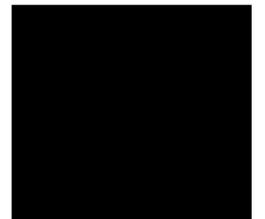


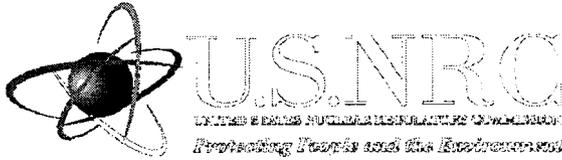
U.S. NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Digital I&C Licensing Process Task Working Group-6

February 24, 2009

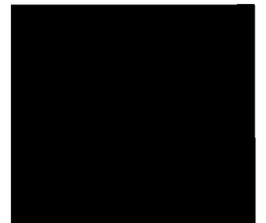
Ed Miller, Project Manager
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

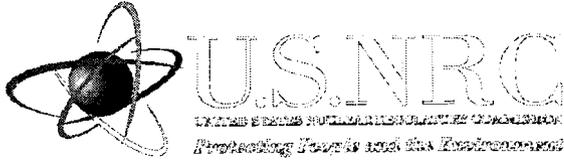




Digital I&C Licensing Process

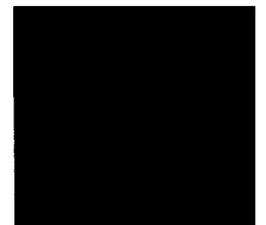
- Agenda
 - Introduction of Participants and Review of ISG-6 Objectives
 - Licensing Process
 - Review Area: V&V
 - Review Area List
 - Schedule
 - Public Comments

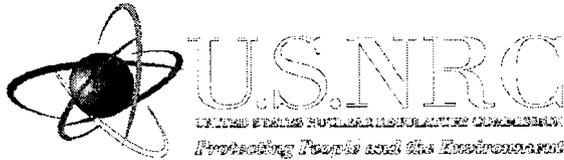




Digital I&C Licensing Process

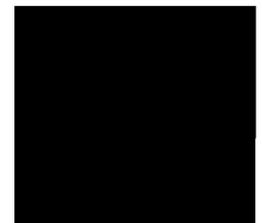
- Introduction of Participants
- Objectives of ISG-6
 - Clearly defined licensing process
 - Expectations for documentation





Digital I&C Licensing Process

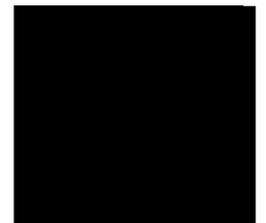
- Licensing Process
 - Process Overview
 - Initial Application
 - Continued Review and Audit
 - Implementation and Inspection
 - Review Areas
 - Scope of Review
 - Pre-Application Meetings
 - Information to be Provided
 - Regulatory Evaluation
 - Technical Evaluation
 - Conclusion
 - Appendices (Example Formats)

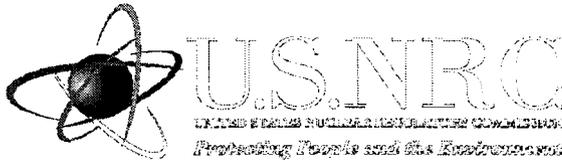




Digital I&C Licensing Process

- Review Area: V&V
 - Scope of Review
 - Information to be Provided
 - Regulatory Evaluation
 - Technical Evaluation
 - Conclusion
- Review Area List

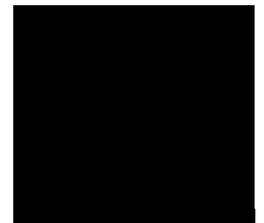




Digital I&C Licensing Process

- Schedule

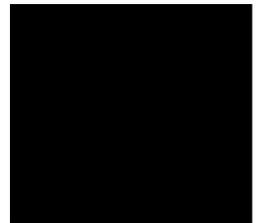
- Conference Call, March 10, 2009 to discuss status.
- Public Meeting, March 24, 2009, to discuss comments on draft process and review areas & Present 2~4 additional draft review areas.
- Conference Call, April 14, 2009 to discuss status.
- Public Meeting, April 28, 2009, to discuss outstanding issues on previous review areas & Present 2~4 additional draft review areas.





Digital I&C Licensing Process

- Public Comments



NEI Comment Matrix
Reference: NRC ISG-6

#	MEETING DATE	SECTION	COMMENT	ACTION/RESPONSIBILITY	STATUS	DISPOSITION
1*	27-Jan-09	General	<u>CROSS-REFERENCING</u> - Consider formatting ISG-6 by topic rather than by compliance to individual clauses in IEEE standards. OR, discuss feasibility of cross-reference Table. See file <i>NEI-001</i> . Titles of documents by themselves don't provide applicants any insights regarding what has to be in the submittal and why.			
2*	27-Jan-09	General	<u>POST SE ACTIVITIES</u> - Describe the timing and SE documentation of future actions. Permit license conditions, commitments, or inspections for downstream activities such as completion of design, validation and verification, and factory acceptance testing (see file <i>NEI-002</i> ; RS-001; LIC-101; comment #18).			
3	27-Jan-09	General	<u>PHASE CLOSURE</u> - Clarify the tracking of the four phases. For example, explain that the review (Phase 2) can begin before all acceptance review items (Phase 1) are fully resolved. Reference NRC Review Standard RS-001.			
4	27-Jan-09	General	<u>MEETING SUMMARIES</u> - NRR add a note to each meeting summary letter that parties to the meeting can submit comments on the summary.			
5	27-Jan-09	General	<u>INCORPORATION BY REFERENCE</u> - Add words on how LAR applicants should use and reference IEEE (or other) standards that are newer than those incorporated by reference in current regulations (exemption vs. request for relief or alternative).			NRC position - IEEE 603-1998 is equivalent to IEEE 603-1991. Licensee may use this as the basis for 10 CFR 50.55a(a)(3)(i) relief requests.
6	27-Jan-09	General	<u>PUBLIC AVAILABILITY OF INTERNAL NRC GUIDANCE</u> - Whenever an internal NRC document is referenced, state whether it is publicly available.			

NEI Comment Matrix
Reference: NRC ISG-6

#	MEETING DATE	SECTION	COMMENT	ACTION/RESPONSIBILITY	STATUS	DISPOSITION
7	27-Jan-09	General	<u>CROSS-REFERENCING</u> - Cross reference ISG-6 to BTP 7-19.			
8	27-Jan-09	General	<u>TECH SPECS</u> - Discuss how to include the subject of Tech Specs in ISG-6			
9	27-Jan-09	General	<u>TOPICAL REPORTS</u> - Discuss how Topical Reports can be used in the digital I&C licensing process.			
10*	27-Jan-09	General	<u>TERMS & DEFINITIONS</u> - Continue the dialogue on key terms and definitions (e.g., best estimate, realistic, precedent, adequate assurance, Appendix B document lists, etc.).			2/10 Telecon: T&D to be added when the parties determine they are needed.
11*	27-Jan-09	General	<u>DOCKETED DOCUMENTS vs. INFORMATION AVAILABLE FOR INSPECTION</u> - Discuss which complete documents must be docketed rather than extracting pieces of information and making them available for review/audit in some other manner. To what extent does this choice affect post-SE change management?			
12	27-Jan-09	General	<u>PRECEDENT</u> - Define precedent. Develop a protocol for the use of precedent. Reference NRC Review Standard RS-001.			

NEI Comment Matrix
Reference: NRC ISG-6

#	MEETING DATE	SECTION	COMMENT	ACTION/RESPONSIBILITY	STATUS	DISPOSITION
13	27-Jan-09	C.1 Process Overview, 1st ¶, 2nd sentence	<u>PRE-SUBMITTAL MEETINGS</u> - Clarify the means (letter, e-mail, phone call, etc.) by which an applicant may initiate a pre-submittal meeting.			
14*	27-Jan-09	C.1 Process Overview, 5th ¶, 1st sentence	<u>CHANGE MANAGEMENT</u> - Define and provide examples of a "deviation" from a previous approved platform. References LIC-101 and LIC-500. The question of a 50.59-like process for Topical Reports is under discussion between the NEI LATF Topical Report Team and the NRC.			
15	27-Jan-09	C.2 Pre-application, 1st ¶, 2nd sentence	<u>TERMS & DEFINITIONS</u> - Provide examples of "unique or complex topics associated with the proposed design."			
16	27-Jan-09	C.3 Initial Application, 2nd ¶	<u>CROSS-REFERENCING</u> - Recommend mapping the subject areas listed in this section to the associated regulations, standard review plan sections, regulatory guides, etc.			
17*	24-Feb-09	Appendix B.1	<u>DOCUMENTATION</u> - See file <i>NEI-003.doc</i> for a Redline/Strikeout of Appendix B.1 (Documents for a Tier 1 Review).			
18*	24-Feb-09	Appendices B.1 and B.2	<u>DOCUMENTATION</u> - See file <i>NEI-004</i> for comments on Appendix B.1 (Documents for a Tier 1 Review) and Appendix B.2 (Documents for a Tier 2 Review).			
19*	24-Feb-09	General	<u>POST-SE ACTIVITIES</u> - See file <i>NEI-005</i> for examples in RS-001 of license conditions and commitments in safety evaluations.			

* = High Priority

NEI Comment Matrix
Reference: NRC ISG-6

#	MEETING DATE	SECTION	COMMENT	ACTION/RESPONSIBILITY	STATUS	DISPOSITION
20	24-Feb-09	General	<u>INDUSTRY GUIDELINES</u> - Discuss feasibility of revising NEI 01-01, Revision 1, "Guidelines on Licensing Digital Upgrades (EPRI TR-102348)."			Need internal Industry discussions first.
21*	24-Feb-09	Appendix B	<u>SCOPE OF SUBMITTAL</u> - The C.1 discussion of Tier 1 is not consistent with the information requirements in Appendix B.1. Tier 1 relies on previous reviews, but B.1 has 11 documents that must be submitted to the NRC with the application. These documents would have been considered to some degree during the Topical Report phase (see <i>NEI-003</i>).			
22*	24-Feb-09	Appendix B	<u>SCOPE OF SUBMITTAL</u> - Why are the lists in B.1, B.2, and B.3 different? For example, FMA is in B.2, but not B.1. What does the NRC need, why is it needed, and when is it needed?			
23	24-Feb-09	Section D.2.2	<u>V&V INFORMATION</u> - Need a citation to a specific clause in 7-4.3.2. Why is this topic area limited to V&V rather than software quality in general?			
24	24-Feb-09	Section D.2.3	<u>V&V REGULATORY EVALUATION</u> - The section as written is quite general. Can it be revised to provide crisp guidance on what constitutes "reasonable assurance."			
25*	24-Feb-09	General	<u>CROSS-REFERENCING</u> - The Industry would benefit from a master table of all the documents involved in the regulatory review of a digital LAR. The table would show the extent to which the NRC needs the information in each document and when that information is needed.			

NEI Comment Matrix
Reference: NRC ISG-6

#	MEETING DATE	SECTION	COMMENT	ACTION/RESPONSIBILITY	STATUS	DISPOSITION
26*	24-Feb-09	General	<u>CROSS-REFERENCING</u> - ISGs need to be consistent with respect to "beyond the design basis." For example, ISG-2 compared to ISG-6			
27*	24-Feb-09	Section D.1.1	<u>CONSISTENCY WITH OTHER ISGs</u> - The first paragraph (defense in depth) is inconsistent with ISG-2, Section 6, Staff Position.			
28*	24-Feb-09	Section D.1.3	<u>CONSISTENCY WITH OTHER ISGs</u> - D.1.3 discusses single failure, but does not state that CCF is beyond design basis and is not considered to be a single failure per IEEE 603 or 379. This section should make the same clarification provided in ISG-2.			
29*	24-Feb-09	Section D.1.2	<u>CONSISTENCY WITH OTHER ISGs</u> - The 5th bullet (RPS/ESFAS discussion) is inconsistent with ISG-2, Section 6, Staff Position.			

Cross-referencing IEEE-698/7-4.3.2 with ISG-6

IEEE STANDARD CLAUSES		ISG-6 TOPIC AREAS			
Hardware IEEE 603-1998	Software IEEE 7-4.3.2	D.1	D.2	D.3	Etc.
Action A _H	Action A _S	X			
Action B _H	Action B _S			X	
Action C _H	Action C _S		X		
Etc.					

Additional Dimensions are:

- Which Tier (1, 2, or 3)
- When (Phases 0, 1, 2, or 3)
- Who (vendor or licensee)
- The extent to which a particular Topical Report covers all the areas

BACKGROUND

NRC approvals of recent licensing actions have included license conditions or regulatory commitments for actions to be completed after the approval has been issued.

For example –

1. NRC approvals of renewed facility operating licenses include license conditions to conduct certain aging management activities after the licenses are issued and prior to entering the period of extended operation.
2. NRC approvals of extended power up rates (EPU) include license conditions and/or regulatory commitments to complete certain actions post-approval – for example where the plant modifications occur over several years after initial approval.

NRC internal guidance permits the use of either license conditions or commitments to ensure that future actions are taken. License conditions are reserved for those matters that are safety significant. Regulatory commitments are used for other matters of lesser significance.

For LARs that apply to a multi-unit station, license conditions or commitments would be used to ensure subsequent unit activities are equivalent to or exceed those of the initial unit that was reviewed and approved.

In some cases, NRC has had licensees submit additional LARs to cover installation of a licensing action on subsequent units at the same site. This is not a preferred approach for digital I&C licensing actions.

Industry seeks NRC agreement to use these acceptable regulatory tools during the digital I&C licensing process for operating plants in order to obtain NRC approval of a system design as early in the life-cycle as possible.

PROPOSAL

License Conditions

License conditions for digital I&C licensing actions should be reserved for those matters that are safety significant.

The following are options/examples for License Conditions:

1. LC – The Additional Conditions contained in Appendix [B], as revised through Amendment [n] are hereby incorporated into this renewed operating license. [Licensee] shall operate the facility in accordance with the Additional Conditions. *[uses an existing Facility Operating License Appendix]*
2. LC – Digital I&C Protection System Installation – [Licensee] shall provide the following documents by the required date:

Activity / Document	Due Date
1. Equipment Qualification Documentation	[180] days prior to installation in Unit [x].
2. The Factory Acceptance Test for Unit [x] shall be completed and the following documents shall be provided to the NRC: a. Final Test Reports b. Summary of Factory Acceptance Testing (FAT) c. System Test Procedures	[180] days prior to installation in Unit [x].
3. V&V Reports	[180] days prior to installation in Unit [x].

Regulatory Commitments

Commitments managed by the licensee in accordance with its Commitment Management program should be reserved for all other matters. For matters of lesser safety significance, the SE would list the regulatory commitments as made by the licensee. Examples:

The following documents will be available for NRC inspection prior to Unit [x] start-up:

1. Completed FAT Procedure & Reports
2. Configuration Management Reports
3. Detailed System and Hardware Drawings
4. Final Circuit Schematics
5. Final Software Integration Report
6. Individual Completed Test Procedures & Reports
7. Individual V&V Problem Reports up to FAT
8. Maintenance Manuals
9. Operations Procedures
10. Software Code Listings
11. Training Manuals & Course Material
12. Vendor Build Documentation

The following statement would be included in the SE following the list of regulatory commitments:

“The NRC staff finds that reasonable controls for the implementation and for subsequent evaluation of proposed changes pertaining to the above regulatory commitments are best provided by the licensee’s administrative processes, including its commitment management program. The above regulatory commitments do not warrant the creation of regulatory requirements (items requiring prior NRC approval of subsequent changes).”

Appendix B.1, "Documents for a Tier 1 Review"

Documents Expected Upon Submittal of a Topical Report for NRC Approval

1. System description
 - a. Detail to address ISG-4
 - b. Detail down to block diagram level
2. Design Analysis Report
3. System Description
4. Hardware & Software Architecture Descriptions
5. Preliminary Reliability Analysis
6. Safety Analysis
7. System Requirements
8. System Test Plan
9. Software Life Cycle Documentation
 - a. Software Design Specification
 - b. Software Installation Plan
 - ~~c. Site Software Maintenance Plan~~
 - ~~d. Software Operations Plan~~
 - e. Software Project Risk Management Program
 - f. Application Software Requirements Specification
 - g. Software Safety Plan
 - h. Software Test Plan
 - i. Software Training Plan
10. Requirements Traceability Matrix
11. *Equipment Qualification Methodology/Requirements*

Documents Expected Upon LAR Application

1. Documents as required by the Topical Report Safety Evaluation (Applicant Action Items)
2. D3 Analysis Information (as described in Section D.1.2)

Documents Expected Within 12 Months of Requested Approval (or as required by Applicant Action Items)

1. Final Design Description
2. Final Logic Diagrams
3. Final Reliability Analysis
4. Final System Configuration Documentation
5. Installation Test Plans and Procedures
6. Software Life Cycle Documentation

Documents to be provided as required by License Condition after SE Approval

1. Final Test Reports
2. Summary of Factory Acceptance Testing (FAT)
3. System Test Procedures
4. V&V Reports
5. Equipment Qualification Documentation

Documents to be Available for Audit

1. Completed FAT Procedure & Reports
2. Configuration Management Reports
3. Detailed System and Hardware Drawings
4. Final Circuit Schematics
5. Final Software Integration Report
6. Individual Completed Test Procedures & Reports
7. Individual V&V Problem Reports up to FAT
8. Maintenance Manuals
9. Operations Procedures
10. Software Code Listings
11. Training Manuals & Course Material
12. Vendor Build Documentation

Appendix B.1, "Documents for a Tier 1 Review"

Documents Expected Upon Application

1. D3 Analysis
2. System description
 - a. Detail to address ISG-4
 - b. Detail down to block diagram level
3. Design Analysis Report
4. System Description
5. Hardware & Software Architecture Descriptions
6. Preliminary Reliability Analysis
7. Safety Analysis
8. System Requirements
9. System Test Plan
10. Software Life Cycle Documentation
 - a. Software Design Specification
 - b. Software Installation Plan
 - c. Site Software Maintenance Plan
 - d. Software Operations Plan
 - e. Software Project Risk Management Program
 - f. Application Software Requirements Specification
 - g. Software Safety Plan
 - h. Software Test Plan
 - i. Software Training Plan
11. Requirements Traceability Matrix
12. Equipment Qualification Documentation

Note that these three documents were not required for the Oconee project.

This may require complete equipment selection at an early stage.

Documents Expected Within 12 Months of Requested Approval

1. Final Design Description
2. Final Logic Diagrams
3. Final Reliability Analysis
4. Final System Configuration Documentation
5. Final Test Reports
6. Installation Test Plans and Procedures
7. Summary of Factory Acceptance Testing (FAT)
8. System Test Procedures
9. Software Life Cycle Documentation
10. V&V Reports

Not required for Oconee.

These documents would require completion of manufacturing and FAT 12 months before LAR approval. This standard creates an unworkable time line for retro-fit projects.

Documents to be Available for Audit

1. Completed FAT Procedure & Reports
2. Configuration Management Reports
3. Detailed System and Hardware Drawings
4. Final Circuit Schematics
5. Final Software Integration Report

Documents to be Available for Audit (Continued)

6. Individual Completed Test Procedures & Reports
7. Individual V&V Problem Reports up to FAT
8. Maintenance Manuals
9. Operations Procedures
10. Software Code Listings
11. Training Manuals & Course Material
12. Vendor Build Documentation

Appendix B.2, "Documents for a Tier 2 Review"

Documents Expected Upon Application

1. Commercial Grade Dedication Plan If applicable
- D37 2. De analysis (Including system modifications and plant specific architecture and use)
3. System description
 - a. Detail to address ISG-4
 - b. Detail down to block diagram level
4. Design Analysis Report
5. Design Report on Computer Integrity, Test and Calibration, and Fault Detection
6. Theory of Operation Description
7. Equipment Qualification Testing Plans (Including EMI, Temperature, Humidity, and Seismic to the degree to which these are affected by the plant specific application)
8. Software QA Plan and Procedures
9. System Description
10. Hardware & Software Architecture Descriptions
11. Preliminary Failure Mode Effects Analysis (FMEA)
12. Preliminary Reliability Analysis
13. Safety Analysis
14. System Requirements
15. System Test Plan
16. Software Life Cycle Documentation
 - a. Site Software CM ←
 - b. Software Design Specification
 - c. Software Development Plan
 - d. Site Software Maintenance Plan
 - e. Software Operations Plan
 - f. Application Software Requirements Specification
 - g. Software Safety Plan
 - h. Software Test Plan
 - i. Software Training Plan
17. Requirements Traceability Matrix

Only to the degree that anything changes from the Topical Report.

Why different than tier 1?

Documents Expected Within 12 Months of Requested Approval

1. Commercial Grade Dedication Report ←
2. Commercial Grade Dedication Procedures ←
3. Final Design Description ←
4. Final FMEA ←
5. Final Logic Diagrams
6. Final Reliability Analysis
7. Final Report on Acceptance of Commercial Grade Dedication ←
8. Final System Configuration Documentation
9. Final Test Reports ←

If applicable

This document would require completion of manufacturing and FAT 12 months before LAR approval. This standard creates an unworkable time line for retro-fit projects.

Documents Expected Within 12 Months of Requested Approval (Continued)

- 10. Installation Test Plans and Procedures
- 11. Operations Manuals
- 12. Summary of Final Environmental Qualification Testing
- 13. Summary of Factory Acceptance Testing (FAT)
- 14. Installation Test Plans
- 15. System Test Procedures
- 16. Software Life Cycle Documentation
- 17. Software Life Cycle Documentation
 - a. Software management implementing Procedures
 - b. Software Project Risk management Report
 - c. Software Test Procedures
 - d. Software Tool Analysis Report
- 18. V&V Reports

These documents would require completion of manufacturing and FAT 12 months before LAR approval. This standard creates an unworkable time line for retro-fit projects.

Only to the degree that anything changes from the Topical Report.

Not required for Oconee.

Not described in BTP 7-14

Documents to be Available for Audit

- 1. Completed FAT Procedure & Reports
- 2. Configuration Management Reports
- 3. Detailed System and Hardware Drawings
- 4. Final Circuit Schematics
- 5. Final Software Integration Report
- 6. Individual Completed Test Procedures & Reports
- 7. Individual V&V Problem Reports up to FAT
- 8. Software Code Listings
- 9. Vendor Build Documentation

Why different than tier 1?



OFFICE OF NUCLEAR REACTOR REGULATION

REVIEW STANDARD FOR
EXTENDED POWER UPRATES

APPROVED BY: /RA/

L. Marsh, Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

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(301) 415-2859
mas4@nrc.gov

RS-001, Revision 0
DECEMBER 2003

- (5) Based on the results of the technical review performed in accordance with Section 2.1 of this review standard, if a technical area is determined to not be applicable or necessary for the plant under review, keep that section's heading in the safety evaluation, delete the "Regulatory Evaluation" and "Conclusion" sections for that area, and discuss the reasons why a review of that particular technical area is not needed.
- (6) Summarize the technical review and findings in the appropriate "Technical Evaluation" section of the safety evaluation.
- (7) Discuss independent calculations performed to support the review in the appropriate "Technical Evaluation" section of the safety evaluation.
- (8) Review the "Conclusion" sections of the safety evaluation and modify them, as necessary, to reflect the conclusions reached as a result of the review. If a "Conclusion" section summarizes more than one technical evaluation, include an intermediate conclusion in each technical evaluation (e.g., see Section 2.2.2 of Insert 2 for RS-001 Section 3.2 - BWR Template Safety Evaluation).
- (9) Identify areas for consideration by the NRC's inspection staff in the "Recommended Areas for Inspection" section of the safety evaluation. Each area identified should include a rationale. The identified areas are not intended to be inspection requirements, but are provided to give the inspectors insight into important bases for approving the EPU.
- (10) Generate a detailed table of contents for the final plant-specific safety evaluation. The detailed table of contents should include a listing of all areas addressed within each insert.
- (11) Modify, as necessary, the acronym list that is attached to the template safety evaluation to ensure that it accurately reflects the acronyms defined in the plant-specific safety evaluation.

It may be necessary to modify the license to include license conditions to capture certain future licensee actions discussed in the EPU application. These actions are typically included as commitments in the EPU application and may include things such as plant modifications, analyses, and updates to licensee-controlled documents. In addition, in cases where a licensee proposes to implement the EPU in multiple stages, it may be appropriate to modify the license to include license conditions to limit plant operation to lower than the full EPU power level pending completion of certain actions. To determine if such actions are appropriate for inclusion in the license as license conditions, refer to the guidance in NRR Office Instruction LIC-101, "License Amendment Review Procedures."

For EPUs to be implemented in one stage, the PM should consider including conditions in the implementation section of the amendment to appropriately capture near-term licensee actions meeting the threshold for inclusion in the license as license conditions.

For EPUs to be implemented in multiple stages, the PM should consider including conditions in the license to appropriately capture longer-term licensee actions meeting the threshold for inclusion in the license as license conditions. Including these actions in the license is appropriate due to the licensee's extended schedule for implementing the EPU.

1.3 Licensee's Approach

The licensee's application for the proposed EPU follows the guidance in the Office of Nuclear Reactor Regulation's (NRR's) Review Standard (RS)-001, "Review Standard for Extended Power Uprates," to the extent that the review standard is consistent with the design basis of the plant. Where differences exist between the plant-specific design basis and RS-001, the licensee described the differences and provided evaluations consistent with the design basis of the plant. The licensee also used **[Identify topical reports or other documents used by the licensee for guidance related to the scope of the proposed EPU; NRC staff approvals, ranges of applicability, any limitations/restrictions associated with the documents; and consistency of the licensee's application with the ranges of applicability and limitations/restrictions. The discussion in this section is to cover topical reports and other documents referenced for the overall power uprate process. It is not intended to cover topical reports and other documents for specific methods of analyses. Topical reports and other documents referenced for specific methods of analyses are to be covered in the applicable technical evaluation section of this safety evaluation].**

Insert this sentence if the licensee is planning to implement the EPU in one stage.

[The licensee plans to implement the EPU in one step. The licensee plans to make the modifications necessary to implement the EPU during the refueling outage in [season year (e.g., fall 2003)]. Subsequently, the plant will be operated at [##] MWt starting in Cycle [##].]

Insert this paragraph if the licensee is planning to implement the EPU in stages:

[The licensee plans to implement the EPU in [#] steps of [## and ##] percent. The licensee plans to make modifications necessary to implement the first step during the refueling outage in [season year (e.g., fall 2003)]. Subsequently, the plant will be operated at [##] MWt during Cycle [##]. The remainder of the modifications will be completed during the refueling outage in [season year (e.g., fall 2003)], with subsequent operation at [##] MWt starting in Cycle [##].]

1.4 Plant Modifications

The licensee has determined that several plant modifications are necessary to implement the proposed EPU. The following is a list of these modifications and the licensee's proposed schedule for completing them.

[Provide a list of plant modifications.]

The NRC staff's evaluation of the licensee's proposed plant modifications is provided in Section 2.0 of this safety evaluation.

4.0 REGULATORY COMMITMENTS

Insert the following sentence if the licensee has not made any regulatory commitments in support of the EPU.

The licensee has made no regulatory commitments in its application for the EPU.

Insert the following if the licensee has made regulatory commitments in support of the EPU.

The licensee has made the following regulatory commitment(s):

[Provide a summary of each regulatory commitment made by the licensee.]

The NRC staff finds that reasonable controls for the implementation and for subsequent evaluation of proposed changes pertaining to the above regulatory commitment(s) are best provided by the licensee's administrative processes, including its commitment management program. The above regulatory commitments do not warrant the creation of regulatory requirements (items requiring prior NRC approval of subsequent changes).

5.0 RECOMMENDED AREAS FOR INSPECTION

As described above, the NRC staff has conducted an extensive review of the licensee's plans and analyses related to the proposed EPU and concluded that they are acceptable. The NRC staff's review has identified the following areas for consideration by the NRC inspection staff during the licensee's implementation of the proposed EPU. These areas are recommended based on past experience with EPUs, the extent and unique nature of modifications necessary to implement the proposed EPU, and new conditions of operation necessary for the proposed EPU. They do not constitute inspection requirements, but are intended to give inspectors insight into important bases for approving the EPU.

[Provide list of recommended areas for inspection.]

6.0 STATE CONSULTATION

In accordance with the Commission's regulations, the **[Name of State]** State official was notified of the proposed issuance of the amendment. The State official had **[no]** comments. **[If comments were received, address them here.]**

7.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, 51.33, and 51.35, a draft Environmental Assessment and finding of no significant impact was prepared and published in the *Federal Register* on **[Date]** (**FR**). The draft Environmental Assessment provided a 30-day opportunity for public comment. *If no comments were received, use the following sentence: [No comments were received on the draft Environmental Assessment.] If comments were received, use the following sentence: [The NRC staff received comments which were addressed in the final environmental assessment.]* The final Environmental Assessment was published in the *Federal Register* on **[Date]** (**FR**). Accordingly, based upon the environmental

2.12 Power Ascension and Testing Plan

2.12.1 Approach to EPU Power Level and Test Plan

Regulatory Evaluation

The purpose of the EPU test program is to demonstrate that SSCs will perform satisfactorily in service at the proposed EPU power level. The test program also provides additional assurance that the plant will continue to operate in accordance with design criteria at EPU conditions. The NRC staff's review included an evaluation of: (1) plans for the initial approach to the proposed maximum licensed thermal power level, including verification of adequate plant performance, (2) transient testing necessary to demonstrate that plant equipment will perform satisfactorily at the proposed increased maximum licensed thermal power level, and (3) the test program's conformance with applicable regulations. The NRC's acceptance criteria for the proposed EPU test program are based on 10 CFR Part 50, Appendix B, Criterion XI, which requires establishment of a test program to demonstrate that SSCs will perform satisfactorily in service. Specific review criteria are contained in SRP Section 14.2.1.

Technical Evaluation

[Insert technical evaluation. The technical evaluation should (1) clearly explain why the proposed changes satisfy each of the requirements in the regulatory evaluation and (2) provide a clear link to the conclusions reached by the NRC staff, as documented in the conclusion section.]

Conclusion

The staff has reviewed the EPU test program, including plans for the initial approach to the proposed maximum licensed thermal power level, transient testing necessary to demonstrate that plant equipment will perform satisfactorily at the proposed increased maximum licensed thermal power level, and the test program's conformance with applicable regulations. The staff concludes that the proposed EPU test program provides adequate assurance that the plant will operate in accordance with design criteria and that SSCs affected by the proposed EPU, or modified to support the proposed EPU, will perform satisfactorily in service. Further, the staff finds that there is reasonable assurance that the EPU testing program satisfies the requirements of 10 CFR Part 50, Appendix B, Criterion XI. Therefore, the NRC staff finds the proposed EPU test program acceptable.

Power Upgrades," to the extent that the review standard is consistent with the design basis of the plant. Where differences exist between the plant-specific design basis and RS-001, the licensee described the differences and provided evaluations consistent with the design basis of the plant. The licensee also used **[Identify topical reports or other documents used by the licensee for guidance related to the scope of the proposed EPU; NRC staff approvals, ranges of applicability, any limitations/restrictions associated with the documents; and consistency of the licensee's application with the ranges of applicability and limitations/restrictions. The discussion in this section is to cover topical reports and other documents referenced for the overall power uprate process. It is not intended to cover topical reports and other documents for specific methods of analyses. Topical reports and other documents referenced for specific methods of analyses are to be covered in the applicable technical evaluation section of this safety evaluation].**

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Insert this paragraph if the licensee is planning to implement the EPU in stages:
[The licensee plans to implement the EPU in [#] steps of [## and ##] percent. The licensee plans to make modifications necessary to implement the first step during the refueling outage in [season year (e.g., fall 2003)]. Subsequently, the plant will be operated at [##] MWt during Cycle [##]. The remainder of the modifications will be completed during the refueling outage in [season year (e.g., fall 2003)], with subsequent operation at [##] MWt starting in Cycle [##].]

1.4 Plant Modifications

The licensee has determined that several plant modifications are necessary to implement the proposed EPU. The following is a list of these modifications and the licensee's proposed schedule for completing them.

[Provide a list of plant modifications.]

The NRC staff's evaluation of the licensee's proposed plant modifications is provided in Section 2.0 of this safety evaluation.

1.5 Method of NRC Staff Review

The NRC staff reviewed the licensee's application to ensure that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) activities proposed will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public. The purpose of the NRC staff's review is to evaluate the licensee's assessment of the impact of the proposed EPU on design-basis analyses. The NRC staff evaluated the licensee's application and

Insert the following sentence if the licensee has not made any regulatory commitments in support of the EPU.

The licensee has made no regulatory commitments in its application for the EPU.

Insert the following if the licensee has made regulatory commitments in support of the EPU.

The licensee has made the following regulatory commitment(s):

[Provide a summary of each regulatory commitment made by the licensee.]

The NRC staff finds that reasonable controls for the implementation and for subsequent evaluation of proposed changes pertaining to the above regulatory commitment(s) are best provided by the licensee's administrative processes, including its commitment management program. The above regulatory commitments do not warrant the creation of regulatory requirements (items requiring prior NRC approval of subsequent changes).

5.0 RECOMMENDED AREAS FOR INSPECTION

As described above, the NRC staff has conducted an extensive review of the licensee's plans and analyses related to the proposed EPU and concluded that they are acceptable. The NRC staff's review has identified the following areas for consideration by the NRC inspection staff during the licensee's implementation of the proposed EPU. These areas are recommended based on past experience with EPUs, the extent and unique nature of modifications necessary to implement the proposed EPU, and new conditions of operation necessary for the proposed EPU. They do not constitute inspection requirements, but are intended to give inspectors insight into important bases for approving the EPU.

[Provide list of recommended areas for inspection.]

6.0 STATE CONSULTATION

In accordance with the Commission's regulations, the **[Name of State]** State official was notified of the proposed issuance of the amendment. The State official had **[no]** comments. **[If comments were received, address them here.]**

7.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, 51.33, and 51.35, a draft Environmental Assessment and finding of no significant impact was prepared and published in the *Federal Register* on **[Date]** (**FR**). The draft Environmental Assessment provided a 30-day opportunity for public comment. *If no comments were received, use the following sentence: [No comments were received on the draft Environmental Assessment.] If comments were received, use the following sentence: [The NRC staff received comments which were addressed in the final environmental assessment.]* The final Environmental Assessment was published in the *Federal Register* on **[Date]** (**FR**). Accordingly, based upon the environmental assessment, the Commission has determined that the issuance of this amendment will not have a significant effect on the quality of the human environment.

2.12 Power Ascension and Testing Plan

2.12.1 Approach to EPU Power Level and Test Plan

Regulatory Evaluation

The purpose of the EPU test program is to demonstrate that SSCs will perform satisfactorily in service at the proposed EPU power level. The test program also provides additional assurance that the plant will continue to operate in accordance with design criteria at EPU conditions. The NRC staff's review included an evaluation of: (1) plans for the initial approach to the proposed maximum licensed thermal power level, including verification of adequate plant performance, (2) transient testing necessary to demonstrate that plant equipment will perform satisfactorily at the proposed increased maximum licensed thermal power level, and (3) the test program's conformance with applicable regulations. The NRC's acceptance criteria for the proposed EPU test program are based on 10 CFR Part 50, Appendix B, Criterion XI, which requires establishment of a test program to demonstrate that SSCs will perform satisfactorily in service. Specific review criteria are contained in SRP Section 14.2.1.

Technical Evaluation

[Insert technical evaluation. The technical evaluation should (1) clearly explain why the proposed changes satisfy each of the requirements in the regulatory evaluation and (2) provide a clear link to the conclusions reached by the NRC staff, as documented in the conclusion section.]

Conclusion

The staff has reviewed the EPU test program, including plans for the initial approach to the proposed maximum licensed thermal power level, transient testing necessary to demonstrate that plant equipment will perform satisfactorily at the proposed increased maximum licensed thermal power level, and the test program's conformance with applicable regulations. The staff concludes that the proposed EPU test program provides adequate assurance that the plant will operate in accordance with design criteria and that SSCs affected by the proposed EPU, or modified to support the proposed EPU, will perform satisfactorily in service. Further, the staff finds that there is reasonable assurance that the EPU testing program satisfies the requirements of 10 CFR Part 50, Appendix B, Criterion XI. Therefore, the NRC staff finds the proposed EPU test program acceptable.

At the conclusion of these discussions, the meeting was opened for public comments. No public comments were received.

Please direct any inquiries to me at 301-415-2481, or ed.miller@nrc.gov.

/ra/

G. Edward Miller, Project Manager
Plant Licensing Branch I-2
Division of Operating reactor Licensing
Office of Nuclear Reactor Regulation

Enclosures:

- 1. List of Attendees
- 2. Presentation Slides
- 3. NEI Comments

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