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SCE&G®
A SCANA COMPANY

January 27, 2015
NND-15-0028
10 CFR 52.98(c)
10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Virgil C. Summer Nuclear Station (VCSNS) Units 2 & 3
Combined License Nos. NPF-93 and NPF-94
Docket Nos. 52-027 & 52-028

Subject: VCSNS Units 2 & 3 LAR 14-19: Request for License Amendment: HFE OSA Task Update and Removal of WCAP-15847

References: 1. ND-14-1765 Southern Nuclear Operating Company Vogtle Electric Generating Plant Units 3 and 4 Request for License Amendment: HFE OSA Task Update and Removal of WCAP-15847 (LAR-14-011)

In accordance with the provisions of 10 CFR 50.90, South Carolina Electric & Gas Company (SCE&G), the licensee for VCSNS Units 2 and 3, hereby requests an amendment to the combined licenses (COLs) for VCSNS Units 2 and 3, COL Numbers NPF-93 and NPF-94, respectively.

The requested amendment requires changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the Tier 2* information. Tier 2* document WCAP-15847 identifies documents that were used to support the AP1000 Design Certification. These documents have either been superseded or discontinued. Therefore, an amendment is being proposed to implement the necessary Tier 2* changes to delete WCAP-15847 from the UFSAR. In addition to this change, a Human Factors Engineering (HFE) Operational Sequence Analysis (OSA) task related to the Automatic Depressurization System (ADS) needs to be clarified. Both changes are associated with future HFE tasks and require changes to Tier 2* information.

The description, technical evaluation, regulatory evaluation (including the Significant Hazards Consideration determination), and environmental considerations for the proposed changes in the LAR are contained in Enclosure 1 to this letter. The proposed markups depicting the requested changes to the plant-specific licensing basis documents are contained in Enclosure 2.

This license amendment request is identical in technical content to that of Reference 1 with the exception of some additional text in the markup of UFSAR Section 18.2.3.5, Human Factors Engineering in Subcontractor Efforts, page 3 of Enclosure 2.

SCE&G requests staff approval of this license amendment request by February 5, 2016 to support completion of the HFE OSA task update. Delayed approval of this license amendment could result in a delay of this activity and subsequent dependent activities.

SCE&G expects to implement the proposed amendment through incorporation into the licensing basis within 30 days of approval of the requested changes.

In accordance with 10 CFR 50.91, SCE&G is notifying the State of South Carolina of this LAR by transmitting a copy of this letter to the designated state official.

Should you have any questions about this letter, please contact Justin R. Bouknight, Supervisor, Nuclear Licensing, by telephone at (803) 941-9828, or by email at justin.bouknight@scana.com.

This letter contains no regulatory commitments.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 27th day of January, 2015.

Sincerely,

April R. Rice
Manager, Nuclear Licensing
New Nuclear Deployment

DK/RAJ/dk

Enclosure 1: License Amendment Request Regarding HFE OSA Task Update and Removal of WCAP-15847 (LAR-14-19)

Enclosure 2: LAR 14-19: Proposed Changes to Licensing Basis Documents

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South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station Units 2 & 3

NND-15-0028

Enclosure 1

License Amendment Request:

HFE OSA Task Update and Removal Of WCAP-15847

(LAR 14-19)

(Enclosure 1 contains 12 pages, including this cover sheet)

Table of Contents

Pursuant to 10 CFR 50.90, South Carolina Electric & Gas Company (SCE&G) hereby requests an amendment to Combined License (COL) Nos. NPF-93 and NPF-94 for Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3, respectively.

1. Summary Description

The proposed activity would revise the Combined Licenses (COLs) by permitting a deletion of WCAP-15847 from the Tier 2* portion of the Updated Final Safety Analysis Report (UFSAR) and modifying an Operational Sequence Analysis (OSA) task.

1. WCAP-15847, "AP1000 Quality Assurance Procedures Supporting NRC Review of AP1000 DCD Sections 18.2 and 18.8," is a Tier 2*, Incorporated by Reference (IBR) document referenced in the UFSAR. The information provided in WCAP-15847 is obsolete, and has been superseded by other Westinghouse procedures. Therefore, a change is proposed to remove Tier 2* WCAP-15847 from the UFSAR.

2. The UFSAR lists a set of tasks to be analyzed during the OSA. One of the tasks is described as "ADS valve testing during Mode 1." However, Automatic Depressurization System (ADS) valve testing will occur during Mode 5, not Mode 1. Therefore, a change is proposed to describe this task as "ADS valve testing during Mode 5."

The requested amendment requires changes to Tier 2* information in the UFSAR. This enclosure requests approval of the license amendment necessary to implement these changes.

2. Detailed Description and Technical Evaluation

WCAP-15847, "AP1000 Quality Assurance Procedures Supporting NRC Review of AP1000 DCD Sections 18.2 and 18.8," is a Tier 2*, Incorporated by Reference (IBR) document referenced in the UFSAR. WCAP-15847 was provided to facilitate the NRC review of AP1000 program operating procedures to support the AP1000 Design Certification. As stated in the WCAP introduction, the current versions of the pertinent procedures at that time were compiled into this WCAP for transmittal to the NRC as examples of design procedures applicable to the AP1000. The procedures, which were issued between 1991 and 2002, no longer exist, are not currently used, or have been superseded by other Westinghouse procedures. This proposed activity will delete WCAP-15847 as a reference in the UFSAR.

WCAP-15847, Revision 1, comprises ten appendices, eight of which are Westinghouse policies and procedures. WCAP-15847 states that these are "examples of design procedures applicable to the AP1000." Removal of this WCAP as an IBR document will subject these procedures to the applicable change control requirements in 10 CFR 50.54(a), §50.55(f), §50.59, and 10 CFR 52 Appendix D, Section VIII. These change control requirements along with the UFSAR Quality Assurance requirements will maintain compliance with the applicable Design and Document Control requirements in 10 CFR Part 50 Appendix B. Adherence to these requirements through Westinghouse's Appendix B Quality Assurance Program will maintain compliance with respect to the design basis as future changes to the Licensee's AP1000 plant are processed.

The content of the procedures compiled in WCAP-15847 are currently addressed by the requirements in UFSAR Chapter 17, Section 17.3. Section 17.3 identifies Quality Assurance requirements as they relate to design, procurement, fabrication, inspection, and testing and includes a description of how the AP1000 project complies with American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA)-1. Per UFSAR Section 17.3, Westinghouse's Quality Management System (QMS) procedure was developed in accordance with NQA-1. In turn, Westinghouse Level 2 and Level 3 procedures are developed in accordance with the Westinghouse QMS. Because the content of the procedures compiled in WCAP-15847 are adequately addressed in UFSAR Section 17.3, this activity does not remove any commitments from the licensing basis.

The text below describes the ten WCAP-15847 appendices and either maps the appendix to a current applicable Westinghouse procedure or describes why the appendix is obsolete. This exercise confirms that the QA requirements from UFSAR Chapter 17, Section 17.3 are addressed by the current Westinghouse Level 2 and Level 3 procedures.

1. "AP1000 Program Operating Procedure Table of Contents"
   The "AP1000 Program Operating Procedure Table of Contents" contains a list of procedures used in the AP1000 design program. Many of the procedures in the list have been updated or superseded, and many new procedures have been added. Westinghouse maintains a list of their policies and procedures that is more comprehensive and current. This list identifies each procedure applicable to its respective organization, and accomplishes the same objective as the previous document in a similar manner. This list is not maintained as a controlled procedure, but the procedures utilized for the AP1000 Design Program are retained in the Westinghouse records management system. In addition, the individual documents are reviewed, issued, and controlled in accordance with the QMS and NQA-1.

2. "AP1000 Program Procedure Matrix"
   A listing of Westinghouse policies and procedures is contained in an internal Westinghouse "Policies and Procedures" document. The purpose of the Westinghouse policies and procedures document is to establish and describe the responsibilities and requirements for revising, issuing, and maintaining the QMS, which was developed in accordance with NQA-1. The procedures directly establish responsibilities and requirements consistent with the QMS. As stated in the introduction of the Program Procedure Matrix, the purpose of the matrix is to show the relationship between policies and implementing procedures. Similar to Item 1 above, the current list of Westinghouse policies and procedures is more comprehensive and current, while still maintaining the Program Procedure's Matrix categorization into functional areas.

3. AP-3.1 "AP600 System Specification Documents"
   AP-3.1 is a high-level document with relatively little detail. The purpose of this document was to establish the responsibilities and requirements for preparing system specification documents (SSDs) for the AP600 plant. A comparison of the content in AP-3.1 to Westinghouse's current design specifications document was performed. The current document specifies the applicable engineering organizations responsible for performing design activities in accordance with established requirements. This procedure also states the responsibilities for preparing, reviewing, and approving design specifications,

drawings, and other design documentation. In addition, it defines the requirements for procurement, manufacturing, installation, servicing, quality, and other activities.

AP-3.1 was also compared against the current Westinghouse procedure for AP1000 system specification documents. Both documents require the development of an SSD for each AP1000 system and specify the required SSD format and content. Like AP-3.1, the current Westinghouse procedure for AP1000 system specifications gives details on how to prepare, revise, and issue an SSD. Therefore, the requirements for the development of SSDs are adequately addressed by the current procedures in use on the AP1000 project.

4. AP-3.2 “Change Control for the AP600 Program”
   AP-3.2 defined the process and actions required to propose and implement a change to the design previously released in a document for project use and placed under configuration control.

   A comparison of AP-3.2 against the current Westinghouse AP1000 change control program procedure for change control for the AP1000 Plant Program was performed. As discussed in its purpose statement, the Westinghouse AP1000 change control program defines the process required to propose, evaluate, approve, and implement changes to the AP1000 design as reflected in design or licensing basis documents that have been placed under configuration control and released for use. The Westinghouse AP1000 change control program procedure includes design documents placed under configuration control for the first time when such documents impact other documents already under configuration control. Both change control program procedures describe the steps involved in making a design change and utilize many of the same terms and methods. Due to the procedures achieving the same purpose and the most current version complying with NQA-1 through the QMS, the goals of AP-3.2 are addressed in this new procedure and consequently, the scope of AP-3.2 has been maintained.

5. AP-3.5 “Design Review”
   Procedure AP-3.5 described the method for preparing, conducting, and documenting formal design reviews for the purpose of design verification. This procedure could also be used as a guide for non-verification design reviews.

   A comparison of AP-3.5 against the current Westinghouse design review procedure was performed. The current procedure establishes the responsibilities and requirements for implementing an independent design review, which can also be part of the design verification process. In addition, this procedure can also be used as a guide for other review activities. This procedure contains more detail than AP-3.5 with respect to steps, roles and responsibilities, and provides revised design review checklists but still achieves the same overall purpose. Therefore, it is concluded that the scope of AP-3.5 has been maintained within this procedure.

6. AP-3.6 “AP600 Design Criteria Documents”
   AP-3.6 defined the responsibilities and requirements for the preparation, review, approval, and revision of design criteria documents for the AP600 project. The requirements of this procedure have been distributed and maintained through the development of three internal Westinghouse procedures:

- The current Westinghouse functional specifications procedure contains the instructions necessary for the preparation and use of documents that record the specification of functions or functional requirements.
- The current Westinghouse design specifications procedure establishes the responsibilities and requirements for the preparation, review, and control of design specifications.
- The current Westinghouse design criteria documents procedure establishes the requirements, and gives procedural steps, for the preparation and revision of design criteria documents for the AP1000.

A comparison of AP-3.6 against the contents of these documents demonstrated that they accomplish the same purpose, using many of the same general procedural steps and, therefore, the documents are aligned and the contents of AP-3.6 are currently addressed by the newer procedures.

7. AP-3.7 “Interface Control Document”
   Procedure AP-3.7 established the requirements and responsibilities for developing, approving, implementing, revising, and maintaining the Interface Control Documents (ICDs) related to the AP600 Program.

   A comparison of AP-3.7 against the current Westinghouse design specifications procedure was performed. The current design specifications procedure specifies the process for performing design activities in accordance with established requirements, and for preparing, reviewing, and approving design specifications, drawings, and other design documentation. This procedure also contains a subsection on the inclusion of interface requirements within design specifications which aligns with AP-3.7. Therefore, it is concluded that interface control is currently maintained by the current Westinghouse procedure.

8. AP-3.12 “Engineering Database Access”
   Procedure AP-3.12 provided the requirements and responsibilities for preparing and approving the movement of data into the AP600 Engineering Database. The requirements of this procedure have been distributed and maintained in two Westinghouse Policies and Procedures:

   - The configuration management and change control procedures for the AP1000 SmartPlant Foundation (SPF) database defines the responsibilities and requirements for configuration management and control of the AP1000 Engineering Database content, including schema, Graphics User Interface (GUI), SmartPlant Foundation, and the Oracle database.
   - The procedure for the use of the Configuration Information Management (CIMS) SmartPlant Foundation (SPF) security application is currently used for the development, testing, and production of the SmartPlant Foundation database. This procedure defines the responsibilities and requirements for configuration control process for SmartPlant Foundation development, and the test and production environment. This procedure requires all changes to occur within an identifiable and controlled environment.

Since the original issuance of AP-3.12, significant changes have occurred with respect to the maintenance and control of electronic information. While AP-3.12 contains significantly less information than these two procedures, the ultimate purpose of the procedures remains the same; i.e., to establish the requirements and responsibilities associated with the electronic configuration control of plant information. A comparison of AP-3.12 against these procedures demonstrated that they maintained alignment with the content in AP-3.12.

9. AP-3.14 "Plant Instrumentation & Control System"
   Procedure AP-3.14 provided specific requirements as well as guidelines for work conducted by the Plant Instrumentation and Control System (PI&CS) Group.

   No current Westinghouse policies and procedures are directly comparable to AP-3.14. This procedure was discontinued in 2007. In 1991, AP-3.14 was created for the PI&CS Group. The PI&CS Group was dissolved into other functional areas and the purpose of AP-3.14 was no longer applicable. This procedure needs to be removed from the licensing basis, because the group for which the procedure was created is no longer in existence. The previous roles and responsibilities for this group that needed to be maintained have been transposed into applicable working group procedures.

10. AP-7.2 "Control of Subcontractor Submittals"
    Procedure AP-7.2 established the methodology for the receipt, distribution, control and review of subcontractor design document submittals.

    A comparison of AP-7.2 against the current Westinghouse document for control of supplier generated documents was performed. The current Westinghouse controls document establishes the responsibilities and requirements for the handling and disposition of documents submitted between suppliers and Westinghouse under a Westinghouse Purchase Order. The current Westinghouse inter-business unit edition policies & procedures document is the current procedure in use, consolidating AP-7.2 and another procedure. Therefore, it is concluded that the requirements of AP-7.2 have been maintained in the current Westinghouse document.

Correction of OSA Task

The OSA task "ADS valve testing during Mode 1" is proposed to be changed to identify Mode 5 as the appropriate mode for performance of this task. In accordance with 10 CFR 50.2 and ANS/ANSI 51.1, both ADS valves in each line are normally closed during normal reactor operation. If one of these valves is opened (for example, for testing), the RCS pressure boundary is not fully maintained in accordance with this criteria. Table 3.9-16 of the UFSAR describes the Valve Inservice Test Requirements. Note 3 of this table applies to the ADS stage 1/2/3 valves (RCS-V001A/B, RCS-V002 A/B, RCS-V003 A/B, RCS-V0011 A/B, RCS-V0012 A/B, and RCS-V0013 A/B). This note requires that these valves be closed to maintain the RCS pressure boundary and that they are tested during cold shutdowns (i.e., Mode 5) when the RCS pressure is reduced to atmospheric pressure. This avoids a loss of coolant accident caused by mispositioning a single valve during IST. Technical Specification Surveillance Requirement (SR) 3.4.11.2 requires verification that each ADS stage 1, 2, and 3 valve strokes to its fully opened position during shutdown conditions (i.e., Mode 5).

The proposed changes to update the HFE OSA task and remove WCAP-15847 are unrelated to any aspect of plant construction or operation that would introduce any change to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents), or affect any plant radiological or non-radiological effluent release quantities. Furthermore, the proposed changes do not affect any effluent release path or diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation.

The proposed changes to update the HFE OSA task and remove WCAP-15847 do not affect any plant radiation zones (addressed in UFSAR Section 12.3), nor do they affect controls established under 10 CFR 20 to preclude a significant increase in occupational radiation exposure.

Licensing Basis Changes:

Proposed UFSAR Changes Related to Deleting WCAP-15847:

1. Table 1.6-1, Material Referenced

   This table is revised to remove WCAP-15847, "AP1000 Quality Assurance Procedures Supporting NRC Review of AP1000 DCD Sections 18.2 and 18.8," as a DCD Section 18.2 reference.

2. UFSAR Chapter 18, Section 18.2.3.5, Human Factors Engineering in Subcontractor Efforts

   The section is revised to delete the sentences that reference the AP1000 Program Procedure Matrix in WCAP-15847.

3. UFSAR Chapter 18, Section 18.2.7, References

   This section is revised to delete Reference 6 and indicate that it is no longer applicable.

Proposed UFSAR Change Related to OSA Task Analysis:

1. UFSAR Chapter 18, Section 18.5.1, Task Analysis Scope

   This section is revised to indicate that ADS valve testing will occur during Mode 5 and not during Mode 1.

3. Technical Evaluation (Incorporated into Section 2)

4. Regulatory Evaluation

4.1 Applicable Regulatory Requirements/Criteria

10 CFR Part 52, Appendix D, VIII.B.6.a requires prior NRC approval for departure from Tier 2* information. The proposed activity deletes WCAP-15847 and revises an OSA task. Both changes affect Tier 2* text in the UFSAR. Therefore, a license amendment request (LAR) is required.

4.2 Precedent

No precedent is identified. However, future submittals for this same change may cite previously approved License Amendment Requests as precedence.

4.3 Significant Hazards Consideration Determination

The proposed changes would revise the Combined Licenses (COLs) by removing the Tier 2*, Incorporated by Reference document WCAP-15847, "AP1000 Quality Assurance Procedures Supporting NRC Review of AP1000 DCD Sections 18.2 and 18.8" from the UFSAR. This license amendment request also proposes a change to amend UFSAR Tier 2* text by correcting the operating mode during which the Operational Sequence Analysis task associated with ADS valve testing is performed.

An evaluation to determine whether or not a significant hazards consideration is involved with the proposed amendment was completed by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

4.3.1 Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed deletion of WCAP-15847 removes obsolete and superseded procedures from the licensing basis. The amendment of the operational sequence analysis (OSA) task alters the automatic depressurization system (ADS) testing from Mode 1 to Mode 5. The proposed changes to the procedures do not involve any accident initiating component/system failure or event, and the change to the ADS testing mode helps prevent accidents would occur if the tests were performed in Mode 1. Thus, the probabilities of the accidents previously evaluated are not affected. The affected procedures and requirements do not adversely affect or interact with safety-related equipment or a radioactive material barrier, and this activity does not involve the containment of radioactive material. Thus, the proposed changes would not affect any safety-related accident mitigating function. The radioactive material source terms and release paths used in the safety analyses are unchanged, thus the radiological releases in the Updated Final Safety Analysis Report accident analyses are not affected.

Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

4.3.2 Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

Removing WCAP-15847 from the UFSAR and amending the OSA task regarding ADS valve testing does not adversely affect the design or operation of safety-related equipment or equipment whose failure could initiate an accident other than what is already described in the licensing basis. These changes do not adversely affect safety-related equipment or fission product barriers. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the requested change.

Therefore, the changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

4.3.3 Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

The proposed changes to remove WCAP-15847 from the UFSAR and amend the OSA task do not adversely affect any safety-related equipment, design code compliance, design function, design analysis, safety analysis input or result, or design/safety margin because NQA-1 requirements are maintained in other Westinghouse procedures and testing of the ADS valves is still performed. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the proposed changes, thus no margin of safety is reduced.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Pursuant to 10 CFR 50.92, the requested change does not involve a Significant Hazards Consideration.

5. Environmental Considerations

This proposed activity deletes WCAP-15847 from the UFSAR and corrects the OSA task, as described above. Deleting the document and correcting the OSA task does not affect plant design, any physical aspect of the plant, system function, design function, or any equipment qualification previously performed.

The proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), in that:

(i) There is no significant hazards consideration.

As documented in Section 4.3, Significant Hazards Consideration Determination, of this license amendment request, an evaluation was completed to determine whether or not a significant hazards consideration is involved by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment." The Significant Hazards Consideration determined that (1) the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) the proposed amendment does not involve a significant reduction in a margin of safety. Therefore, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

(ii) There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

The proposed changes in the requested amendment are to remove an obsolete and superseded WCAP and amend an OSA task to reference the proper mode. The proposed changes are unrelated to any aspect of plant construction or operation that would introduce any change to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents), or affect any plant radiological or non-radiological effluent release quantities. Furthermore, the proposed changes do not affect any effluent release path or diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation. Therefore, it is concluded that the proposed amendment does not involve a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed changes in the requested amendment are to remove an obsolete and superseded WCAP and amend an OSA task to reference the proper mode. Plant radiation zones (addressed in UFSAR Section 12.3) are not affected, and controls under 10 CFR 20 preclude a significant increase in occupational radiation exposure. Therefore, the proposed amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above review of the proposed amendment, it has been determined that anticipated construction and operational effects of the proposed amendment do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the

proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment of the proposed amendment is not required.

6. References

None

South Carolina Electric & Gas Company

Virgil C. Summer Nuclear Station Units 2 & 3

NND-15-0028

Enclosure 2

Proposed Changes to

Licensing Basis Documents

(LAR 14-19)

Note: Added text is **Blue Underline**
Deleted text is ~~**Red Strikethrough**~~

(Enclosure 2 consists of 5 pages, including this cover page)

UFSAR SECTION 1.6, TABLE 1.6-1:

Table 1.6-1 (Sheet 19 of 21)

Material Referenced

DCD Section Number	Westinghouse Topical Report Number	Title
. . .	. . .	. . .
18.2	. . .	. . .
	~~[*WCAP-15847*~~	~~*AP1000 Quality Assurance Procedures Supporting NRC Review of AP1000 DCD Sections 18.2 and 18.8, Rev. 1, December 2002*]*~~
	. . .	. . .

UFSAR Chapter 18, Section 18.2.3.5, Human Factors Engineering in Subcontractor Efforts:

18.2.3.5 Human Factors Engineering in Subcontractor Efforts

Human factors engineering and human system interface requirements are passed on to subcontractors through engineering documents including design criteria and system specification documents.

Activities within subcontractor design organizations are performed in accordance with the written procedures of those organizations **and any applicable Westinghouse policies and procedures**. [~~*The AP1000 Program Procedure Matrix in WCAP-15847 (Reference 6) identifies the procedures that apply to subcontractor design organizations. The procedures of WCAP-15847 that describe the design documentation, apply to these external organizations with respect to content and format requirements.*~~ *Effective implementation of each organization's quality assurance program is monitored by their respective internal audit programs, and by supplier audits.*]* See Section 17.3 for quality assurance requirements associated with subcontractor human factors engineering design efforts.

UFSAR Chapter 18, Section 18.2.7, References:

18.2.7 References

[1. *NUREG-0711, "Human Factors Engineering Program Review Model," U.S. NRC, July 1994.*]*

2. WCAP-14645, "Human Factors Engineering Operating Experience Review Report For The AP1000 Nuclear Power Plant," Revision 3.

3. WCAP-14694, "Designers Input to Determination of the AP600 Main Control Room Staffing Level," Revision 0, July 1996.

4. WCAP-14644, "AP600/AP1000 Functional Requirements Analysis and Allocation," Revision 1.

5. Reason, J. T., "Human Error," Cambridge, U.K., Cambridge University Press, 1990.

[6. ~~*WCAP-15847, "AP1000 Quality Assurance Procedures Supporting NRC Review of AP1000 DCD Sections 18.2 and 18.8," Revision 1, December 2002.*~~]~~*~~**Not used.**

[7. *NUREG-0711, Rev. 1, "Human Factors Engineering Program Review Model," U.S. NRC, May 2002.*]*

8. APP-OCS-GBH-001, "AP1000 Human Factors Engineering Program Plan," Westinghouse Electric Company LLC.

9. APP-GW-GLR-136, "AP1000 Human Factors Program Implementation for the Emergency Operations Facility and Technical Support Center," Westinghouse Electric Company LLC.

UFSAR Chapter 18, Section 18.5.1, Task Analysis Scope:

18.5.1 Task Analysis Scope

[*The scope of the AP1000 task analysis is divided into two complementary activities: function-based task analysis (FBTA) and traditional task analysis, or operational sequence analysis (OSA). The scope of the function-based task analysis is the Level 4 functions*]* identified in Figure 18.5-1. This figure is the functional decomposition (goal-means analysis) for normal power operations in a standard pressurized water reactor. Examples of functions at Level 4 are "Control RCS Coolant Pressure" and "Control Containment Pressure." This set of functions defines the breadth of functions to be analyzed. The function-based task analysis will be expanded in scope to include any additional Level 4 functions identified.

[*The traditional task analysis, or operational sequence analysis, is developed for a representative set of operational and maintenance tasks. The following guidelines are applied to select tasks:*

- *Tasks are selected to represent the full range of operating modes, including startup, normal operations, abnormal and emergency operations, transient conditions, and low-power and shutdown conditions.*

- *Tasks are selected that involve operator actions that are identified as either critical human actions or risk-important tasks, based on the criteria in Reference 13.*

- *Tasks are selected to represent the full range of activities in the AP1000 emergency response guidelines.*

- *Tasks are selected that involve maintenance, test, inspection, and surveillance (MTIS) actions. A representative set of maintenance, test, inspection, and surveillance tasks are analyzed for a subset of the "risk-significant" systems/structures/components (SSCs).*

The set of tasks to be analyzed are not identified as a part of design certification. The OSAs listed below are included in the set of tasks to be analyzed: (Each of these satisfies one or more of the selection criteria described above.)

- *Plant heatup and startup from post-refueling to 100% power*
- *Reactor trip, turbine trip, and safety injection*
- *Natural circulation cooldown (startup feedwater with steam generator)*
- *Loss of reactor or secondary coolant*
- *Post loss-of-coolant accident cooldown and depressurization*
- *Loss of RCS inventory during shutdown*
- *Loss of the normal residual heat removal system (RNS) during shutdown*
- *Manual automatic depressurization system (ADS) actuation*
- *Manual reactor trip via PMS, via diverse actuation system (DAS)*
- *ADS valve testing during Mode ~~1~~ 5*