

## 13. CONDUCT OF OPERATIONS

### 13.3 Emergency Planning

#### 13.3.1 Summary of Technical Information

In Revision 17 to the AP1000 design control document (DCD), Westinghouse Electric Company, LLC (Westinghouse) proposed changes to the designation of the Technical Support Center (TSC) location from the Main TSC Operations Area, to the Control Support Area (CSA). Additional, related DCD changes included (1) removing the TSC annex building location designation in Table 3.1-1, "Inspections, Tests, Analyses, and Acceptance Criteria" (ITAAC), which eliminates the TSC location as Tier 1 design-related information in the DCD; (2) adding, as a Tier 2\* designation, that the TSC is located in the CSA; and (3) providing numerous additional conforming changes to the DCD, consistent with the new TSC/CSA designation. The technical justification for the proposed changes are provided in Westinghouse's June 14, 2007, Technical Report Number 107 (APP-GW-GLR-107, Revision 1), entitled "AP1000 Technical Support Center (TR107)."

#### 13.3.2 Evaluation

##### 13.3.2.1 Regulatory Basis

Pursuant to Title 10 of the Code of Federal Regulations (10 CFR) 52.48, "Standards for Review of Applications," the staff reviewed DCD Revision 16 and TR 107 for compliance with the standards set out in 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, as those standards are technically relevant to the proposed (Tier 1, Tier 2, and Tier 2\*) generic design modifications governing the TSC location. Consistent with Section VIII of Appendix D, "Design Certification Rule for the AP1000 Design," to 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," 10 CFR 52.63(a)(1) governs generic changes to Tier 1 and Tier 2 information. This regulation states, in part, that the Commission may not modify certification information requirements – in response to a petition from any person – unless the Commission determines in a rulemaking that the change meets at least one of the criteria in 10 CFR 52.63(a)(1)(i) through (vii). The applicable criterion associated with the changes proposed in TR 107 is 10 CFR 52.63(a)(1)(iii), which states that the change "[r]educes unnecessary regulatory burden and maintains protection to public health and safety and the common defense and security." In addition, 10 CFR 52.63(a)(3) states that – subject to various exceptions – such modifications will be applied to all plants referencing the certified design.

In its review of the proposed changes to the AP1000 DCD, the staff considered the regulatory requirements of 10 CFR 50.47, "Emergency Plans," and Appendix E to 10 CFR Part 50, to the extent they address the TSC location. Specifically, the staff reviewed the proposed modifications to the AP1000 standard design against the applicable regulatory requirements in 10 CFR 50.47(b)(8) and Sections III and IV.E of Appendix E to 10 CFR Part 50. These regulations require the licensee to provide and maintain adequate emergency facilities and equipment to support the emergency response, including an onsite TSC from which it can effectively give direction and exercise control during an emergency.

Compliance with these regulations is determined by using the guidance in Regulatory Guide (RG) 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," Revision 4, issued July 2003, which endorses Revision 1 of NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, issued November 1980 (supplemented by the March 2002 addenda), and through it, NUREG-0696, "Functional Criteria for Emergency Response Facilities—Final Report," issued February 1981, and Supplement 1 to NUREG-0737, "Clarification of TMI Action Plan Requirements—Requirements for Emergency Response Capability," issued January 1983. The staff also used Section 13.3, "Emergency Planning," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants" (hereafter referred to as the SRP), Revision 3, issued March 2007.

#### 13.3.2.2 Technical Evaluation—TSC Location

In the AP1000 certified design, the applicant identified the TSC as the Main TSC Operations Area (Room 40403) in the annex building at Elevation 117'-6", adjacent to the passage from the annex building to the nuclear island control room. The TSC provides an area and resources for use by personnel providing plant management and technical support to the plant operating staff during emergency evolutions. The TSC relieves operators of peripheral duties and communications not directly related to reactor system manipulations and prevents congestion in the control room.

The proposed changes in DCD Revision 17, as discussed in TR-107, would allow an applicant (for a construction permit (CP), operating license (OL), or combined license (COL)) that references the AP1000 certified design (i.e., Appendix D of 10 CFR Part 52) to use either the CSA (Room 40403) as the TSC, or designate an alternative TSC location, pursuant to the change process in Sections VIII.B.5 and VIII.B.6 to Appendix D of 10 CFR Part 52. The intended purpose of the proposed changes is to provide flexibility to those applicants that reference the AP1000 certified design, so that they could locate the TSC in either the CSA or at another location. For example, a COL application for multiple units or at an existing reactor site could propose a single, common TSC that would be located in a central area on the site and would support all reactor units.

In reviewing this proposed DCD change, the staff considered the guidance in Planning Standard H, "Emergency Facilities and Equipment," of NUREG-0654/FEMA-REP-1, which states, in Evaluation Criterion H.1, that "the TSC shall be established in accordance with NUREG-0696." Section 2.2, "Location," of NUREG-0696 states the following:

The onsite TSC is to provide facilities near the control room for detailed analyses of plant conditions during abnormal conditions or emergencies by trained and competent technical staff. During recent events at nuclear power plants, telephone communications between the facilities were ineffective in providing all of the necessary management interaction and technical information exchange. This demonstrates the need for face-to-face communications between TSC and control room personnel. To accomplish this, the TSC shall be as close as possible to the control room, preferably located within the same building. The walking time from the TSC to the control room shall not exceed 2 minutes. This close location will facilitate face-to-face interaction between control room personnel and the senior plant manager working in the TSC. This proximity also will provide access to information in the control room that is not available in the TSC data system.

Provisions shall be made for the safe and timely movement of personnel between the TSC and the control room under emergency conditions. These provisions shall include consideration of the effects of direct radiation and airborne radioactivity from inplant sources on personnel traveling between the two facilities. Anticontamination clothing, respiratory protection, and other protective gear may be used to help protect personnel in transit. The 2-minute travel time between the TSC and the control room does not include time required to put on any necessary radiological protective gear, but it does include the time required to clear any security checkpoints. There should be no major security barriers between these two facilities other than access control stations for the TSC and control room.

In addition, Section 8.2.1.b of Supplement 1 to NUREG-0737 states that the TSC will be located within the site's protected area so as to facilitate necessary interaction with personnel in the control room, operational support center (OSC), emergency operations facility (EOF), and with other personnel involved in the emergency.

The staff had previously considered the "2-minute walking time" criterion associated with the TSC location (identified above in NUREG-0696), as part of the development of the emergency planning ITAAC addressed in SECY-05-0197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria," dated October 25, 2005. In relation to the TSC location, ITAAC Acceptance Criterion 5.1.2 of SECY-05-0197 includes the statement that "[t]he COL applicant will adopt design certification criteria, if applicable, or otherwise specify TSC location." The equivalent ITAAC Acceptance Criterion 8.1.2 of the SRP (Table 14.3.10-1) and RG 1.206, "Combined License Applications for Nuclear Power Plants" (Table C.II.1-B1), added a statement that "[a]dvanced communication capabilities may be used to satisfy the two minute travel time."

The staff evaluated various factors in determining the appropriateness and acceptability of providing flexibility relating to the 2-minute walking time between the TSC and the control room in NUREG-0696, including the advances in communication technologies since the U.S. Nuclear Regulatory Commission (NRC) issued NUREG-0696 in 1981. In addition, having a common TSC that supports multiple reactor units and is located a moderate distance (i.e., more than 2 minutes) from the control rooms presents distinct advantages. These advantages include the increased efficiency of a centralized point of support for the entire site, including a single point of contact for offsite support, the elimination of confusion regarding which TSC on a multiple-unit site would be staffed during an emergency, the elimination of duplicate systems and equipment, not having to staff multiple TSCs if an incident involved more than one unit, and consideration of security-related events. From a support and functional standpoint, the staff finds that the applicant's proposed changes in DCD Revision 17, as discussed in TR 107, associated with the TSC location for the AP1000 standard design are acceptable, in that they would provide for the exchange of technical information and the requisite guidance and technical assistance to the control room during an emergency.

As reflected in AP1000 DCD Revision 17, Westinghouse requested (in TR 107) a change in the TSC location designation from Tier 1 to Tier 2\*. The staff's position is that the change should be to Tier 2, rather than Tier 2\*. (A change of Tier 1 to Tier 2 would be governed by the same regulatory basis, described above, as a change from Tier 1 to Tier 2\*.) This is because the NRC has previously used the Tier 2\* designation for DCD information, where there is a reasonable expectation of a change over the lifetime of the facility; e.g., a fuel change. The

nature of the information is such that the NRC must review and approve the proposed change prior to the change being made.. As another example, the Tier 2\* designation would be appropriate for information relating to detailed design methodologies and evaluation criteria. Such examples could result in design changes where the safety of the completed design may not be readily apparent. In regard to the AP1000 DCD, once the TSC is built, it is unlikely that it will be moved. Thus, the staff concludes that the Tier 2 designation for the TSC location is more appropriate than Tier 2\*. For a Tier 2 TSC DCD location designation, a proposed change to the TSC location (i.e., to a location other than the CSA) by an applicant (or licensee) would require a departure from the certified design.

The staff has determined that the applicant must change the TSC location designations in the DCD from Tier 2\* to Tier 2 (e.g., in DCD Section 18.8.8.3.5). The other DCD Tier 1 requirements associated with the TSC are unaffected by this change, and will be subject to the applicable Tier 1 change control process. The staff has identified resolution of this issue as Open Item [TR107-NSIR-07].

### **13.3.3 Conclusion**

As discussed above, Open Item [TR107-NSIR-07] needs to be resolved in order to meet the requirements of 10 CFR 52.63(a)(1). The NRC staff will update Section 13.3 of this SER to reflect the final disposition of the Open Item.

## **13.5 Plant Procedures**

### **13.5.1 Summary of Technical Information**

In Revision 17 to the AP1000 DCD, Westinghouse proposed to partially resolve COL Item 13.5-1 in TR-70, "Plant Operations, Surveillance, and Maintenance Procedures" (APP-GW-GLR-040), Revision 1 and in the DCD by addressing; normal operating, abnormal operating, emergency operating, refueling and outage planning, alarm response, administrative, maintenance, inspection, test, and surveillance procedures, as well as the procedures that address the operation of post-72-hour equipment. The COL applicant will still address operational and maintenance programmatic issues to resolve COL Item 13.5-1.

### **13.5.2 Evaluation**

SRP Section 13.5.2.1 states that the applicant should describe its program for developing the operating procedures and that the staff will review the applicant's program for developing and implementing the operating procedures. The staff reviewed TR-70, Revision 1, and its associated references, and determined that it described a process to manage the development, review, and approval of these procedures but did not clearly provide the requested description. The staff submitted RAI-SRP13-COLP-01 to ask that Westinghouse clarify the program description for developing and implementing the operating procedures. In a letter dated July 29, 2008, Westinghouse stated that TR-70, Revision 1, described the program. Subsequent to the submission of TR-70, Revision 0, the staff met with Westinghouse to discuss procedure development issues related to the AP1000 design and to allow the staff an opportunity to audit a variety of AP1000 operations procedures. TR-70, Revision 1, addresses issues discussed in this meeting, as well as the concerns regarding NUREG-0711, "Human Factors Engineering Program Review Model," issued February 2004, that were discussed and later addressed in the staff letter, "Summary of the April 11 and 12, 2007, Meeting to Discuss AP1000 Plant Operating Procedures," dated May 11, 2007. Along with TR-70, Revision 1,

Westinghouse submitted the AP1000 Writer's Guidelines for the Normal and Two-Column Format Procedures (APP-GW-GJP-100 and 200). After reviewing the AP1000 Writer's Guidelines, which clarified procedure development, the staff finds TR-70 Rev. 1 acceptable because the Westinghouse program description for developing and implementing the operating procedures meets the guidance in SRP Chapter 13.5.2.1.

Similarly, with respect to the development of emergency operating procedures (EOPs), SRP Section 13.5.2.1, states that the applicant should describe its program for developing EOPs, as well as the required content of the EOPs, and that the staff will review the applicant's program for developing and implementing the EOPs. The staff reviewed TR-70 and its associated references and determined that it described a process to manage the development, review, and approval of these procedures but did not clearly provide the requested description. The staff submitted RAI-SRP13-COLP-02 to ask Westinghouse to describe the program for developing and implementing the EOPs. In a letter dated July 29, 2008, Westinghouse stated that TR-70, Revision 1, described the program. Subsequent to the submission of TR-70, Revision 0, the staff met with Westinghouse to discuss procedure development issues related to the AP1000 design and to allow the staff an opportunity to audit a variety of the AP1000 operations procedures. TR-70, Revision 1, addresses issues discussed in this meeting, as well as the concerns regarding NUREG-0711 that were discussed and later addressed in the staff letter dated May 11, 2007 (ADAMS Accession No. ML071160237). Along with TR-70, Revision 1, Westinghouse submitted the AP1000 Writer's Guidelines for the Normal and Two-Column Format Procedures (APP-GW-GJP-100 and 200). After reviewing the AP1000 Writer's Guidelines, which clarified procedure development, the staff finds TR-70 Rev. 1 acceptable because the Westinghouse program description for developing and implementing the EOPs meets the guidance in SRP Chapter 13.5.2.1.

The staff reviewed DCD, Section 13.5.1, which references TR-70, Revision 1, and its associated references, which the applicant submitted as a basis for closing this COL action item. During this review, the staff noted that the DCD addressed safety-related logic circuitry but did not specify which organization had responsibility for it. The staff submitted RAI-SRP13-COLP-03 and RAI-SRP13-COLP-04 to ask Westinghouse to specify which organization had responsibility for safety-related logic circuitry and freeze seals respectively. In a letter dated July 29, 2008, Westinghouse stated that it had responsibility for these issues, as described in TR-70, Revision 1. The staff finds this acceptable because the Westinghouse program for developing and implementing the operating procedures includes a complete description of the safety-related logic circuitry and freeze seals and thus meets the guidance in SRP Chapter 13.5.2.1.

The staff reviewed DCD, Section 13.5.1, which states that TR-70 partially addresses the requested COL information, which includes normal operating, abnormal operating, emergency operating, refueling and outage planning, alarm response, administrative, maintenance, inspection, test, and surveillance procedures, as well as the procedures that address the operation of post-72-hour equipment, and that the COL applicant will address operational and maintenance issues. The staff was not clear as to which operational and maintenance issues the COL applicant is responsible for or how they differ from those addressed in TR-70. The staff submitted RAI-SRP13-COLP-05 to ask Westinghouse to clarify these issues. In a letter dated July 29, 2008, Westinghouse stated that it was responsible for the development, review and approval of normal operating, abnormal operating, emergency operating, refueling and outage planning, alarm response, administrative, maintenance, inspection, test, and surveillance procedures, as well as the procedures that address the operation of post-72-hour equipment, and that the COL applicant was responsible for maintaining those procedures after their approval and acceptance, as well as for operator training in those procedures. The staff

finds this acceptable because the responsibility for developing and implementing the operating procedures meets the guidance in SRP Chapter 13.5.2.1.

The staff reviewed DCD, Section 13.5.1, which states that TR-70 submitted several reports to the staff. To the staff, the word “submit” means “docketed,” so this is not an appropriate word to use when referring to documents that have not been docketed. The staff submitted RAI-SRP13-COLP-06 to inform the applicant of this meaning. In a letter dated July 29, 2008, Westinghouse acknowledged the incorrect language and provided corrected text with amended language. The staff finds this acceptable because the Westinghouse program description now uses language that is clear and consistent with the staff’s understanding.

### **13.5.3 Conclusion**

Based on the above evaluation, the staff concludes that the AP1000 design changes are acceptable because they meet the guidance in SRP Section 13.5.2.1. The proposed DCD changes are acceptable, pursuant to 10 CFR 52.63(a)(1)(vii), on the basis that they contribute to the increased standardization of the certification information.