13.0 CONDUCT OF OPERATIONS

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13.0 CONDUCT OF OPERATIONS

13.1 Organizational Structure of Applicant

The staff of the U.S. Nuclear Regulatory Commission (NRC) reviewed the economic simplified boiling-water reactor (ESBWR) design control document (DCD), Tier 2, Revision 9, Section 13.1, in accordance with NUREG–0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)," issued March 2007 (SRP).

In ESBWR DCD Tier 2, Revision 9, Section 13.1, the applicant stated that the combined license (COL) applicant is responsible for describing the organizational structure applicable to conduct of operations. The staff finds this approach to describing and documenting the management and technical support organization acceptable. The COL applicant will describe and document the management and technical support organization. This is identified as COL Information Item 13.1-1-A in DCD Tier 2, Revision 9, Section 13.1.

13.2 Training

The staff reviewed DCD Tier 2, Section 13.2, in accordance with the 2007 version of the SRP. In DCD Tier 2, Revision 9, Section 13.2, the applicant stated that the COL applicant will do the following:

- Provide a description of, and the schedule for, the training program for reactor operators, senior reactor operators, and the licensed operator requalification program.

- Provide a description of, and the schedule for, the training program for nonlicensed plant staff.

- Incorporate the results of reviews of operating experience into training and retraining programs in accordance with the provisions of Three Mile Island (TMI) Action Plan Item (hereafter referred to as TMI Item) I.C.5, in NUREG–0737, "Clarification of TMI Action Plan Requirements."

- Identify the organization responsible for incorporating the results of these reviews into the training and retraining programs.

- Develop a plant staff training program, to cover all phases of plant operation, including preoperational testing and low-power operation, in accordance with the provisions of TMI Item I.G.1.

Based on the above, the staff finds the approach to the development of training programs acceptable. The COL applicant will address the development of the training programs. This is identified as COL Information Item 13.2-1-A and COL Information Item 13-2-2-A in DCD Tier 2, Revision 9, Section 13.2.

13.3 Emergency Planning

13.3.1 Regulatory Criteria

In its review of the ESBWR DCD Tier 2, Revision 9, the staff considered the regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) 52.48, which require, in part, that the application for a standard design be reviewed for compliance with the standards set out in 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and its appendices. Specifically, the staff reviewed the design-related information in DCD Tier 2, Revision 9, Section 13.3, against the applicable requirements in 10 CFR 50.34(f), 10 CFR 50.47(b), and Section IV.E of Appendix E to 10 CFR Part 50. In addition, the staff considered the requirements in 10 CFR 52.47(a)(8) and 10 CFR 52.47(a)(21) regarding generic safety issues (GSIs) that are technically relevant to the ESBWR design.

The staff determined compliance with these regulations by using the guidance in 2007 version of SRP Section 13.3 and Section 14.3.10. In addition, the staff used Regulatory Guide (RG) 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors" (Revision 4), which endorses NUREG–0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (Revision 1); and through it, NUREG–0696, "Functional Criteria for Emergency Response Facilities." The staff also used Generic Letter (GL) 82-33, "Supplement 1 to NUREG–0737—Requirements for Emergency Response Capability (Generic Letter No. 82-33)."

13.3.2 Summary of Technical Information

In DCD Tier 2, Section 13.3, the applicant stated that emergency planning is not within the scope of the ESBWR design and that the COL applicant will provide the emergency plan. The applicant further stated that the design basis of the standard plant does consider certain design features, facilities, functions, and equipment necessary for emergency planning, and it provided the information that is described below.

The technical support center (TSC) is located in the electrical building and is environmentally controlled to provide room air temperature, humidity, and cleanliness appropriate for personnel and equipment. The TSC will support 26 people and will provide the radiological protection and monitoring equipment necessary to ensure that radiation exposure to any person working in the TSC will not exceed 0.05 sievert (Sv) (5 roentgen equivalent in man [rem]) total effective dose equivalent (TEDE) for the duration of an accident. The TSC will have reliable voice and data communications with the control room and the emergency operations facility (EOF), and reliable voice communications with the operational support center (OSC), NRC operations centers, and state and local operations centers. The TSC will also have a workstation that is capable of displaying safety parameter display system (SPDS) parameters and control room communication of Emergency Response Data System (ERDS) data with the NRC operations center.

The OSC communications system will have at least one dedicated telephone extension to the main control room (MCR), one dedicated telephone extension to the TSC, and one telephone capable of reaching onsite and offsite locations, as a minimum. In DCD Tier 2, Revision 9, Section 13.3 and DCD Tier 2, Table 1.10-1, the applicant identified the following three COL information items relating to emergency planning:

- COL Information Item 13.3-1-A: The COL applicant is responsible for identifying the OSC and the communication interfaces for inclusion in the detailed design of the control room and TSC.

- COL Information Item 13.3-2-A: The COL applicant is responsible for the design of the communication system located in the EOF, in accordance with NUREG–0696. (See TMI Items III.A.1.2(1) and (2) in safety evaluation report [SER, hereafter referred to as this report] Section 13.3.3.1 below.)

- COL Information Item 13.3-3-A: The COL applicant will provide supplies at the site to decontaminate onsite individuals in the service building adjacent to the main change rooms.

The applicant also identified the following six additional COL information items in DCD Tier 2, Table 1.10-1 and the respective DCD sections, which relate to emergency planning:

- COL Information Item 1C.1-2-A: The COL applicant will address the requirements of Bulletin (BL) 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," regarding emergency preparedness and response actions for security-based events. (See DCD Tier 2, Section 1C.2, and the discussion about BL 2005-02 in Section 13.3.3.1 of this report.)

- COL Information Item 9.5.2.5-1-A: The COL applicant will describe the emergency notification system provisions required by 10 CFR 50.47(b)(6) and will address the recommendations described in IE BL 80-15, "Possible Loss of Emergency Notification System (ENS) with Loss of Offsite Power." (See DCD Tier 2, Revision 9, Section 9.5.2.5, and Section 9.5.2. of this report)

- COL Information Item 9.5.2.5-3-A: The COL applicant will describe the means of communication between the control room, TSC, EOF, state and local emergency operation centers, and radiological field personnel, in accordance with NUREG–0696 and NUREG–0654. (See DCD Tier 2, Revision 9, Section 9.5.2.5, and Section 9.5.2 of this report.)

- COL Information Item 9.5.2.5-4-A: The COL applicant will describe the communication methods from the control room, TSC, and EOF to NRC Headquarters, including establishment of the ERDS, in accordance with NUREG–0696. (See DCD Tier 2, Revision 9, Section 9.5.2.5 and Section 9.5.2 of this report.)

- COL Information Item 9.5.2.5-5-A: The COL applicant will describe the fire brigade radio system, in accordance with Regulatory Position 4.1.7 in RG 1.189, "Fire Protection for Nuclear Power Plants." (See DCD Tier 2, Revision 9, Section 9.5.2.5 and Section 9.5.2 of this report.)

- COL Information Item 14.3-1-A: The COL applicant shall provide emergency planning (EP) inspections, tests, analyses, and acceptance criteria (ITAAC), based on industry guidance. (See DCD Tier 2, Revision 9, Section 14.3.10 and Section 14.3 of this report.)

13.3.3 Staff Evaluation

The staff reviewed ESBWR DCD Tier 2, Revision 9, Section 13.3 and other relevant DCD sections against the applicable requirements and guidance identified above in Section 13.3.1 of this report. The applicant provided certain design-related features and functions of the TSC and

OSC as described in DCD Tier 2, Revision 9, Section 13.3, and identified several COL information items relating to emergency planning in DCD Tier 2, Revision 9, Section 13.3 and elsewhere in the DCD. As part of its review, the staff requested additional information from the applicant.

In request for additional information (RAI) 13.3-1, the staff asked the applicant to provide more detail regarding how it determined the TSC staffing size of 26, in relation to the facility's ability to support additional people during an emergency. In response to RAI 13.3-1, the applicant provided additional information regarding the physical size and areas of the TSC and stated that the available floor space of the TSC is more than sufficient to accommodate a significant increase of personnel without overcrowding. The applicant further stated that the existing staffing assumption of the TSC should be 27, rather than 26 (i.e., 22 utility personnel plus 5 NRC personnel). The staff finds this acceptable, because it provides a TSC that is sufficient to accommodate and support licensee and NRC pre-designated personnel, consistent with the applicable criteria in NUREG–0696. Therefore, RAI 13.3-1 is resolved.

In RAI 13.3-2, the staff asked the applicant to provide more detail concerning the proximity of the TSC to the control room, including whether any security barriers exist between the two facilities. In response to RAI 13.3-2, the applicant stated that the TSC is housed in the electrical building at grade elevation and that access to the TSC from the control room is through an underground personnel tunnel. The entrance to the TSC is approximately 120 meters (131.23 yards) walking distance from the control room—including a stair climb of 6.65 meters (7.27 yards)—which can be easily covered in less than two minutes. There are no security control points along the pathway, except for card reader controlled doors at the control room exit and TSC entrance. The staff finds this acceptable because it identifies a TSC location that is consistent with the applicable criteria in NUREG–0696. Therefore, RAI 13.3-2 is resolved.

In RAI 13.3-3, the staff asked the applicant to provide more detail relating to the displays and instrumentation that will be available in the TSC. In response to RAI 13.3-3, the applicant stated that plant parameters are collected by the essential distributed control and information system (E-DCIS) and the nonessential distributed control and information system (NE-DCIS). Safety-related data is transmitted through the E-DCIS and NE-DCIS. The NE-DCIS has many different functions, including archiving and manipulating data, and can be accessed by TSC computers with connections to the plant NE-DCIS network. The plant does not have a dedicated SPDS; instead, the applicant has incorporated this capability into the NE-DCIS design. The staff finds this acceptable because it adequately describes the availability of technical data systems in the TSC, consistent with the applicable criteria in NUREG–0696. Therefore, RAI 13.3-3 is resolved. Subsequent to the resolution of RAI 13.3-3, the applicant renamed the E-DCIS and the NE-DCIS as the qualified distributed control and instrumentation system (Q-DCIS) and nonsafety-related distributed control and instrumentation (N-DCIS), respectively.

In RAI 13.3-4, the staff asked the applicant to provide more detail regarding the backup power capabilities of the TSC. In response to RAI 13.3-4, the applicant stated that the TSC obtains power from two-hour uninterruptible power supply (UPS) feeds from both trains A and B, which are part of the plant investment protection (PIP) loads. The PIP trains obtain backup power through the nonsafety onsite diesel generators, and the UPS feeds provide emergency lighting and informational display. In addition, a 72-hour UPS powers the E-DCIS systems and a two-hour UPS powers the NE-DCIS. In all cases, either offsite power or either of the two nonsafety onsite diesels can power and recharge these UPS sources. The staff finds this acceptable because it identifies sufficient alternate or backup TSC power sources, consistent with the applicable criteria in NUREG–0696. Therefore, RAI 13.3-4 is resolved.

In RAI 13.3-5, the staff asked the applicant to provide more detail regarding the level of radiological protection provided by the TSC ventilation system. In response to RAI 13.3-5, the applicant stated that each of the 100-percent capacity redundant heating, ventilation, and air conditioning (HVAC) trains has a 100-percent capacity filter train, consisting of high-efficiency particulate air and charcoal filtration, to provide radiological protection to TSC occupants. The TSC HVAC subsystem automatically transfers from its normal operation mode to its radiological mode upon detection of radioactivity at the outside air intakes to limit the introduction of airborne radiation into the TSC, such that the radiation exposure to any person in the TSC will not exceed 0.05 Sv (5 rem) TEDE for the duration of an accident.

In RAI 13.3-5 S01, the staff asked the applicant to provide additional information concerning the level of radiological protection to TSC communications personnel. In its response, the applicant provided additional information relating to the habitability and occupancy of the TSC. The staff found the applicant's response inadequate because it did not clearly address whether the TSC communication personnel would perform their duties in the TSC, or in Communications Room 5189. In DCD Tier 2, Figure 1.2-26, Communications Room 5189 is located outside, and across the hall from, the TSC. (Figure 1.2-26 contains security-related information that is withheld from public disclosure under 10 CFR 2.390.) As such, Communications Room 5189 would not have adequate radiological protection because it is not within the TSC ventilation system.

In RAI 13.3-5 S02, the staff asked the applicant to: (1) clarify an apparent contradiction relating to the ESBWR's compliance with the requirements of NUREG–0696, (2) address concerns relating to the location of Communications Room 5189 outside the TSC, and (3) clarify or retract the statement that TSC functions would be transferred to the EOF if the TSC facility becomes uninhabitable. In its response, the applicant deleted the contradictory language relating to compliance with NUREG–0696 and retracted the statement addressing the transfer of TSC functions to the EOF. In addition, the applicant explained that personnel would perform communications tasks in the TSC offices (where communications devices would be located) and not in Communications Room 5189. In DCD Tier 2, Figure 1.2-26, the applicant also redesignated Communications Room 5189 as "Communications Equipment Room 5189." The staff finds this response acceptable because it provides the appropriate level of radiological protection to TSC personnel, consistent with the applicable criteria in NUREG–0696. Therefore, RAI 13.3-5 is resolved.

During its review, the staff found that the applicant had included information in DCD Tier 2, Section 13.3.3.2, associated with the EOF requirements in 10 CFR 73.55(e) and (f), that addressed the backup power supply for non-portable communications equipment. The staff believed that this information should be addressed in DCD Tier 2, Section 13.6, rather than in Section 13.3.3.2. In RAI 13.3-7, the staff asked the applicant to revise the DCD Tier 2, accordingly. In its response to RAI 13.3-7, the applicant stated that it will address the information in revised Sections 13.6.1.1.4 and 13.6.1.1.7, and it deleted the EOF requirements in DCD Tier 2, Section 13.3.3.2 associated with 10 CFR 73.55(e) and (f). The staff finds this acceptable. Therefore, RAI 13.3-7 is resolved.

In RAI 13.3-8, the staff asked the applicant to address the structural characteristics of the electrical building regarding the wind and flood design criteria in NUREG–0696 for buildings that house the TSC complex. In its earlier response to RAI 13.3-1, the applicant stated that the TSC is housed in the electrical building (at grade elevation), which is constructed of reinforced concrete and classified as nonsafety-related and non-seismic Category (NS). The applicant did not address the electrical building's structural characteristics in terms of winds and floods with a

recurrence frequency of 100 years. In its subsequent response to RAI 13.3-8, the applicant modified the relevant design bases in DCD Tier 2, Table 2.0-1 and other DCD sections, and provided specific wind, flood, and seismic design criteria for the electrical building. The applicant stated that the maximum wind speed used for the electrical building's design exceeds the standard plant site parameter 100-year wind speed, and the ground floor elevation is above the maximum flood level. The staff finds this response acceptable because it adequately describes the TSC structural characteristics, consistent with the applicable criteria in NUREG–0696. Therefore, RAI 13.3-8 is resolved.

In accordance with the requirements in 10 CFR 52.47(b)(1), a design certification application (DCA) must contain proposed ITAAC. During its review, the staff found that the applicant did not propose EP ITAAC. In RAI 14.3-150, the staff asked the applicant to provide ITAAC for those design features, facilities, functions, and equipment necessary for EP, for which the applicant is seeking design certification. In its response to RAI 14.3-150, the applicant stated that site-specific differences make it impossible to develop generic (i.e., applicable to all sites) EP ITAAC; and that the site-specific COL applications will provide the EP ITAAC. In DCD Tier 2, Section 14.3.10, the applicant included COL Information Item 14.3-1-A, which states that the COL applicant shall provide EP ITAAC, based on industry guidance (see Section 13.3.2 of this report).

At the COL stage, 10 CFR 52.80(a) requires a COL applicant that references the certified design to include in the COL application the proposed ITAAC, "including those applicable to emergency planning." Consistent with the 2007 version of SRP, Section 14.3.10, a COL applicant must include in its application any necessary EP ITAAC associated with the proposed emergency response facilities that are not identified in the standard design application. Furthermore, Section C.III.7 of RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," states, in part, that the COL applicant must propose a complete set of ITAAC that addresses the entire facility, including EP ITAAC. This is addressed by COL Information Item 14.3-1-A, which states that the COL applicant shall provide EP ITAAC, based on industry guidance. If a referenced standard design application includes EP ITAAC, they would carry forward into the COL application. The staff's evaluation of emergency planning at the standard design application stage allows for, but does not require, EP ITAAC. Therefore, the staff finds that the absence of proposed EP ITAAC in the DCD is acceptable.

13.3.3.1 *Generic Issues*

The 2007 version of SRP Section 13.3 states that the majority of emergency planning requirements associated with new reactor applications are programmatic in nature and supplement physical facilities and equipment. Although the COL applicant must address all aspects of emergency planning, the standard design may address design-related features in support of emergency preparedness and response. Emergency planning features addressed in an application for a standard design certification must be technically relevant to the design, not site specific, and usable for a multiple number of units or at a multiple number of sites.

As required by 10 CFR 52.47(a)(8), an applicant for a standard DC must demonstrate compliance with any technically relevant portions of the TMI requirements set forth in 10 CFR 50.34(f), except paragraphs (f)(1)(xii), (f)(2)(ix), and (f)(3)(v). In DCD Tier 2, Appendix 1A, Table 1A-1, the applicant addressed all TMI action plan items listed in 10 CFR 50.34(f), including those associated with emergency planning, and described the respective resolution for the ESBWR standard design.

In addition, 10 CFR 52.47(a)(21) requires the applicant to propose resolutions of unresolved safety issues (USIs) and medium- and high-priority GSIs identified in NUREG–0933, "Resolution of Generic Safety Issues." These issues must be technically relevant to the design, and identified in the version of NUREG–0933 current on the date six months prior to the application docket date. Consistent with 10 CFR 52.47(a)(21), in DCD Tier 2, Section 1.11, Table 1.11-1, the applicant identified issues that are technically relevant to the ESBWR design. DCD Tier 2, Revision 9, Section 1.11 references NUREG–0933 and its supplements through Supplement 30.

As part of its program to disseminate information on operational reactor experience to the nuclear industry, the NRC issues generic communications when it believes a significant safety-related event or condition at one or more facilities potentially applies to other facilities. The staff typically issues a GL or BL that requires licensees to inform the NRC regarding what actions they have taken or will take to address an event, condition, or circumstance that is both potentially significant to safety and generic. Potential safety issues highlighted in NRC generic communications have resulted in the establishment of a USI or GSI and have also been incorporated into formal regulatory requirements. As required by 10 CFR 52.47(a)(22), an applicant for a standard design certification must demonstrate how operating experience insights have been incorporated into the plant design. In DCD Tier 2, Revision 9, Appendix 1C, in Table 1C-1, and Table 1C-2, the applicant identified GLs and BLs that are potentially applicable to the ESBWR design or operations.

The staff reviewed NUREG–0933 (through Supplement 30) and the generic issues (GIs) identified by the applicant in DCD Tier 2, Tables 1A-1, 1.11-1, 1C-1, and 1C-2. The following provides the staff's evaluation and resolution of the TMI requirement and other GSIs that are applicable to emergency planning and technically relevant to the design basis of the ESBWR standard plant.

TMI Items III.A.1.2(1) and (2): Upgrade Licensee Emergency Support Facilities—TSC and OSC

As discussed in NUREG–0933, TMI Item III.A.1.2 addresses the requirement for licensees to upgrade emergency support facilities by establishing a TSC, an OSC, and a near-site EOF for command and control, support, and coordination of onsite and offsite functions during reactor accident situations. TMI Item III.A.1.2 was resolved through its clarification in GL 82-33 (Supplement 1 to NUREG–0737) (discussed below), and the NRC's issuance of new requirements in 10 CFR 50.34(f)(2)(xxv). Additional requirements associated with emergency facilities appear in 10 CFR 50.47(b) and Section IV.E of Appendix E to 10 CFR Part 50. Specific guidance relating to emergency facilities also appears in NUREG–0696, which is referenced in GL 82-33. NUREG–0696 includes the TSC and OSC requirements in TMI Items III.A.1.2(1) and (2), respectively, such that compliance with NUREG–0696 will resolve TMI Items III.A.1.2(1) and (2).

In DCD Tier 2, Revision 9, Section 13.3, the applicant states that the EOF is not within the scope of the ESBWR standard plant. The staff agrees that the EOF is not within the scope of the ESBWR standard plant because it is an offsite facility (independent of the reactor design) that supports the reactor site during an emergency. As such, the EOF is site specific and not technically relevant to the ESBWR design. Therefore, only the TSC and OSC are technically relevant to the staff's review of the ESBWR design.

While DCD Tier 2, Section 13.3 states that emergency planning is not within the scope of the ESBWR design, the applicant described certain characteristics of the TSC and OSC, indicating that the design basis of the ESBWR standard plant includes design features, facilities, functions, and equipment necessary for emergency planning. In DCD Tier 2, Table 1A-1, the applicant addressed the resolution of TMI Item III.A.1.2(1) and (2) by stating that space for the TSC is included in the ESBWR standard design on the ground floor of the electrical building, and that the space provided is in conformance with NUREG–0696. DCD Tier 2, Table 1A-1 also identifies DCD Tier 2, Figure 1.2-26, which shows the TSC location in the electrical building. In addition, Table 1A-1 states that provisions for an onsite OSC are discussed in DCD Tier 2, Revision 9, Section 13.3, which states (in COL Information Item 13.3-1.A) that the COL applicant is responsible for identifying the OSC.

The staff finds that the applicant has adequately addressed the requirements in 10 CFR 50.34(f)(2)(xxv), consistent with the applicable criteria in NUREG–0696, for an onsite TSC and OSC. Therefore, TMI Items III.A.1.2(1) and (2) are resolved for the ESBWR design.

GL 80-34: Clarification of NRC Requirements for Emergency Response Facilities

GL 80-34, "Clarification of NRC Requirements for Emergency Response Facilities at Each Site," provides NRC requirements for the TSC, OSC, and EOF. The NRC has finalized requirements in GL 80-34 and incorporated them into NUREG–0696, which provides more detailed design and functional criteria.

In DCD Tier 2, Revision 9, Table 1C-1, the applicant states that the ESBWR design includes provisions for a TSC and that DCD Tier 2, Revision 9, Section 13.3 describes the OSC and EOF. DCD Tier 2, Section 13.3, states that the COL applicant is responsible for identifying the OSC and certain other communications interfaces and that the EOF is not within the scope of the ESBWR standard plant design. In addition to addressing certain aspects of the TSC and OSC, the applicant further stated that NUREG–0696 contains the detailed guidance for these facilities and that complying with it is the responsibility of the COL applicant.

The staff agrees that the EOF is not within the scope of the ESBWR design because it is an offsite facility—independent of the reactor design—that supports the reactor site during an emergency. As such, the EOF is site specific and not technically relevant to the ESBWR design. The staff finds that the limited extent to which the applicant has described certain design-related aspects of the TSC and OSC in DCD Tier 2, Revision 9, Section 13.3, is acceptable because the relevant requirements in GL 80-34 are addressed and this level of information is consistent with the applicable regulations and guidance. Therefore, GL 80-34 is resolved for the ESBWR design.

GL 81-10: Post-TMI Requirements for the EOF

GL 81-10, "Post-TMI Requirements for the Emergency Operations Facility," clarifies NRC requirements for emergency support facilities, including TMI Item III.A.1.2. In addition, GL 81-10 states that NUREG–0696 will provide more detailed design and functional criteria for emergency facilities than previously prescribed.

In DCD Tier 2, Table 1C-1, the applicant refers to its response to GL 80-34 (see above) for an evaluation of its compliance with GL 81-10. The staff finds this acceptable because GL 81-10 and GL 80-34 basically address the same emergency facility requirements, all of which have been finalized and incorporated into NUREG–0696. Furthermore, the resolution of TMI

Item III.A.1.2 (discussed above) also addresses the incorporation of emergency facility requirements into NUREG–0696. Therefore, GL 81-10 is resolved for the ESBWR design.

GL 82-33: Supplement 1 to NUREG–0737—Requirements for Emergency Response Capability

GL 82-33 (Supplement 1 to NUREG–0737) clarifies the certain post-TMI requirements for emergency response capability, including TMI Item III.A.1.2 criteria associated with emergency support facilities (i.e., TSC, OSC, and EOF). GL 82-33 also addresses accident monitoring instrumentation, discussed in Sections 7.1.1.3.4 and 7.5.2.3 of this report, and human factors considerations associated with emergency facilities, discussed in Section 18.8 of this report.

GL 82-33 references, and includes the basic facility requirements from, NUREG–0696, which is intended to be used as a source of guidance and information. NUREG–0696 provides the detailed design and functional criteria relating to emergency support facilities and includes the comparable requirements in GL 82-33. As discussed above, in TMI Item III.A.1.2 and GL 80-34, the guidance in NUREG–0696 applies to the TSC and OSC, while the EOF is not within the scope of the ESBWR design.

Since NUREG–0696 includes the TSC and OSC requirements in GL 82-33, the applicability of NUREG–0696 to the TSC and OSC (described in DCD Tier 2, Revision 9, Section 13.3) resolves the comparable (TMI Item III.A.1.2) requirements in GL 82-33. Furthermore, in DCD Tier 2, Revision 9, Table 1C-1, the applicant references Appendix 1A regarding the resolution of GL 82-33. In Table 1A-1 of Appendix 1A, the applicant addressed the resolution of TMI Item III.A.1.2 for the TSC and OSC. Therefore, GL 82-33 is resolved for the ESBWR design, to the extent it relates to the TSC and OSC in TMI Item III.A.1.2.

BL 2005-02: Emergency Preparedness and Response Actions for Security-Based Events

In DCD Tier 2, Appendix 1C, Table 1C-2, the applicant identified BL 2005-02, “Emergency Preparedness and Response Actions for Security-Based Events”. The corresponding evaluation result in Table 1C-2 states that BL 2005-02 is site specific and, therefore, not within the scope of a design certification. Furthermore, the COL applicant will address the requirements of BL 2005-02 regarding emergency preparedness and response actions for security-based events. The applicant identified COL Information Item 1C.1-2-A in Appendix 1C and in DCD Tier 2, Table 1.10-1, which states that the COL applicant will address the requirements of BL 2005-02 regarding emergency preparedness and response actions for security-based events.

The staff agrees that the issues concerning emergency preparedness in BL 2005-02 are site specific, because they cover program areas that are not related to the ESBWR design certification, and the COL applicant will address them. These program areas include: (1) security-based emergency classification levels and emergency action levels, (2) NRC notifications, (3) onsite protective measures and actions, (4) emergency response organization augmentation, and (5) the drill and exercise program. Therefore, BL 2005-02 is resolved for the ESBWR design, to the extent it relates to the emergency preparedness program.

13.3.4 Conclusion

On the basis of its review, as described above, the staff concludes that the applicant has adequately addressed the emergency planning design-related features and generic issues for

the ESBWR standard plant. Therefore, the information is acceptable and meets the applicable requirements in 10 CFR 50.34(f), 10 CFR 50.47(b), Section IV.E of Appendix E to 10 CFR Part 50, 10 CFR 52.47(a)(8) and (a)(21), and 10 CFR 52.48.

13.4 Operational Program Implementation

The staff reviewed DCD Tier 2, Revision 9, Section 13.4, in accordance with the 2007 version of the SRP.

RG 1.206 lists operational programs required by regulations that should be included in a COL application. SECY-05-0197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analysis, and Acceptance Criteria," states that COL applications should fully describe these operational programs.

In DCD Tier 2, Revision 9, Section 13.4, the applicant states that the COL applicant should fully describe operational programs, as defined in SECY-05-0197 and RG 1.206. In DCD Tier 2, Revision 6, Section 13.4.1, the applicant identified COL Information Item 13.4-1-A, which states, "The COL Applicant will develop a description of the Operational Programs." RG 1.206 also states that COL applicants, in accordance with Commission direction in the staff requirement memorandum associated with SECY-05-0197, should provide schedules for implementation of operational programs. In DCD Tier 2, Revision 6, Section 13.4.1, the applicant identified COL Information Item 13.4-2-A, which states, "The COL Applicant will provide implementation milestones for Operational Programs that are required by NRC Regulation."

On the basis of its review of DCD Tier 2, Revision 9, Section 13.4, the staff finds that the two COL information items identified in this section commit the COL applicant to developing a description of, and providing implementation milestones for, the operational programs specified in RG 1.206. RG 1.206 contains the operational programs and lists the specific regulations that relate to each program. Therefore, the staff finds the applicant's operational program implementation, as described in DCD Tier 2, Revision 9, Section 13.4, is acceptable.

13.5 Plant Procedures

The staff reviewed DCD Tier 2, Revision 9, Section 13.5, in accordance with the 2007 version of the SRP.

In DCD Tier 2, Revision 9, Section 13.5, the applicant stated the COL applicant is responsible for the following:

- Developing procedures that describe the administrative controls over activities that are important to safety for the operation of the facility
- Developing operating and maintenance procedures
- Developing operating procedures that direct operator actions during normal, abnormal, and emergency operations and that will include plant operations during periods when plant systems and equipment are undergoing test, maintenance, or inspection
- Describing the different classifications of procedures operators will use and the general format and content of the different classifications of procedures

- Describing the program for developing and implementing operating procedures
- Describing the program for developing and implementing emergency operating procedures
- Describing the classifications of maintenance and other operating procedures and the general objectives and character of each class and subclass of procedure

Six COL information items were identified in DCD Tier 2, Revision 9, Section 13.5 to address the plant procedure development plan identified as follows: COL Information Item 13.5-1-A, COL Information Item 13.5-2-A, COL Information Item 13.5-3-A, COL Information Item 13.5-4-A, COL Information Item 13.5-5-A, and COL Information Item 13.5-6-A. The staff finds the approach to procedure development, as described in SER Section 13.5, is acceptable.

13.6 Physical Security

13.6.1 Introduction/Overview/General

This section of the report documents the review of the physical security aspects of the ESBWR DCA submitted to the NRC by GE-Hitachi Nuclear Energy (GEH). DCD Tier 2, Revision 9, Section 13.6 describes the plant's physical security program, including those elements of physical protection and mitigative measures identified as being within the scope of the applicant's design. The description includes the required physical security elements of a DCA and references safeguards topical reports on physical protection and mitigative measures. It describes the design for protecting the plant against acts of radiological sabotage; specifically, the plant layout and protection of vital equipment are in accordance with 10 CFR 73.55, and applicable regulatory guidance. This section of the report incorporates the staff reviews of DCD Tier 2, Revision 9, Section 13.6; DCD Tier 1, Revision 9, Section 2.19, and Table 2.19-1; and the ITAAC for the physical security hardware and referenced safeguards topical reports.

The applicant responded to a total of 162 RAIs and 36 open items. The staff found that all responses regarding regulatory requirements are acceptable. All RAIs and open items are resolved and discussed in a comprehensive physical protection SER containing safeguards information. The DCD and topical reports identify vital equipment and vital areas; describe armed responder positions, physical security attributes (e.g., delay barrier[s] within the ESBWR design scope), and their characteristics; and analyze adversarial scenarios for design-basis threats (DBTs). Because this information is security sensitive, the comprehensive physical protection SER contains safeguards information and is not available for public disclosure. Those persons with the correct access authorization and need-to-know may view the safeguards information version of the physical protection SER, hereafter referred to as the safeguards information (SGI) SER, of the ESBWR which is located in the NRC's Secure Local Area Network, document number ES100016191.

13.6.2 Summary of Application

GEH provided the design description and information related to physical security in DCD Tier 1, Revision 9, Section 13.6, and Section 2.19, and referenced safeguards topical reports.

DCD Tier 1, Revision 9, Section 2.19, describes the design features and ITAAC for physical security hardware for the ESBWR design, and Table 2.19-1, describes the design commitments for physical security hardware that are within the scope of the ESBWR design.

DCD Tier 2, Revision 9, Section 13.6.1, states that the comprehensive security plan is the responsibility of the COL applicant and that the ESBWR design supports compliance with portions of 10 CFR Part 73, because all vital equipment is located in vital areas.

DCD Tier 2, Revision 9, Section 13.6.1.1, describes the composition of a site's physical protection program.

DCD Tier 2, Revision 9, Section 13.6.1.1.1, describes the design of the isolation zone, protected area (PA), controlled access points, and other physical barriers.

DCD Tier 2, Revision 9, Section 13.6.1.1.3, describes the design of aids capable of detecting and alarming attempted unauthorized entry into the PA or any vital area.

DCD Tier 2, Revision 9, Section 13.6.1.1.4, describes the design of security communications systems enabling continuous communication among the continuously manned alarm stations, on-duty security force personnel, and the MCR. Additional systems enable communications between the continuously manned alarm stations and local law enforcement agencies.

DCD Tier 2, Revision 9, Section 13.6.1.1.5, identifies the means to control access of personnel, vehicles, and materials into the PA. Access control measures ensure the positive identification and authorization of personnel and search of personnel, vehicles, and materials before entry into the PA. Additional controls limit access to vital areas to authorized personnel only. These controls include the use of numbered picture badges.

DCD Tier 2, Revision 9, Section 13.6.1.1.6, states that the lighting of the PA meets the requirements of Institute of Electrical and Electronics Engineers (IEEE) Standard (Std) 692, "IEEE Standard Criteria for Security Systems for Nuclear Power Generating Stations," and that the lighting design will comply with the lighting levels required by 10 CFR 73.55(i)(6) or an alternative approach to meeting illumination criteria.

DCD Tier 2, Revision 9, Section 13.6.1.1.7, states that site security systems will be powered from a reliable power supply meeting the requirements of IEEE Std 692 and that the design includes an UPS to power the security systems and nonportable security communications equipment. The security related secondary UPS is located in a vital area.

DCD Tier 2, Revision 9, Section 13.6.1.1.8, states that surveillance test procedures and frequencies include the frequencies needed to self check the safety-related distributed control and information system, as well as surveillance tests that are less frequent but more comprehensive. The COL applicant will identify a milestone for developing these surveillance test procedures and frequencies (COL Information Item 13.6-10-A). Other testing and maintenance procedures for security systems include those for physical barriers. The COL applicant will identify a milestone for developing these other testing and maintenance procedures (COL Information Item 13.6-11-A).

In DCD Tier 2, Revision 9, Section 13.6.2, GEH states that it is submitting a security plan, in accordance with 10 CFR 52.79(a)(35)(i), as a separate licensing document, which contains safeguards information and is protected against unauthorized disclosure in accordance with 10 CFR 73.21.

In DCD Tier 2, Revision 9, Section 13.6.3, GEH refers to its responses to RAIs 13.6-1 and 13.6-2. In response to RAI 13.6-1, the applicant provided a list of vital areas and components,

including location information and the locations of the central alarm station (CAS), secondary alarm station, and security-related emergency power supplies. The secondary alarm station was identified as a site-specific item. Additional details concerning the secondary alarm station are found in the ESBWR security assessment. The list of vital areas is SGI.

In its response to RAI 13.6-2, which asked for the ESBWR security ITAAC, the applicant stated that it would follow the industry-recommended generic ITAAC being developed through the industry's New Plant Security Task Force and approved by the NRC. The ESBWR security ITAAC captures the items that must be addressed by a DC applicant for the final 10 CFR Part 73 rulemaking. COL applicants that reference the ESBWR design ITAAC are responsible for addressing the security-related hardware ITAAC that are not within the scope of the ESBWR design.

13.6.3 Regulatory Basis

The NRC regulations for protecting nuclear power reactors in 10 CFR Part 73 include specific security and performance requirements that, when implemented, are designed to protect nuclear power reactors against acts of radiological sabotage, prevent the theft or diversion of special nuclear material, and protect safeguards information against unauthorized release.

Regulations in 10 CFR 73.1(a)(1) require the establishment of physical protection systems to protect special nuclear material against the DBT for radiological sabotage, and 10 CFR 73.55 describes the required physical protection for licensed activities. Pursuant to 10 CFR 50.34(c)(2) and 10 CFR 52.79(a)(35) and (36), licensees must prepare and maintain security plans that describe the security-related actions they will take to protect their facilities against acts of radiological sabotage. In the case of an applicant who describes the use of mixed-oxide plutonium fuel, the DCA also describes the protection of unirradiated mixed-oxide fuel assemblies.

Specifically, Subpart B of 10 CFR 52.47 requires that information submitted for a DC include performance requirements and design information sufficiently detailed to permit an applicant to prepare procurement specifications and construction and installation specifications. According to 10 CFR 52.48, the NRC will review applications filed under 10 CFR Part 52 for compliance with the standards set forth in 10 CFR Part 73.

The ESBWR design descriptions, commitments, and acceptance criteria for the security features, including the plant's layout and protection of vital equipment, as described in the DCA, are based on meeting the relevant requirements of the following Commission regulations:

- 10 CFR Part 50
- 10 CFR Part 52
- 10 CFR 73.1(a)(1)
- 10 CFR 73.55 Appendix B; Appendix C; Appendix G; and Appendix H
- 10 CFR 73.70(f)
- 10 CFR Part 74
- 10 CFR 100.21(f)

The 2010 version of SRP Section 13.6.2, Revision 1 was used by the staff to complete the physical security design certification review. The following regulations in 10 CFR 73.55 contain specific acceptance criteria:

- Section (e): The licensee shall locate vital equipment only within a vital area, which, in turn, shall be located within a PA, such that access to vital equipment requires passage through at least two physical barriers (as defined in 10 CFR 73.2) that perform their required function in support of the licensee's physical protection program. The physical barriers at the perimeter shall be separated from any other barrier designated as a physical barrier for a vital area within the PA. Isolation zones in outdoor areas adjacent to the physical barrier at the perimeter of the PA permit observation. An intrusion detection system detects penetration or attempted penetration of the PA barrier. Isolation zones and appropriate exterior areas within the PA are illuminated. The MCR has bullet-resistant external walls, doors, ceiling, and floors. Vehicle control measures, which include vehicle barrier systems, protect against the threat of assault by land vehicles.

- Section (g): The licensee shall control all points of personnel and vehicle access into a PA; this includes providing equipment capable of detecting firearms, explosives, incendiary devices, or other items that could be used to commit radiological sabotage, or a visual and physical search, or both. Unoccupied vital areas are locked and alarmed with activated detection systems that annunciate in both the CAS and secondary alarm station upon intrusion into a vital area. The individual responsible for the last access control function (controlling admission to the PA) must be isolated within a bullet-resisting structure.

- Section (i): All alarms required pursuant to this part must annunciate and display concurrently in at least two continuously staffed onsite alarm stations, at least one of which must be protected in accordance with the requirements of the CAS. The CAS must be inside the PA, and the interior must not be visible from the perimeter of the PA. The applicant must design and equip the continuously staffed CAS and secondary alarm station so that a single act cannot disable both. At least one alarm station must maintain the ability to detect and assess alarms, initiate and coordinate an adequate response to an alarm, summon offsite assistance, and provide command and control. The CAS shall be considered a vital area and be bullet-resistant, and associated onsite secondary power supplies for alarm annunciators and nonportable communication equipment must be located within vital areas. Alarm devices and transmission lines must be tamper indicating and be self-checking. Alarm annunciation on CAS/secondary alarm station computer monitoring stations shall indicate the type of alarm and its location. All emergency exits from protected and vital areas shall be alarmed and secured by locking devices.

- Section (j): Each security officer or armed-response individual shall be capable of maintaining constant communications with an individual in each continuously manned alarm station. Conventional telephone and radio- or microwave-transmitted two-way voice communications shall be established with local law enforcement authorities.

- Section (n): Each applicant shall develop test and maintenance provisions for intrusion alarms, emergency alarms, communications equipment, access-control equipment, physical barriers, and other security-related devices or equipment.

The NRC may apply the following regulatory guidance documents:

- RG 1.91, "Evaluations of Explosions Postulated To Occur on Transportation Routes Near Nuclear Power Plants."

- RG 4.7, "General Site Suitability Criteria for Nuclear Power Stations."

- RG 5.12, “General Use of Locks in the Protection and Control of Facilities and Special Nuclear Materials.”

- RG 5.65, “Vital Area Access Controls, Protection of Physical Security Equipment, and Key and Lock Controls.”

- RG 5.7, “Entry/Exit Control for Protected Areas, Vital Areas, and Material Access Areas,” Revision 1.

- RG 5.44, “Perimeter Intrusion Alarm Systems,” Revision 3.

- Information Notice 86-83, “Underground Pathways into Protected Vital Areas, Material Access Areas, and Controlled Access Areas.”

- “Nuclear Power Plant Security Assessment Format and Content Guide,” Information Systems Laboratories.

- SAND 2007-5591, “Nuclear Power Plant Security Assessment Technical Manual,” Sandia National Laboratory.

Section 14.3.12 of this report evaluates the ITAAC acceptance criteria pertaining to physical security that are derived from the following regulations:

- 10 CFR 73.1, as it relates to the prescribed requirements for the establishment and maintenance of a physical protection system and for protection against the DBT of radiological sabotage

- 10 CFR 73.55, as it relates to the requirements for physical protection against radiological sabotage of licensed activities in nuclear power reactors

- 10 CFR 73.70(f), as it relates to the requirements specific to alarm annunciation records

- 10 CFR 52.47(b)(1), which requires that a DCA contain the proposed ITAAC that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the DC will be built and operated in accordance with the DC; the provisions of the Atomic Energy Act of 1954, as amended (the Act); and NRC regulations

The COL applicant referencing a certified design is responsible for the site specific security operational programs to meet the requirements in 10 CFR 50.34(c)(2) or 10 CFR 52.79(a)(35)(i) and 10 CFR 52.79(a)(36)(i), (ii), and (iii). This is satisfied, in part, by describing a physical protection system and administrative programs and procedures for implementing a site specific protective strategy that demonstrates high assurance that the plant is protected against a DBT. The site specific physical protection system must be reliable and available and must implement defense-in-depth to provide a high assurance of protection. The following specific and performance requirements describe the security operational programs and the physical protection system: 10 CFR Part 26; 10 CFR 73.55; 10 CFR 73.56; 10 CFR 73.57; 10 CFR 73.58; and 10 CFR Part 74. Regulations in 10 CFR 52.79(a)(36)(i) or 10 CFR 50.34(d) and Appendix C to 10 CFR Part 73 require COL applicants to submit the security program and planning for a safeguards contingency. The performance and specific requirements in

Appendix B to 10 CFR Part 73 requires COL applicants to submit a training and qualification program for readiness of security personnel and responders.

Within this context, the DC applicant must address those elements or portions of physical protection systems that are considered within the scope of the design. However, the DC applicant may include descriptions of security systems or hardware, with supporting technical bases that go beyond the physical configuration for the scope of the design, provided that it is clearly stated that they are within the scope of the DC.

The staff used SRP Section 14.3.12 to review the applicant's ITAAC submittal. Section 14.3.12 of this report documents the staff's evaluation.

13.6.4 Technical Evaluation

The staff reviewed DCD Tier 1, Revision 9, Section 2.19 and Table 2.19-1; and DCD Tier 2, Revision 9, Section 13.6, and referenced safeguards topical reports.

In its review of the referenced safeguards topical reports, the staff identified areas in which it needed additional information to complete the review of the applicant's physical security design. The applicant responded to the staff's RAIs as discussed below.

The staff reviewed applicant submissions to determine if the GEH consideration of physical security in the ESBWR design was acceptable.

Upon the completion of their review, the staff finds that the applicant adequately addressed regulations and the SRP acceptance criteria that were identified as within the scope of their design.

13.6.5 Combined License Information Items

The staff reviewed the ESBWR descriptions and commitments for COL information items that a COL applicant referencing the ESBWR certified design must address.

13.6.5.1 *Acceptance Criteria*

Regulations in 10 CFR 52.47(b)(1), require a DC applicant to submit the proposed ITAAC that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design certification will be built and operated in accordance with the DC, the provisions of the Act, and the NRC's regulations. Section 14.3.12 of this document contains the staff's evaluation of the ITAAC for physical security hardware.

In addition to ITAAC, the staff also reviewed the following information that was submitted by applicants for the physical security design. The following information was provided by the applicant to meet the acceptance criteria identified in Section 13.6.3 of this report for physical security design certification. The details of this information are provided in the SGI SER for the ESBWR, which is stored in the automated database of the NRC's Secure Local Area Network Electronic Safe, document number ES100016191.

As required by 10 CFR 73.55(e)(9)(i), a DC applicant shall identify vital areas and a list of vital equipment[1], by location.

As required by 10 CFR 73.55(e)(9)(v) and (vi), a DC applicant shall identify the control room as a vital area and secondary power supply (for alarm annunciator equipment and nonportable communications) as within a vital area.

As required by 10 CFR 73.55(e)(9)(iii), a DC applicant shall provide the design of the locks and alarms of all unoccupied vital areas.

As required by 10 CFR 73.55(e)(5), a DC applicant shall provide the design describing the bullet resistance of the control room and the CAS.

As required by 10 CFR 73.55(g)(1)(i)(B), a DC applicant should identify locks used to protect the facility and special nuclear material as manipulative resistant.

13.6.5.2 *Technical Evaluation of Combined License Information*

The staff evaluated the COL information items identified in its review of the ESBWR DCA and contained in DCD Tier 2, Revision 9, Section 13.6.3. COL information items are those physical security requirements from the above six acceptance criteria that are either met partially or are not addressed by the DC applicant. The staff's evaluation determines whether the DCA adequately describes those physical security requirements so that a COL applicant would be able to address them during the COL licensing process. The DC applicant need not identify as COL information items those physical security elements required by regulation. However, for physical security elements partially met in the DCA, the DC applicant should explicitly identify which part of the requirement it will meet and which part the COL applicant referencing the design will be required to meet.

In COL Information Item 13.6-6-A, GEH stated that the COL applicant will provide a milestone for developing a program to control the issuance of security keys, as described in DCD Tier 2, Revision 9, Section 13.6.1.1.5.

In COL Information Item 13.6-7-A, GEH stated that the COL applicant shall describe the CAS and secondary alarm station as equal and redundant, such that all functions needed to satisfy the requirements of 10 CFR 73.55(i)(4) can be performed from either alarm stations.

In COL Information Item 13.6-8-A, GEH stated that the COL applicant shall demonstrate that the design of the security system precludes any single postulated security event that results in a degradation of the site security staff's ability to monitor and direct the response to a security event from either the CAS or secondary alarm station; this includes the power supplies to both alarm stations.

In COL Information Item 13.6-9-A, GEH stated that the COL applicant will identify a milestone for incorporating the provisions for alarm response procedures into the applicable procedures as discussed in DCD Tier 2, Revision 9, Section 13.6.1.1.3.

[1] The term "equipment" in 10 CFR 73.55(e) encompasses structures, systems, and components determined to be vital.

In COL Information Item 13.6-10-A, GEH stated that the COL applicant will identify a milestone for developing the surveillance test procedures and frequencies for Q-DCIS as discussed in DCD Tier 2, Revision 9, Section 13.6.1.1.8.

In COL Information Item 13.6-11-A, GEH stated that the COL applicant will identify a milestone for developing the other test and maintenance procedures as discussed in DCD Tier 2, Revision 9, Section 13.6.1.1.8.

In COL Information Item 13.6-12-A, GEH stated that the COL applicant will identify a milestone for developing a site response strategy to a confirmed security event that provides for taking specific actions as defined in DCD Tier 2, Revision 9, Section 13.6.3.

In COL Information Item 13.6-13-A, GEH stated that the COL applicant will identify a milestone for incorporating the provisions for security alarm response procedures into the applicable procedures as discussed in DCD Tier 2, Revision 9, Section 13.6.1.1.3.

In COL Information Item 13.6-14-A, GEH stated that the COL applicant will identify a milestone for incorporating into applicable procedures the administrative controls for work performed in cabinets for specific systems listed in the ESBWR security strategy as described in DCD Tier 2, Revision 9, Section 13.6.1.1.5.

In COL Information Item 13.6-15-A, GEH stated that the COL applicant will identify a milestone for incorporating the administrative controls for work on specific systems in the security assessment into applicable procedures as described in DCD Tier 2, Revision 9, Section 13.6.1.1.5.

In COL Information Item 13.6-16-A, GEH stated that the COL applicant will provide a site arrangement drawing that shows the location of specific bullet-resistant protected positions with engagement capabilities. In addition, the COL applicant will provide a description of the level of protection provided to security personnel stationed in the bullet-resistant protected positions from the effects of the equipment described in the DBT.

In COL Information Item 13.6-17-A, GEH stated that the COL applicant will provide a site arrangement drawing that shows the location of the PA fence, the isolation zone on either side of the PA fence, the vehicle barrier system, any red zone or delay fences, and any buildings or structures inside the PA that are not part of the certified design. In addition, the COL applicant will identify a milestone for demonstrating that the ESBWR security strategy remains valid.

In COL Information Item 13.6-18-A, GEH stated that the COL applicant will identify a milestone for determining if armed responders require ammunition greater than the amount normally carried to provide reasonable assurance of successful engagement of adversaries. This includes the necessary procedures to assure adequate ammunition is available.

In COL Information Item 13.6-19-A, GEH stated that the COL applicant will identify a milestone for updating the ESBWR security strategy to reflect site specific locations of specific bullet-resistant protected position engagement positions. The report will be updated to demonstrate that the security protective strategy can be implemented as described.

In COL Information Item 13.6-20-A, GEH stated that the features of the physical security system are covered, in part, by the standard ESBWR design, while other features are plant and site specific. Accordingly, the ESBWR standard ITAAC cover the physical plant security system and

address those features that are part of the standard design. The COL Applicant shall provide the plant and site-specific Physical Security ITAAC not covered by DCD Tier 1, Revision 9, Section 2.19.

On the basis of its review of identified COL Information Items 13.6-6-A through 13.6-20-A, the staff finds that these items appropriately address interface requirements between the referenced ESBWR physical protection system design and the COL applicant's design.

13.6.6 Conclusion

The staff finds that GEH has considered and prescribed physical security systems or features in the standard ESBWR design that provide protection against acts of radiological sabotage and theft of special nuclear material. The details of this information are provided in the SGI SER for the ESBWR, which is stored in the automated database of the NRC's Secure Local Area Network Electronic Safe, document number ES100016191. GEH has adequately described the plant layout for physical protection and has identified vital equipment and areas, in accordance with the requirements of 10 CFR 73.55. In Section 14.3.12 of this report, the staff evaluated the technical bases and assumptions related to ITAAC for physical security hardware and finds that they are acceptable.

GEH identified the issues in the following documents as being outside the scope of the ESBWR design: GL 89-007, "Power Reactors Safeguards Contingency Planning for Surface Vehicle Bombs"; GL 91-010, "Explosives Searches at Protected Area Portals"; and GL 91-003, "Reporting of Safeguards Events." The staff agrees that the issues in the above documents are outside the scope of the design and finds the GEH approach acceptable. The staff's review of the design addresses Task Action Plan Item A-29, "Nuclear Power Plant Design for the Reduction of Vulnerability to Industrial Sabotage."

For this stage of the licensing process, GEH has provided reasonable assurance that the standard ESBWR design will ensure adequate protection against acts of radiological sabotage and theft of special nuclear material. GEH has provided sufficient security information to support the issuance of a design certificate.