

13.6 Industrial Security

The NRC staff reviewed the physical security aspects of the early site permit (ESP) application to determine whether site characteristics are such that adequate security plans and measures can be developed.

13.6.1 Technical Information in the Application

In Section 13.6 of the SSAR, the applicant stated that it would extend the protected area of the existing Units 1 and 2 at the North Anna Power Station (NAPS) to accommodate any new units constructed on the ESP site. The applicant stated that the site characteristics are such that the applicable NRC regulations, guidance documents, and orders can be met. The applicant based this conclusion on the size of the NAPS site, which is sufficiently large to provide adequate distances between vital areas and the probable location of a security boundary.

In request for additional information (RAI) 13.6-1, the staff requested the applicant to describe how the ESP plant parameter envelope (PPE) and surrounding terrain features will provide at least 360 feet of distance (specified in Regulatory Guide (RG) 4.7, Revision 2, "General Site Suitability Criteria for Nuclear Power Stations," April 1998) between vital equipment/structures and physical protection components (e.g., protected area barriers and isolation zones). In its response, the applicant stated that the protected area and related isolation zone would be constructed to comply with the requirements of 10 CFR 73.55(c), and that the protected area barrier would be of sufficient size to support the security response strategy timelines.

Section 13.6 of the SSAR states that Dominion has a security program in place for the existing units and notes that the program complies with the NRC "Order for Interim Compensatory Measures," dated February 25, 2002, regarding waterborne threats. The SSAR further concludes that Dominion anticipates that it will continue to meet those requirements in the event that it adds new units to the site. Section 13.6 also states that the COL application would address final design features for the new units' power blocks and supporting buildings, as appropriate, to ensure adequate site security. Finally, SSAR Section 13.6 concludes that there are no security hazards created from nearby hazardous material facilities.

13.6.2 Regulatory Evaluation

In Sections 1.8 and 13.6 of the SSAR, the applicant identified Title 10, Section 100.21(f) of the *Code of Federal Regulations* (10 CFR 100.21(f)) and 10 CFR 73.55 as the applicable regulations and noted that RG 4.7 provides applicable guidance. The staff finds that the applicant correctly identified the applicable regulations and guidance, as requested in RAI 1.8-1.

The NRC regulations require that applicants for an ESP address characteristics of the proposed site that could affect security. Specifically, 10 CFR 52.17 requires that site characteristics comply with 10 CFR Part 100; 10 CFR 100.21(f) indicates that site characteristics must be such that applicants can develop adequate security plans and measures. In RG 4.7, Revision 2, the NRC provides amplifying guidance and notes that 10 CFR 73.55 describes physical protection requirements for nuclear power plants.

Review Standard (RS)-002 notes that the NRC staff has provided guidance to the first three prospective ESP applicants by three substantially identical letters (ML030980003 for the Dominion application). The RS adds that these letters should be used for review guidance for the ESP applications to which they apply. However, it also notes that the NRC's security orders referenced in the letters are, by their nature, subject to modification depending on changes in the terrorist threat. The security orders do not form part of the licensing basis of the early site permit and are not imposed as conditions of prospective permits. The security review of ESP applications is based on the requirements of 10 CFR Parts 100 and 73 or other applicable existing regulations.

13.6.3 Technical Evaluation

The staff reviewed the application and responses to its RAIs and examined aspects of the application during an onsite visit. The proposed ESP site is located on the shore of Lake Anna in Louisa County, Virginia, near two licensed nuclear power reactors (North Anna, Units 1 and 2) owned by Virginia Electric and Power Company, an affiliate of the applicant. The NAPS site is defined by a 5000-foot radius circle originating from the center of the partially constructed, but now abandoned North Anna Unit 3 (see Figure 1.2-4, note 3 in the application). The ESP PPE (site footprint) that bounds the prospective location for any new nuclear power reactors that might be constructed on the proposed ESP site is located directly west of the existing NAPS protected area and no closer than 800 yards to the site boundary.

Using the criteria set forth in 10 CFR 100.21(f), the staff identified and considered various characteristics of the site that could affect the establishment of adequate security plans and measures. The staff considered pedestrian land approaches, vehicular land approaches, railroad approaches, water approaches, potential "high-ground" adversary advantage areas, nearby road transportation routes, and culverts that could provide a pathway into the protected area.

With respect to pedestrian approaches, the staff found that various figures in the application (e.g., Figure 1.0-1) identify the applicant's PPE (within which all safety-related structures would be located if one or more reactors were to be constructed there). In RAI 13.6-1, the staff asked the applicant to identify its plans to address the guidance in RG 4.7, which specifies that applicants provide a minimum of 360 feet between protected area barriers and vital areas to allow for appropriate barriers, detection equipment, isolation zones, and vehicle barriers to protect vital equipment. In its response, the applicant stated that protected area barriers would be separated from vital area barriers, and be of sufficient size to support the security response strategy timelines. The staff concluded that the distance from planned locations of vital equipment and structures (which might be located anywhere in the PPE [ESP site footprint], because a design is not specified at the ESP stage) to the planned protected area boundary can be made sufficiently large that holders of a COL or construction permit could appropriately locate delay barriers, isolation zones, detection equipment, and vehicle barriers to protect vital equipment and structures.

With respect to water approaches, the staff notes that vital equipment for the existing NAPS units is sufficiently far from Lake Anna that restrictions to lake access are not required. The need for such restrictions for any new units would depend on the design of the units and their

location on the ESP footprint (PPE). The site configuration would not present any significant impediments to development of such restrictions.

With respect to vehicular land and railroad approaches, the staff identified existing roads, rail spurs, and site terrain features. The staff concluded that the location of existing roads and site terrain features does not preclude the establishment of adequate vehicle control measures to (1) prevent the use of a land vehicle to gain unauthorized proximity to vital areas, and (2) protect against a vehicle bomb. The staff based its conclusion on the fact that the location of the existing vehicle checkpoint, which could be used for vehicular control to the ESP site, has adequate standoff distance from the PPE to mitigate vehicle-bomb overpressure effects. Further, the staff confirmed during a site visit that the terrain features on all borders of the site are amenable to implementation of a vehicle barrier system.

With respect to threats posed by deliberate vehicle explosions on nearby transportation routes, the staff noted that, in SSAR Section 2.2.3.1.1, the applicant analyzed a gasoline tanker explosion involving 8500 gallons of gasoline detonated on Virginia Highway 652 at a point 1.5 miles from the proposed site. The staff performed an independent calculation for the tanker explosion and found the results to differ from the applicant's because the applicant did not take into account the 240 percent (mass) equivalence for substances subject to vapor-phase explosions (see RG 1.91, Revision 1, "Evaluations of Explosions Postulated to Occur on Transportation Routes Near Nuclear Power Plants," issued February 1978). Nevertheless, the staff's analysis reached the same conclusion that such an event would not result in an overpressure of greater than 1 psi at the site boundary. The pressure threshold for human eardrum rupture is 5 psi, which is the first point of human incapacitation (see U.S. Army Technical Manual 5-1300, "Structures to Resist the Effects of Accidental Explosions," issued November 1990). A peak positive overpressure of 1 psi is a conservative threshold below which no significant damage would be expected for structures, components, and systems of concern (RG 1.91). The applicant did not identify any other hazardous materials transported on the nearby roadways.

The staff examined the overall site terrain with respect to features (including existing manmade features, such as culverts, as well as natural features) that potential adversaries could use to their advantage. The features that exist at the ESP site do not preclude the establishment of adequate security plans and measures.

The COL applicant will need to provide specific designs for protected area barriers, since such design information is not available at the ESP stage. This is **COL Action Item 13.6-1**.

13.6.4 Conclusions

As set forth above, the staff examined the site characteristics with respect to their potential to affect the establishment of adequate security plans and measures. The staff examined pedestrian, vehicle, and water approaches, including existing culverts, nearby railroad lines, and other transportation routes, as well as terrain features. Based on the above evaluation, the staff concludes that the ESP site characteristics would allow an applicant for a COL or CP to develop adequate security plans and measures for reactor(s) that it might construct and operate on the ESP site.

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