



Nuclear Regulatory Commission
 Exhibit # - SNC00001K-MA-BD01
 Docket # - 05200011
 Identified: 03/23/2009

Admitted: 03/23/2009
 Rejected:

Withdrawn:
 Stricken:

3.1 External Appearance and Plant Layout

3.1.1 Existing Site

The 3,169 acre VEGP site is located on a coastal plain bluff on the southwest side of the Savannah River in eastern Burke County. The site exclusion area boundary (EAB) is bounded by River Road, Hancock Landing Road and 1.7 miles of the Savannah River (River Miles 150.0 to 151.7). The property boundary entirely encompasses the EAB and extends beyond River Road in some areas. The site is approximately 30 river miles above the U. S. 301 bridge and directly across the river from the Department of Energy’s Savannah River Site (Barnwell County, South Carolina). The VEGP site is approximately 15 miles east north east of Waynesboro, Georgia and 26 miles southeast of Augusta, Georgia, the nearest population center (i.e. having more than 25,000 residents). It is also about 100 miles from Savannah, Georgia; and 150 river miles from the mouth of the Savannah River. The existing VEGP Units 1 and 2 are Westinghouse pressurized water reactor (PWR) plants licensed by the US Nuclear Regulatory Commission (NRC) in 1987 and 1989, respectively, have been in commercial operation since that time. Each unit has a thermal power rating of 3,565 megawatts thermal (MWt). Plant Wilson, a six-unit oil-fueled combustion turbine facility constructed in 1974 and owned by Georgia Power Company (GPC), is also located on the VEGP site.

VEGP Units 1 and 2 each has a concrete containment building adjacent to a common steel and metal-sided turbine building with a reinforced concrete roof. The units share a concrete auxiliary building, control building, and fuel handling building. Supporting structures located on the site include two natural draft cooling towers (one per unit), associated intake and discharge structures, service water cooling towers, a water treatment building, a switchyard, and a training center. Figure 3.1-1 provides an aerial photograph of the existing VEGP site and Figure 3.1-3 is a site drawing illustrating the existing plant layout and the proposed AP1000 layout.

The existing VEGP site was originally a four-unit site. The construction permit granted by the NRC reflected four units, and the site grading work was done to support four units. However, only two units were actually constructed.

3.1.2 Proposed Site

SNC has selected the Westinghouse AP1000 certified plant design for the VEGP ESP application. The proposed AP1000 units, to be referred to as Units 3 and 4, will be located west of and adjacent to the existing Units 1 and 2 as shown in Figure 3.1-2. The AP1000 has a thermal power rating of 3,400 MWt, with a net electrical output of 1,117 megawatts electrical (MWe). The projected commercial operation dates for Units 3 and 4 are May 2015 and May 2016, respectively.

The AP1000 units and support facilities proposed for the VEGP site will be designed around the Westinghouse standardized unit approach. The standardized unit design does not share

common support facilities and structures between units. Each AP1000 unit is based on a “stand alone” concept and consists of five principal generation structures: the nuclear island, turbine building, annex building, diesel generator building, and radwaste building. Structures that make up the nuclear island include the containment building, shield building, and auxiliary building. The turbine building is a rectangular metal-siding building with its long axis oriented radially from the containment building. The turbine building will be located on the north end of the power block. The shield building and auxiliary building are constructed of reinforced concrete. The annex building is constructed of a combination of reinforced concrete and steel-framed structure with insulated metal siding. The diesel generator building is a steel-framed structure with insulated metal siding. The radwaste building, which will be located on the south end of the unit layout, will be a steel-framed structure with a combination of prefabricated concrete panels and metal siding. Units 3 and 4 will be constructed from materials architecturally similar and similar in color and texture to those used on Units 1 and 2. Figure 3.1-4 is an artist’s rendering of the AP1000 design.

Units 3 and 4 will be constructed west of the Units 1 and 2 plant complex. The new units will be located in approximately the same area proposed for the original Units 3 and 4. Most of this area has already been graded to the same elevation as the current Units 1 and 2 and is planted in pine trees. The area also contains access roads, slabs from old construction buildings, and several structures supporting operation of the existing units. Unit 3 power block structures will be separated from the Unit 2 structures by approximately 1,200 ft. The center point of Unit 3 containment will be approximately 1,700 ft west and 400 ft south of the center point of the Unit 2 containment. The Unit 4 footprint will be separate from but adjacent to the Unit 3 footprint. The center point of Unit 4 will be approximately 800 ft west of the center point of Unit 3. The power block footprints of Units 3 and 4 will require an area of 75.2 acres. The proposed location integrates well with the existing units, and the layout has been designed to give the appearance of a plant site originally designed for four units. Figure 3.1-2 provides an artist’s rendering of the VEGP site with the existing nuclear units and the two proposed units.

Units 3 and 4 will share a common river intake structure and certain support structures such as office buildings, water, wastewater, and waste-handling facilities. Paved site roadways will connect the new units to the rest of the VEGP site, providing routine and non-routine access to the existing and new units with minimal disturbance of the area.

The circulating water system for the new units will include two concrete natural-draft hyperbolic cooling towers (one for each unit) and common river intake and discharge structures. The Savannah River will be used for make-up water for the circulating water and the turbine plant cooling systems. The plant discharge will be returned to the Savannah River at a point downstream of the plant discharge for the existing units. The new river intake and discharge structures will be located at a sufficient distance from the existing river intake and discharge facilities to minimize any operational impacts to the existing units and any cumulative

environmental impacts to the aquatic ecosystem. These facilities will be designed and constructed from materials architecturally similar to those used for Units 1 and 2.

The proposed natural-draft cooling towers will be architecturally similar to the existing cooling towers and will be located south of the proposed units as indicated in Figure 3.1-3. The cooling towers will be approximately 600 ft high and require an area of 69.3 acres for both towers and their supporting facilities.

In addition to the natural-draft cooling tower footprint, the new units also require space for the service water system cooling towers. These mechanical draft cooling towers will require an area of approximately 0.5 acre per unit, will be approximately 60 ft high, and will be located within the AP1000 power block area.

The elevation for the new units and associated cooling towers will be approximately the same elevation as the existing nuclear units. This will result in a consistent visual effect and promote a more pleasing overall aesthetic view (Figure 3.1-2).

Existing infrastructure will be modified to integrate the new units with the existing units; however, none of the existing units' structures or facilities that directly support power generation will be shared. The existing switchyard will be modified to provide interconnections with the new switchyard for the proposed units, and the transmission lines modified and rerouted as required to incorporate the new generation capacity into the electric grid. The existing security perimeter will be expanded to include the new units. The training center will be expanded to support the training needs for the new units. In addition, other support facilities such as the existing sewage treatment facility will be expanded to serve all four units. Existing administrative buildings, warehouses, and other minor support facilities will be used, expanded, or replaced, based on prudent economic and operational considerations. Figure 3.1-3 shows the integration of the new and existing units as well as site roadways and access.

After the completion of new unit construction, areas used for construction support will be graded, landscaped, and planted to enhance the overall site appearance. Previously forested areas cleared for temporary construction facilities will be revegetated, and harsh topographical features created during construction will be contoured to match the surrounding areas. These areas could include equipment laydown yards, module fabrication areas, concrete batch plant, areas around completed structures, and construction parking.



Figure 3.1-1 Photograph of Existing VEGP Site (View Looking Northeast)



Figure 3.1-2 Artist's Conception of New AP1000 Units Adjacent to Existing Nuclear Facility (View Looking Northeast)