U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

DIVISION OF WASTE MANAGEMENT AND ENVIRONMENTAL PROTECTION

ENVIRONMENTAL ASSESSMENT RELATED TO THE RENEWAL OF THE H.B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 INDEPENDENT SPENT FUEL STORAGE INSTALLATION LICENSE SPECIAL NUCLEAR MATERIALS LICENSE NO. SNM–2502

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ACRONYMS AND ABBREVIATIONS

ANS	American Nuclear Society
ANSI	American National Standards Institute
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CP&L	Carolina Power and Light, Inc.
gpm	gallons per minute
Gy	gray
HBRSEP	H.B. Robinson Steam Electric Plant
hr	hour
IPEEE	individual plant examination of external events
ISFSI	Independent Spent Fuel Storage Installation
km	kilometer
L	liter
m	meter
mi	mile
mrem	milliroentgen equivalent man
mSv	millisievert
NMSS	Office of Nuclear Material Safety and Safeguards
NRC	U.S. Nuclear Regulatory Commission
PEC	Progress Energy Carolinas, Inc.
PGA	peak ground acceleration
s	second
SNM	special nuclear material
SSR	State Secondary Route
yr	year

ENVIRONMENTAL ASSESSMENT
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H.B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
INDEPENDENT SPENT FUEL STORAGE INSTALLATION LICENSE
SPECIAL NUCLEAR MATERIALS LICENSE SNM–2502

1.0 INTRODUCTION

1.1 Description of the Proposed Action

By letter dated February 27, 2004 (Lucas, 2004a), Carolina Power and Light Company (CP&L), now doing business as Progress Energy Carolinas, Inc. (PEC), submitted an application to the U.S. Nuclear Regulatory Commission (NRC) requesting renewal of NRC license SNM–2502 to operate the H.B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP), Independent Spent Fuel Storage Installation (ISFSI), located near Hartsville, South Carolina. The application for renewal was docketed for a detailed safety review on April 7, 2004 (Regan, 2004). The current site-specific license will expire on August 31, 2006. The HBRSEP ISFSI is presently loaded to capacity, and the renewal request does not involve any additional construction or inventory.

This license application includes a request for exemption from 10 CFR 72.42(a), which specifies the term of an ISFSI license of 20 years. PEC requests exemption from this requirement and proposes a license period of 40 years. The longer period is being requested to allow interim spent fuel storage for the remainder of the HBRSEP period of operation and transfer to a federal repository for permanent disposal of the waste.

This environmental assessment was prepared in accordance with NRC requirements in 10 CFR 51.21 and 51.30 and with the associated guidance in the NUREG–1748, "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs" (NRC, 2003a). An environmental assessment is defined by the Council on Environmental Quality in 40 CFR 1508.9 as a concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact. NRC also prepares a detailed safety review, which documents the safety evaluation for this license action.

A holder of an NRC license for a power reactor in accordance with 10 CFR Part 50 can construct and operate an ISFSI at that power reactor site according to the general license provisions of 10 CFR Part 72, or may apply for a separate site-specific license. The PEC license is a site-specific license granted in accordance with the regulations of 10 CFR Part 72.

1.2 Supporting Documents

Documents evaluated in preparing this environmental assessment include the PEC request for renewal of the HBRSEP ISFSI License (Lucas, 2004a). The renewal request includes appendixes containing a safety analysis report supplement (Lucas, 2004b), technical specification changes (Lucas, 2004c), an environmental report supplement (Lucas, 2004d), and a copy of the most recent revision to the HBRSEP ISFSI Safety Analysis report (Lucas, 2004e). Additional technical information about the HBRSEP and surrounding area was contained in a

Generic Environmental Impact Statement for Renewal of the HBRSEP license (NRC, 2003b) and the HBRSEP license renewal environmental report (CP&L, 2002).

1.3 Purpose and Need for the Proposed Action

The HBRSEP ISFSI renewal is needed to provide continued spent fuel storage capacity during the proposed license term of the HBRSEP. Failure to renew the HBRSEP ISFSI license will cause the license to expire on August 31, 2006, and stored spent fuel would have to be transferred to another licensed facility and decommissioning would begin. In their renewal request (Lucas, 2004a), PEC indicates renewal of the HBRSEP ISFSI license for a 20-year period would not allow sufficient time to complete plant operations and ship the stored fuel to a licensed disposal facility. Based on the expected limits on the annual amount of fuel that can be shipped to a potential high-level waste repository and the anticipated schedule for opening such a facility, PEC estimates it would not be able to ship all the stored fuel before a 20-year license term for the HBRSEP ISFSI expires (Lucas, 2004d). The HBRSEP license expires on July 31, 2010; however, on June 14, 2002, PEC applied for a 20-year renewal of the plant operating license. If the HBRSEP license renewal is granted, that license would expire on July 31, 2030. A 20-year renewal of the existing HBRSEP ISFSI license would expire on August 31, 2026, 4 years before the proposed HBRSEP license expiration date, thereby requiring a third license renewal for the HBRSEP ISFSI to complete shipments to a final disposal facility.

2.0 THE PROPOSED ACTION

The proposed action is renewal of NRC license SNM–2502 to operate the HBRSEP ISFSI for a term of 40 years. Renewal of the HBRSEP ISFSI license is needed to maintain sufficient onsite spent fuel storage capacity for the proposed period of power plant operations and subsequent shipment of stored fuel offsite. The HBRSEP ISFSI was licensed on August 31, 1986. PEC indicates no changes to HBRSEP ISFSI technical specifications are needed for the proposed license renewal (Lucas, 2004c). Detailed descriptions of the HBRSEP ISFSI components are provided in Lucas (2004b,d) and Lucas (2004e). A summary of the HBRSEP ISFSI and associated dry cask storage system is provided in the following section.

2.1 Description of HBRSEP ISFSI and Dry Cask Storage System

PEC owns and operates a 2,339-megawatts-thermal nuclear generating unit (Unit No. 2) and a 185-megawatts-electric fossil-fueled generating unit (Unit No. 1) at the site near Hartsville, South Carolina. Figure 2-1 shows the location of the HBRSEP in relation to other local features. Figure 2-2 shows the location of the ISFSI in the proximity of other site features. The HBRSEP ISFSI is located within the HBRSEP protected area approximately 183 m [600 ft] west of the HBRSEP containment building (Lucas, 2004e). The HBRSEP ISFSI uses the NUHOMS® system for horizontal, dry storage of irradiated fuel assemblies in a concrete module (Lucas, 2004e). Principal components of the system include the concrete storage module and a steel dry shielded canister with an internal basket that holds the fuel assemblies. Each of eight horizontal storage modules contains one dry shielded canister, and each dry shielded canister contains seven fuel assemblies, for a total of 56 irradiated fuel assemblies. Helium is added to each dry shielded canister prior to storage to protect against fuel or cladding oxidation during storage. Heat dissipation is accomplished by natural draft convection where air enters the lower part of the horizontal storage module, rises around the dry shielded canister, and exits through the top shielding slab. The concrete storage modules are connected and share a common foundation. Outer walls of the storage modules are 1.07-m [3.5-ft]-thick concrete to

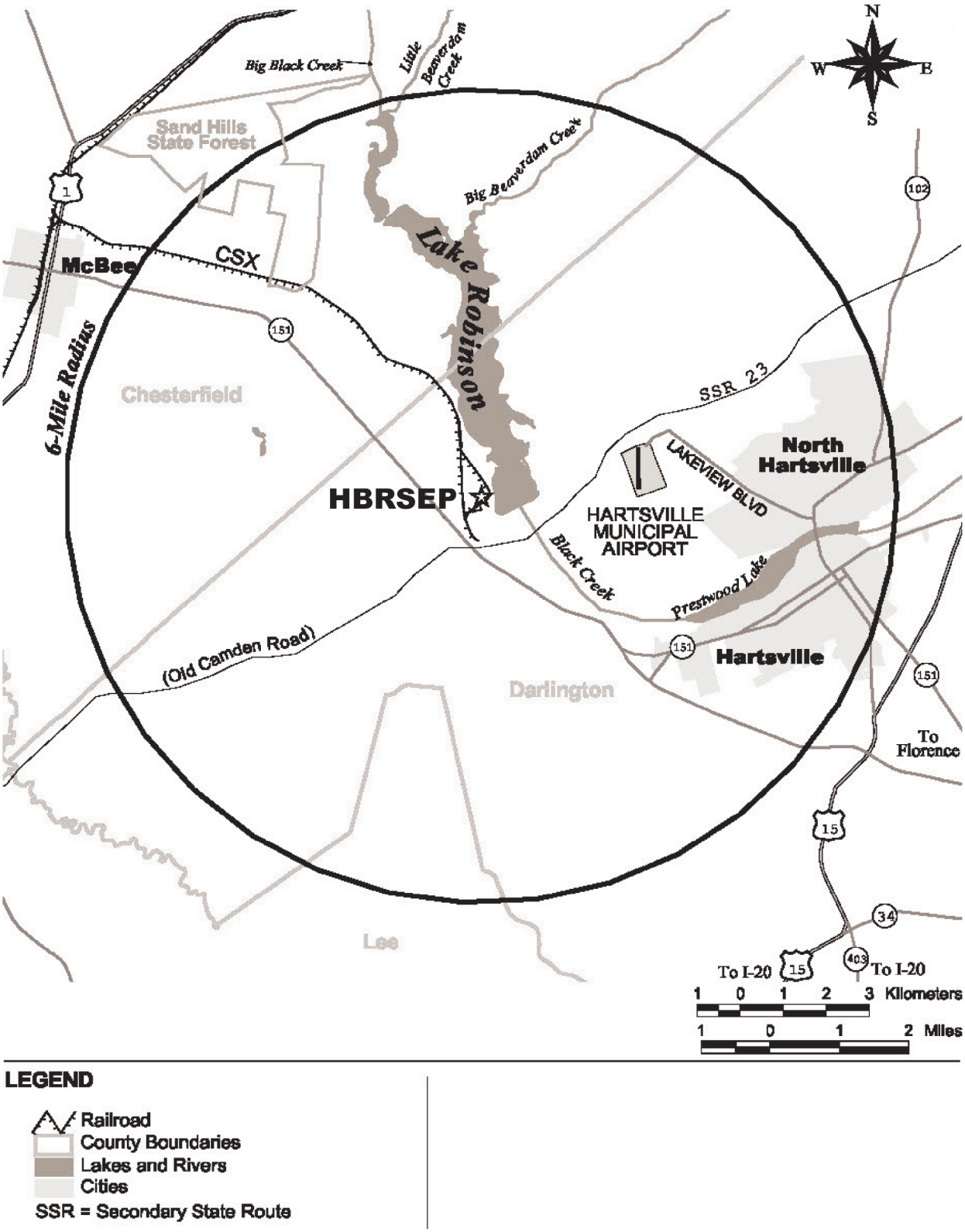

Figure 2-1. 6-Mile Vicinity Map for the HBRSEP (Lucas, 2004d)

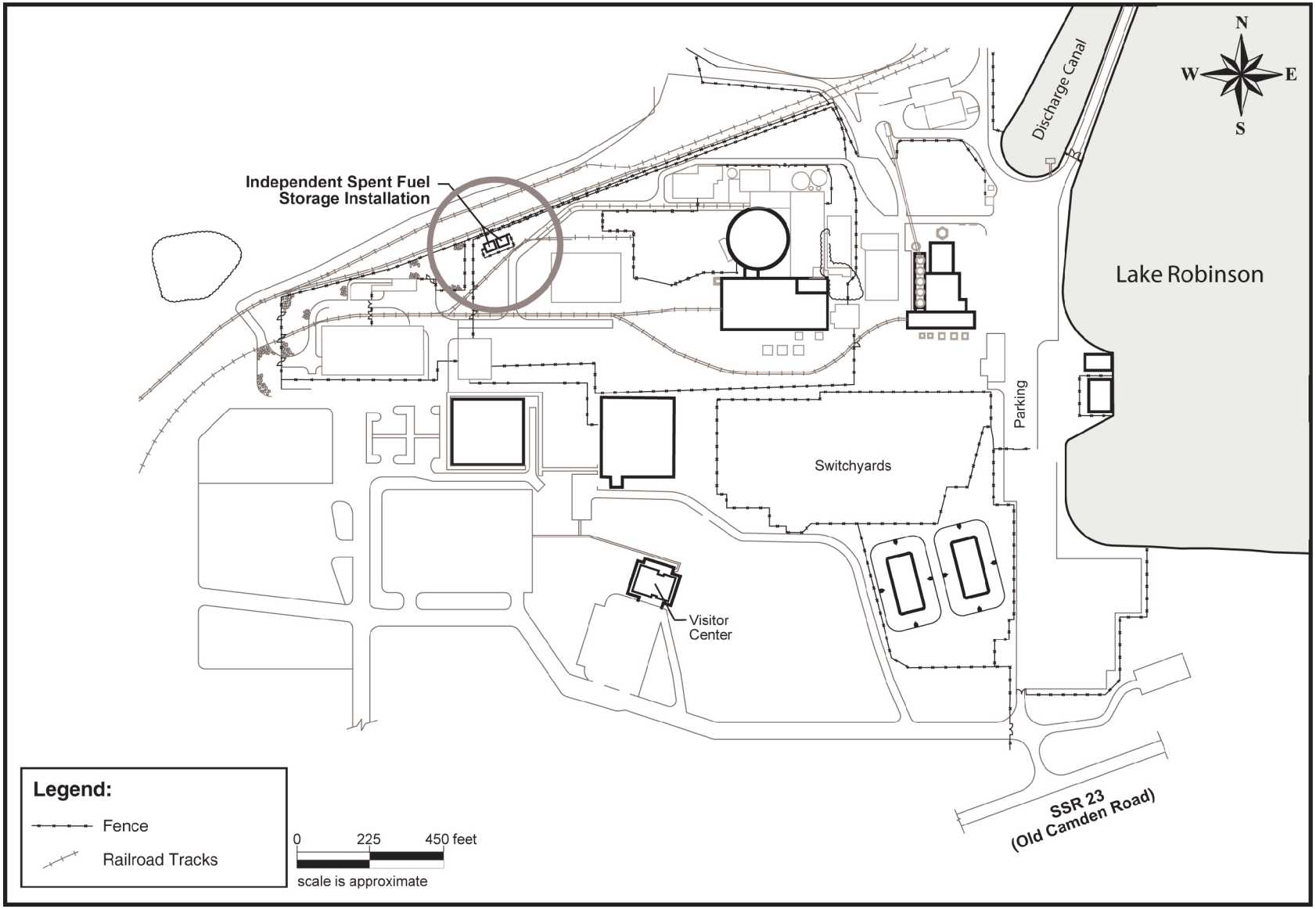

Figure 2-2. Layout of HBRSEP Showing Location of the ISFSI (Lucas, 2004d)

provide the necessary shielding. The facility is designed for an average dose rate on the outside of the storage module of 0.2 mSv/hr [20 mrem/hr] (Lucas, 2004e).

The HBRSEP ISFSI includes a transfer system that was used to move the steel dry shielded canisters from the irradiated fuel pool where irradiated fuel assemblies were loaded into the horizontal storage modules. The transfer system includes a transfer cask, a hydraulic ram, a tow vehicle, trailer, and cask skid. This system interfaces with the irradiated fuel pool, cask crane, and the site layout (e.g., roads and topography) and is controlled by procedural requirements. There have been no operational accidents during the period of HBRSEP ISFSI operation to date (Lucas, 2004d). The HBRSEP ISFSI is filled to capacity, and PEC has no plans to expand the capacity during the renewal period nor remove or exchange the irradiated fuel assemblies until the time of offsite transportation for final disposal at a licensed facility. Since the initial loading of the HBRSEP ISFSI, no unloading or transfers have occurred (Lucas, 2004a).

2.2 Planned Activities

Because the proposed action is a renewal of the existing HBRSEP ISFSI license, planned activities include continued operations and decommissioning.

2.2.1 Continued Operations

Continued operation of the HBRSEP ISFSI in accordance with the proposed action will involve daily inspection of the air inlets and outlets of the storage modules and possible debris removal to maintain air circulation. Operations at the HBRSEP ISFSI will be conducted by existing PEC personnel; therefore, local employment conditions are not expected to change. The HBRSEP ISFSI requires no maintenance during storage, and no construction or expansion is planned according to this proposed action. Additional aging management activities are included in the proposed action to maintain the systems during the proposed 40-year license renewal term.

The purpose of the proposed aging management program is to (i) ensure that no degradation of the horizontal storage modules occurs and (ii) maintain the air inlets and outlets free of obstructions. These proposed activities include visual inspection of accessible concrete and exposed steel as well as radiation monitoring for airborne or surface contamination. Dose rates will be measured annually at predetermined locations about the HBRSEP ISFSI including the module surface, at 1 m [3.3 ft] from the module, outside the radiation control area, and at horizontal storage module drains. Trend analyses of dose rate results can aid the detection of cracks or other problems. Procedures provide criteria for steel and concrete evaluation and acceptance criteria consistent with industry codes, standards, and guidelines (Lucas, 2004a).

A separate aging management program is proposed for the IF–300 transfer cask and pertinent subcomponents. This program involves visual inspections of external surfaces of stainless steel components that experience continuous wetting or intermittent wetting or exposure to outdoor conditions. This program also monitors the transfer cask neutron shield water jacket fluid chemistry to prevent corrosion of exposed surfaces. Corrective action is required when inspection or trend results suggest loss of material could impact component functionality.

2.2.2 Decommissioning

The proposed renewal carries forward the current licensing basis to the renewal period. As such, the decommissioning plans included in the current license would apply to the renewal period. Following removal, transfer, and shipment of the canisters containing the stored irradiated fuel assemblies, contamination of the storage module internals and air passages is expected to be minimal and can be removed by manual methods, thereby allowing disposal of the concrete by conventional methods. The inner steel canister is designed to be used in the repository for final disposal, but if fuel is removed, the canister is expected to be disposed as low-level waste. The actual detailed decommissioning plan will be designed consistent with the applicable regulations at the time of decommissioning and submitted for NRC review and approval.

2.3 Location of the Proposed Action

The HBRSEP is located in northeastern South Carolina, approximately 8 km [5 mi] west-northwest of Hartsville (Figure 2-1). The nearest large city is Columbia, South Carolina, approximately 88 km [55 mi] west-southwest. The HBRSEP is located approximately 50 km [30 mi] south of the North Carolina border and 100 km [90 mi] from the Atlantic Ocean. The HBRSEP site encompasses more than 20 km^2 [5,000 acres] of property in northwestern Darlington and southwestern Chesterfield Counties, including the 9.11-km^2 [2,250-acre] cooling water impoundment, Lake Robinson. The HBRSEP ISFSI is approximately 200 m [600 ft] to the west of the HBRSEP containment structure. The HBRSEP exclusion distance and low population distances are 1,000 m [1,400 ft] and 7.2 km [4.5 mi], respectively, from the containment building. The eastern side of the lake is developed with homes, recreational areas, a marina, and public access points. The area surrounding the site is predominantly rural, consisting of farmlands and woodlands with intermittent industrial sites. Within 10 km [6 mi] of the site are the towns of Darlington, Chesterfield, part of Lee County, and the city of Hartsville.

2.4 Duration of the Proposed Action

The duration of the proposed action is 40 years. The maximum term for an ISFSI is 20 years as required by 10 CFR 72.42; however, as part of the proposed action, PEC is requesting an exemption from this requirement (Section 1.3). Because the proposed action term exceeds the expected operational life of the HBRSEP, an additional renewal for the HBRSEP ISFSI beyond the proposed 40 years is not expected.

3.0 ALTERNATIVES TO THE PROPOSED ACTION

3.1 No Action Alternative

The no action alternative would result in expiration of the current HBRSEP ISFSI license on August 31, 2006. After that time, PEC would not be permitted to store irradiated fuel at the HBRSEP ISFSI and would be required to remove all the fuel stored there. Current storage capacity limitations would require PEC to ship the fuel to an available offsite storage facility or expand existing storage capacity until a disposal facility is licensed to accept spent nuclear fuel. Shipping fuel to another facility is not a common practice, and many facilities are experiencing similar storage constraints. Options for expanding existing storage capacity are currently being

considered by PEC. Transfer of fuel from the existing HBRSEP ISFSI to any other facility would increase worker exposures during transfer operations. Following removal of the spent fuel, the HBRSEP ISFSI would be decommissioned according to the conditions of the license. Because the HBRSEP ISFSI has already been constructed and operated, and other alternative actions being considered would require eventual decommissioning, the associated impacts would be similar.

3.2 Renewal for 20-Year Term

Renewal of the HBRSEP ISFSI license for a term of 20 years, in accordance with the existing regulations in 10 CFR 72.42 would result in the license expiring 4 years prior to the expiration of the proposed HBRSEP operating license. Based on the expected limits on the amount of fuel that can be shipped annually to a potential high-level waste repository and the anticipated schedule for opening such a facility, PEC estimates it would not be able to ship all the fuel before a 20-year license term for the HBRSEP ISFSI expires (Lucas, 2004d). As a result, a third renewal of the HBRSEP ISFSI license would be required, thereby adding cost.

3.3 Alternatives Previously Considered but Not Evaluated in Detail

Several alternatives were considered in the previous analysis for the existing HBRSEP ISFSI license (Lucas, 2004d) but are not evaluated in detail for this environmental assessment based on the arguments presented next. These alternatives include (i) ship the spent fuel to a permanent repository, (ii) ship the spent fuel to the Shearon Harris power plant, (iii) construct a new spent fuel storage pool at the site, and (iv) construct another ISFSI at the site. The alternatives for shipping the spent fuel elsewhere were evaluated by PEC and considered to be unreasonable because a final geologic repository has not yet been licensed or constructed and shipping spent fuel to other power plants is not a common practice. Both options for increasing storage capacity onsite also were considered to be less favorable than the proposed action because building a new spent fuel storage pool is a more costly option than dry cask storage. Either option for expansion of storage capacity would involve additional worker exposures from transferring spent fuel from the existing HBRSEP ISFSI. By comparison, the proposed action of renewing the existing HBRSEP ISFSI license has the advantage of reducing the worker exposure and the cost for storing the fuel at the HBRSEP location.

4.0 AFFECTED ENVIRONMENT

A detailed description of the affected environment is found in the Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants, Supplement 13, Regarding H.B. Robinson Steam Electric Plant, Unit 2 (NUREG–1437) dated December 2003 (NRC, 2003b, Section 2.2). The following paragraphs summarize the affected environment.

4.1 Existing HBRSEP ISFSI Site Description

The HBRSEP ISFSI is located within the HBRSEP protected area, approximately 183 m [600 ft] west of the containment building on the HBRSEP site near Hartsville, South Carolina (Lucas, 2004e, Figure 2-2). The site area is within the Upper Coastal Plain physiographic province of South Carolina, approximately 24 km [15 mi] southeast of the Piedmont Province in an area known as the Sand Hills. The site is on the southern edge of the Sand Hills region and is

typified by rolling hills interspersed with watercourses and covered with wooded areas. To the south and east of the site, the terrain becomes flatter and marshy in the coastal plain (NRC, 2003b).

The HBRSEP ISFSI includes eight storage modules filled to capacity with a total of 56 irradiated fuel assemblies. Two sets of concrete storage modules have connected modules that share common foundations. Each storage module is approximately 5.8 m [19 ft] long, 3.7 m [12 ft] in height, and 2 m [6 ft] wide (Lucas, 2004d). Outer walls of the storage modules are 1.1-m [3.5-ft]-thick concrete to provide the necessary shielding. Additional details of the cask storage system are provided in Section 2.1.

4.2 Land Use

The HBRSEP is located at the southern end of Lake Robinson in an unincorporated portion of Darlington County, South Carolina. This area of the county has no land use zoning. The nearest municipalities include McBee, located approximately 10 km [7 mi] northwest of the HBRSEP, and Hartsville, located approximately 8 km [5 mi] to the southeast. During the last 30 years, Darlington County experienced little population growth. The population increased by 1.7 percent during the 1970s, declined by 0.1 percent in the 1980s, and increased by 0.9 percent during the 1990s (Lucas, 2004d). The majority of the land is rural and is either undeveloped, forested, or involved in agricultural production (Lucas, 2004d).

PEC owns the land around Lake Robinson and leases land to adjacent property owners for access to the lake. Thus, the eastern side of Lake Robinson is developed with homes, recreational areas, a marina, and public access points. PEC also leases the northern portion of its property to the State of South Carolina, which manages the land in conjunction with the adjacent Sand Hills State Forest. PEC manages the balance of the undeveloped property for timber production. The nearest residence to the HBRSEP ISFSI is approximately 411 m [1,350 ft] (Lucas, 2004d).

The entire HBRSEP site occupies approximately 24.4 km^2 [6,020 acres] (NRC, 2003b), however, the HBRSEP ISFSI occupies only a small portion of this land area {610 m^2 [0.15 acre]} (Lucas, 2004d). This land area has been previously disturbed from its natural state (i.e., regraded prior to construction of the HBRSEP ISFSI).

4.3 Demography

The year 2000 census counted 90,408 people within 30 km [20 mi] of the HBRSEP. This count results in a population density of 185 persons per km^2 [71 persons per mi^2] (Lucas, 2004d). The same measure within 80 km [50 mi] of the site includes 809,852 people or 165 people per km^2 [103 people per mi^2]. PEC analyzed local and regional population statistics classified as minority population groups and found American Indian, Alaskan Native, Black, and Hispanic minority populations within an 80-km [50-mi] radius of the site. The analysis also located 61 of 670 census blocks within the 80-km [50-mi] radius that contain low income populations with some populations as near as 10 km [6.0 mi] from the site.

4.4 Climatology and Meteorology

Site climate and meteorologic conditions are documented in the Generic Environmental Impact

Statement for the HBRSEP (NRC, 2003b) and in the HBRSEP ISFSI safety analysis report (Lucas, 2004e). Located in the transition zone delineating the Piedmont and Upper Coastal Plain of South Carolina, the HBRSEP site has a temperate climatic regime. Typically, during the summer, approximately 6 days have temperatures that exceed 38 EC [100 EF]. During the winter, the HBRSEP experiences occasional cold arctic air masses. During these periods, temperatures can fall well below freezing for up to several days, but temperatures rarely fall below !12 EC [10 EF] near the site. The best available long-term extreme temperature data for the region indicate the highest recorded temperature of 42 EC [108 EF] at Columbia, South Carolina, in August 1983, with the lowest reported temperature of !23 EC (!9 EF) at the Raleigh–Durham airport in North Carolina in January 1985.

Rainfalls are generally heaviest during summer thunderstorms, but recent severe weather events involving strong winds and rain were associated with hurricanes Hugo (September 1989) and Hazel (October 1954). The maximum site area 1-minute average wind of 100 km/hr [60 mi/hr] from the west was recorded in March 1954. Based on statistics for the 30 years from 1954 through 1983, on the average, nine tornadoes were estimated to occur in South Carolina during the course of a year. The probability of a tornado striking the site is expected to be about $1 \times 10^{!4}$ per year. Considering more recent data for South Carolina during the period from 1950 to 2004 (National Oceanic and Atmospheric Administration, 2005), staff estimated a statewide average of eight tornadoes per year with wind speeds rated above 120 km/hr [72 mi/hr] (i.e., 448 reported events over 54 years). During this same 54-year period, 11 such tornadoes occurred in Darlington County. All 11 tornadoes had wind speed ratings below 260 km/hr [160 mi/hr] with the exception of one event that was rated up to 331 km/hr [202 mi/hr].

4.5 Hydrology

Groundwater in the area of the site is derived from the Middendorf aquifer (also known as the Tuscaloosa aquifer), a sequence of unconsolidated and semiconsolidated cross-bedded, micaceous, feldspathic quartz sand and gravel beds. In this artesian (confined) aquifer, flow is generally to the southeast. Data indicate that the confined static head of groundwater underlying the site should be approximately 24 m [80 ft] above the Lake Robinson normal level. Leakage from the lake to the Middendorf aquifer is thereby precluded by the upward hydraulic gradient. The Middendorf kaolin layer, which occurs in lenticular bodies that extend laterally for several miles, produces unconfined perched water table conditions where it is present. This near-surface groundwater at the site discharges to Lake Robinson and to Black Creek.

Municipal and industrial sources of potable water within a 32-km [20-mi] radius of the HBRSEP are obtained primarily from groundwater sources in the artesian aquifer. All domestic water usage in the vicinity of the HBRSEP is artesian in origin. Onsite groundwater usage includes five wells completed into the Middendorf Formation that produce an average combined yield of 52 L/s [825 gpm]. This water is used to supply boiler makeup water and sanitary water to Reactor Units 1 and 2. No increases in groundwater usage are expected as a result of continued HBRSEP ISFSI operation during the renewal period.

The main surface water feature at the site is Black Creek, which was impounded in the late 1950s to create Lake Robinson. Lake Robinson is approximately 10 km [7.0 mi] long and varies between 0.4 to 1.2 km [0.25 to 0.75 mi] wide; it has a surface area of 911 km^2 [2,250 acres] and a storage capacity of approximately 38×10^6 m^3 [31,000 acre-ft]. The water level of

Lake Robinson is maintained between 67.3 and 67.5 m [220.7 and 221.5 ft]. The impoundment has a mean depth of 4.39 m [14.4 ft] and a maximum depth (at the dam) of approximately 13 m [44 ft]. Lake Robinson was constructed for the primary purpose of industrial cooling. Secondary uses such as recreation are not restricted by PEC as long as the primary function is not impaired by those activities.

Downstream from Lake Robinson, on the northern edge of Hartsville, is a smaller impoundment of Black Creek called Prestwood Lake, which serves the Sonoco Products Company, located adjacent to the lake.

4.6 Geology and Seismology

The geologic and seismic characteristics of the region around the HBRSEP ISFSI were assessed as part of the original site investigations related to the licensing and constructing the HBRSEP in the late 1960s. These studies are documented in the HBRSEP safety analysis report (CP&L, 2000). No extensive site characterization has taken place since then. The application for renewal of the HBRSEP ISFSI site-specific license refers to CP&L (2000).

The HBRSEP is founded on approximately 140 m [460 ft] of unconsolidated coastal plain sediments of the Middendorf Formation, which overlies Piedmont crystalline basement rock. The Middendorf Formation consists of moderately compacted alluvial sand and gravels in the upper 9 to 15 m [30 to 50 ft] with underlying relatively incompressible sands and firm to hard clayey soils. No structural deformation is apparent in the Middendorf Formation. Analysis of the site prior to its selection for the HBRSEP ISFSI indicated that subsidence was not a problem (CP&L, 2000).

The HBRSEP ISFSI site in South Carolina is not located near an active tectonic margin. Thus, seismicity is characterized by small-magnitude (**M** # 4.0) background earthquakes and very infrequent moderate to large-magnitude intra-continental earthquakes associated with reactivation of ancient geological features. A search of the U.S. Geological Survey catalog (U.S. Geological Survey, 2004) indicated that since January 1, 1974, there have been 54 earthquakes with magnitude greater than or equal to 1.0, within a 200-km [120-mi] radius of the HBRSEP ISFSI site. The largest of these events was a magnitude 4.7 in 1974. None of these recent earthquakes produced significant ground motions at the HBRSEP ISFSI site. The two largest known historical intra-continental earthquakes in North America are the 1811–1812 New Madrid, Missouri, earthquake sequence and the 1886 Charleston, South Carolina, earthquake, both with estimated magnitudes greater than 7.0.

4.7 Ecology

The terrestrial and aquatic ecology in the area of the existing HBRSEP ISFSI has been evaluated numerous times during the history of the site. The most recent environmental evaluations were conducted for the HBRSEP license renewal request and the HBRSEP ISFSI license renewal request (CP&L, 2002; NRC, 2003b; Lucas, 2004a–d). The specific area evaluated by PEC in the environmental report for this proposed action focused on the HBRSEP site that covers more than 200 km^2 [5,000 acres], but included adjacent counties and some offsite areas up to 16 km [10 mi] away. Of the 200 km^2 [5,000 acres], 9.11 km^2 [2,250 acres] are covered by Lake Robinson. Approximately 1 km^2 [243 acres] include disturbed areas such as facilities, laydown areas, parking lots, roads, and maintained grass.

HBRSEP environmental report described the terrestrial resources as follows (CP&L, 2002). The primary terrestrial plant community in the vicinity of the site is the pine-turkey oak-wire grass community typical of the Sand Hills region of South Carolina (Barry, 1980). This community is characterized by longleaf and loblolly pines with a mid-story of oaks, chiefly turkey oak, along with blackjack oak, upland willow oak, and post oak. Most of the upland property west of Lake Robinson and south of Secondary State Route (SSR) 346 {which crosses the lake approximately 2.41 km [1.5 mi] south of the northern shoreline} consists of forest from which timber has been harvested in recent years. After timber is removed, areas are typically replanted with tree species appropriate to the terrain, soils, and drainage characteristics of a site. Harvested areas are usually replanted in loblolly pine, slash pine, or longleaf pine. The property north of SSR 346 is leased to and managed by the South Carolina Department of Natural Resources as a wildlife management area for activities such as public hunting and fishing. Lake Robinson provides some limited marsh habitat in shallow backwaters at the north end of the impoundment. These marshes and adjacent shallows are used by various waterfowl such as the mallard, green-winged teal, wood duck, and Canada goose. Bottomland forest habitat occurs along Black Creek and is characterized by cypress, white cedar, red maple, water oak, red bay, sweet bay, and black willow. Other terrestrial species found at the site are those common to similar habitats in South Carolina and include the opossum, eastern cottontail, gray squirrel, raccoon, white-tailed deer, beaver, river otter, bobwhite quail, blue jay, various warblers, and several reptile and amphibian species.

PEC consulted with the U.S. Fish and Wildlife Service and the South Carolina Department of Natural Resources for the HBRSEP environmental report (CP&L, 2002) and the South Carolina Department of Natural Resources again for HBRSEP ISFSI renewal request (Lucas, 2004d). The bald eagle is the only federally listed terrestrial species known to occur at the HBRSEP site. Other federally listed species with potential habitat at the site include the red-cockaded woodpecker, chaffseed, rough-leaved loosestrife, and Canby's dropwort. None of these species is known to occur at the HBRSEP ISFSI site (NRC, 2003b). Appendix E (Lucas, 2004d) of the HBRSEP ISFSI license renewal application provides a description of these known or potential federally listed species and their habitats. Surveys conducted by and for PEC in the vicinity of the HBRSEP ISFSI site identified no sensitive plant species or botanical resources likely to be impacted by the license renewal.

Aquatic resources in the vicinity of the HBRSEP, primarily associated with Lake Robinson, are discussed in the Generic Environmental Impact Statement for license renewal of the HBRSEP (NRC, 2003b). The lake is not a source of drinking water but does support recreational activities including boating, fishing, and swimming. Lake Robinson and Black Creek are considered typical dystrophic blackwater systems (low mineral content, tannic, acidic, high organic matter content, and unproductive). Elevated copper and zinc have resulted in an "impaired" designation. Elevated mercury content in Black Creek and Lake Robinson has resulted in fish consumption advisories (e.g., restrictions) for selected species. Fish include a variety of minnows, suckers, catfish, sunfish, and perch (NRC, 2003b). The bluegill population expanded rapidly following HBRSEP replacement of brass condenser pipes with stainless steel, thereby reducing the copper concentrations in the lake. Eleven state and federally protected aquatic species were previously identified as having potential to occur in the region surrounding the site. Of these 11 species, none has been identified in surveys from 1974 to 1998 on or near the HBRSEP site (NRC, 2003b). Recent NRC consultations with the U.S. Fish and Wildlife Service and the South Carolina Department of Natural Resources regarding

endangered species and critical habitats are discussed in Section 7.1 and 7.3. No new species or habitats were identified in these consultations.

4.8 Transportation

Principal transportation routes or facilities include highways, a railroad line {488 m [1,600 ft] to the west}, and a small airport {4 km [2.5 mi] to the east} (Lucas, 2004e). The airport runway serves only small aircraft. A highway running north and south (SC 151) is located 0.8 km [0.5 mi] to the west of the site. Numerous state-maintained secondary roads exist near the site.

Access to the HBRSEP is by Old Camden Road (SSR 23), a two-lane paved road that intersects SC 151 approximately 0.8 km [0.5 mi] west of the site. SC 151 has a northwest-southeast orientation and is used by employees traveling from the Hartsville and Darlington rural areas south of the site and Chesterfield County employees north of the site. Employees from Lee County to the southwest travel east on SC 34 or Interstate 20 to intersect SC 403 and US Highway 15 North, a tributary to SC 151. Residents of Florence County travel directly to SC 151 via US Highway 52 West or travel on Interstate 20 West to SC 403 and US Highway 15 North. Traffic count data for these roads is provided in Table 4-1 (CP&L, 2002). The State of South Carolina has not found it necessary to calculate level of service designations in any of the listed roads.

4.9 Regional Historic, Scenic, Cultural, and Natural Features

The region surrounding the HBRSEP was previously inhabited by various Native American tribes during Prehistoric and Protohistoric (10,000 B.C. to A.D. 1675) and Historic (A.D. 1675 to the end of the 18th century) periods. Settlement of the area was stable, evolving from a dependence on big game hunting in the earlier period to a village lifestyle with a reliance on cultivated crops and intergroup trading during the latter periods. At the time of initial European contact (early 16th century), the Pee Dee, Wateree, and the Cheraw Tribes were the most settled of the area.

During the Native American Historic Period (16th–18th centuries), contact between the Native American inhabitants and European explorers and settlers occurred, bringing a period of inter-tribe and colonist conflicts, as well as major cultural changes. Some of the tribes

Table 4-1. Traffic Counts for Roads in the Vicinity of the HBRSEP ISFSI

Route Number	Vicinity of	Estimated Annual Average Daily Traffic Volume
SSR 23	SC 102	2,100
SC 151	US Highway 15	11,000
SC 151	SC 34	17,300
Alternate SC 151	SC 151	8,200
US Highway 52	Florence County Line to SC 151	21,300

Source: Carolina Power and Light (CP&L) . "Applicant's Environmental Report—Operating License Renewal Stage, H.B. Robinson Steam Electric Plant, Unit No. 2." Hartsville, South Carolina: CP&L. 2002.

regrouped to form other tribes, and many migrated to various regions within South Carolina, while some headed north into North Carolina.

European settlement of the area brought widespread agricultural cultivation and development of farmsteads, towns, and cities that provided the foundation of what currently exists in the area. Farming and other agricultural-based endeavors dominated the land use and economic growth of the area. In the late 19th and early 20th centuries, rail lines were installed through the area to Hartsville. These rail lines spurred the development of nonagricultural-based industries in the region.

Outside of the boundaries of the HBRSEP, within Darlington, Chesterfield, and Lee Counties, several cultural resources are listed, or eligible for listing, on the National Register of Historic Places. Many of the sites are related to the agricultural development of the area. Within the HBRSEP, no historic properties are listed on the National Register, although a site near the visitor center is eligible for listing. Because the HBRSEP is located on former Native American lands and later Euro-settled agricultural properties, there is a possibility that archeological sites related to these settlement periods are located within the area. A comprehensive archaeological survey of the land within the HBRSEP boundaries has not been conducted, although NRC staff consultations with the South Carolina State Historic Preservation Officer and eight Native American Tribes/groups have occurred and are documented in NRC (2003b) and Section 7.0 of this environmental assessment. Based on the extent of the ground disturbance at the HBRSEP ISFSI site, it is presumed that the site and surrounding environs do not contain any known or unknown cultural resources. The existence of any archaeological resources at this site is highly unlikely.

4.10 Background Radiological Characteristics

The radiological characteristics of the HBRSEP have been evaluated as part of a radiological environmental monitoring program since 1973 and more than 30 years of environmental data have been collected in the area surrounding the site. Monitoring results are compiled into annual radioactive effluent release reports. The radiological environmental monitoring program includes monitoring of the air, direct radiation, surface water, drinking water, groundwater, shoreline sediment, aquatic vegetation, bottom sediment, milk, fish, broadleaf vegetation, and food products within approximately 16-km [10-mi] radius of the HBRSEP.

Operation of the HBRSEP results in a very small increase in radioactivity in the air and water. For example, the total effective dose equivalent from liquid effluent-based estimates was reported in 2002 to be $7.04 \times 10^{!6}$ mSv [$7.04 \times 10^{!4}$ mrem]. The dose from airborne noble gases in effluents was estimated at $2.38 \times 10^{!3}$ mrad [$2.38 \times 10^{!2}$ Gy] beta and $4.94 \times 10^{!3}$ mrad ($4.94 \times 10^{!2}$ Gy) gamma (NRC, 2003b; CP&L, 2002).

Based on calculations, the maximally exposed member of the public receives approximately 0.043 mSv [4.3 mrem] per year from HBRSEP ISFSI operations (Lucas, 2004d). This dose estimate results from external radiation only, because no gaseous, particulate, or liquid effluents are associated with the normal operation of the HBRSEP ISFSI.

The typical average annual total effective dose equivalent to a person living anywhere in the United States from background sources of radiation is approximately 3 mSv [300 mrem]. This dose is from exposure to cosmic radiation, cosmogenic radionuclides, terrestrial radionuclides,

inhaled radionuclides, and radionuclides naturally occurring in the body. In comparison to the national average, radiological monitoring data indicate that the actual annual exposure contribution from the HBRSEP ISFSI, along with the total of all other uranium fuel cycle activities, is a small fraction of the national average from all sources.

5.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

5.1 Radiological Impacts

5.1.1 Normal Operations

Radiation exposure from normal HBRSEP ISFSI operations is primarily a result of direct and scattered radiation from the spent fuel in the storage modules. PEC maintains a radiation protection program for the HBRSEP in accordance with 10 CFR Part 20 to ensure that radiation doses are maintained as low as is reasonably achievable. This radiation protection program is applicable to HBRSEP ISFSI operations. During the storage phase, radiological impacts to workers will result from routine activities, such as performing radiation surveys, preventive and corrective maintenance, surveillance activities, and routine security patrols. Such activities will be conducted by the existing workforce at the HBRSEP. An annual worker dose estimate of 0.1 mSv/yr [10 mrem/yr] for storage activities based on an individual standing at the HBRSEP ISFSI fence for 8 hours per day, 250 days per year, is included in the environmental report supplement (Lucas, 2004d). An estimated worker dose of 15.6 mSv [1.56 rem] per year was calculated for daily visual inspection activities (Lucas, 2004e). Both dose estimates are below the NRC annual 0.05-Sv [5-rem] worker dose limit in 10 CFR 20.1201. While these worker dose estimates are based on calculated dose rates from the HBRSEP ISFSI storage modules, PEC operational radiation survey data (Lucas, 2005) verify actual surface dose rates are less than the estimated values {e.g., gamma and neutron scans are <0.02 mSv/hr [<2 mrem/hr]}; therefore, the reported worker dose estimates are expected to overestimate actual exposures.

The HBRSEP ISFSI is presently loaded to capacity and the renewal request does not involve any additional construction or inventory. Therefore, fuel transfer and loading operations are not anticipated to contribute radiological impacts to workers other than those associated with final retrieval of stored fuel for offsite transport to a licensed disposal facility and decommissioning. PEC estimates the worker dose associated with final retrieval would not exceed prior estimates for loading the HBRSEP ISFSI {0.022 person-Sv [2.2 person-rem] total} (Lucas, 2004d).

The storage of spent fuel in modules at the HBRSEP ISFSI is expected to result in very small radiation doses to the offsite population. No gaseous, particulate, or liquid effluents are associated with the normal operation of the HBRSEP ISFSI. The closest site boundary is 250 m [830 ft] from the HBRSEP ISFSI, and the nearest resident is 411 m [1,350 ft] away. In its HBRSEP ISFSI license renewal environmental report supplement (Lucas, 2004d), PEC provided the results of offsite dose calculations. These calculations estimated direct and scattered radiation from the spent fuel in the HBRSEP ISFSI dry shielded canisters and horizontal storage modules. The calculated annual dose to the maximally exposed member of the public from HBRSEP ISFSI operations is 0.043 mSv [4.3 mrem], which is below the annual limits specified by NRC in 10 CFR 72.104(a) and 10 CFR 20.1301(a), of 0.25 mSv [25 mrem] and 1 mSv [100 mrem], respectively (Lucas, 2004d). The cumulative offsite dose to the maximally exposed resident from all site activities, including the HBRSEP ISFSI, is calculated to be less than 0.05 mSv [5 mrem] per year, which is less than the limit referenced in

10 CFR 20.1301 (NRC, 2003b; CP&L, 2002). Based on these results, normal HBRSEP ISFSI operations will not have a significant offsite radiological impact.

Radiological effects on wildlife are also expected to be very small. The bald eagle is the only state or federally listed threatened or endangered species present in the vicinity of the HBRSEP ISFSI, sighted near Lake Robinson. The immediate area has a low habitat value because of its significant development and use. The HBRSEP ISFSI security fences and ongoing industrial activities associated with HBRSEP operations keep most species far enough from the storage casks that the resulting radiation doses should pose no threat to wildlife. However, some birds and small wildlife may intrude into the storage module area. Based on reports of the International Atomic Energy Agency, radiation doses below approximately 1 Sv [100 rem] per year do not appear to have a significant effect on birds or small mammals. This dose would not be exceeded even if an animal were to remain in almost constant contact with a storage module because the total surface dose rate for the wall or roof is 0.025 mSv [2.5 mrem] per hour (Lucas, 2004d). In addition, the periodic required inspections of the casks by PEC personnel would discourage wildlife from remaining in the area. Therefore, very few, if any, animals are expected to receive significant radiation exposure as a result of HBRSEP ISFSI operation, and the overall impact on wildlife will be very small.

Operational radiological impacts from the no action alternative would increase in relation to the proposed action. No action would allow the current license to expire, requiring transfer of the stored spent fuel from the HBRSEP ISFSI to another licensed facility that would store the spent fuel until transfer to a licensed high-level waste repository is possible. While transfer to another licensed storage facility would shift future operational worker exposures from HBRSEP staff to another set of workers at the receiving facility, the net worker exposures would increase because of the extra transfer handling required to store the spent fuel at another facility prior to final disposal. Additional public radiation exposures from transportation of fuel to an interim storage facility would also occur if the no action alternative was implemented. For the 20-year renewal alternative, operational radiological impacts would be the same because the transfer of the spent fuel to a repository for final disposal is the same under either option (e.g., requiring another license renewal to accommodate the final disposal schedule). Detailed scheduling for final disposal is affected by current uncertainties in licensing a final disposal facility.

5.1.2 Accidents

A detailed safety review, including consideration of potential accident scenarios and consequences, is documented by NRC in the safety evaluation report. The following discussion summarizes the potential accidents considered in the design of the HBRSEP ISFSI, along with the potential likelihood and estimated consequences of such events. During the past 20-year period of HBRSEP ISFSI operation, there have been no operational accidents (Lucas, 2004d).

In the supplemental environmental report for the HBRSEP ISFSI renewal (Lucas, 2004d), PEC addresses four categories of design events as defined in ANSI/ANS–57.9 (American National Standards Institute/American Nuclear Society, 1992), which include normal, off-normal, and accident events. Design Event I represents an event associated with normal operations, such as the normal ambient temperature range; the impacts from such events are similar to impacts caused by normal operations. Design Event II represents an event associated with off-normal operations that can be expected to occur with moderate frequency (on the order of once a

year). Design Event III represents an infrequent event that could be reasonably expected to occur during the lifetime of the facility. Design Event IV represents an extremely unlikely event that is postulated to occur because it establishes a conservative design basis for systems, structures, and components important to safety. Design events are addressed in Chapter 8 of the HBRSEP ISFSI safety analysis report (Lucas, 2004e).

Design Event II events are off-normal events that could potentially result in members of the general public being exposed to additional levels of radiation beyond those associated with normal operations. The types of events in this category include off-normal ambient temperatures, off-normal pressures internal to the dry storage canister, misalignment of the dry storage canister with respect to the Horizontal Storage Module, and partial blockage of storage cask air ducts. There are no radiological consequences from internal pressure load and off-normal ambient temperatures. Design of the dry storage canister bounds the operating internal pressure and extreme range of ambient temperatures at the site. Similarly, there are no radiological consequences from misaligned dry storage canisters. Misalignment of the dry storage canister would cause jamming of the canister casing. Analysis of the NUHOMS® topical report (Lucas, 2004e) shows there are no radiological consequences. The partial blockage of storage cask air ducts is the only event in this category that has the potential to result in a slight increase in radiological consequences. Partial blockage of the air ducts would be less severe than total blockage of all air ducts, which has been addressed in the Accidents section of the HBRSEP ISFSI safety analysis report (Lucas, 2004e). There is no threat to the public health and safety as this event would not result in any measurable increase in dose at the site boundary. The blockage would be detected during regular inspection and cleared in less than 48 hours. The partial blockage of storage cask air ducts could result in small additional doses to workers because of the actions necessary to remove the blockage. The dose received by the workers would also be controlled in accordance with the occupational dose rate limits specified in 10 CFR Part 20, Subpart C.

Design Events III and IV include more severe events such as earthquakes, tornadoes, and tornado-generated missiles, fire, leakage of the dry storage canister, drop, loss of shielding at air inlet, total blockage of air inlet ducts, lightning, and train derailment. For information supporting design bases susceptible to changes with time (e.g., seismic and tornado event frequency and magnitude), staff compared original design bases with current information. Seismic hazards at the site are discussed in Appendix 2.5D of the HBRSEP safety analysis report (CP&L, 2000), which concluded that structures designed to withstand 0.2g peak ground acceleration (PGA) with no loss of function have an ample margin of safety. This assessment was based on the documented Modified Mercalli intensity of VII at Hartsville, South Carolina, recorded after the 1886 Charleston, South Carolina, earthquake. The site-specific earthquake design motion at 0.20g PGA appears to be consistent with recent probabilistic seismic hazard results as interpolated from probabilistic seismic hazard maps developed by the U.S. Geological Survey as part of the U.S. Geological Survey National Seismic Hazard Mapping Project (U.S. Geological Survey, 2002). Regarding potential impacts from tornadoes, the HBRSEP ISFSI is designed to withstand tornado wind speeds up to 580 km/hr [360 mi/hr] (Lucas, 2004e). Historical tornado data (Section 4.4) indicate local and regional tornadoes have all been well below this design basis wind speed. Of the Design Events III and IV considered, the complete blockage of air inlet ducts, dry storage canister leakage, and loss of shielding are events that could increase worker radiation exposures (Lucas, 2004e). The calculated dose rate at the controlled area boundary fence line from each of these events is much less than the 0.05-Sv [5-rem] limit specified for accidents in 10 CFR 72.106(b). For example, Lucas (2004e)

estimates a loss of shielding would require 30 minutes to correct with a corresponding worker dose of 0.70 mSv (70 mrem). Although the HBRSEP ISFSI is near an onsite rail track, the potential for impacts from train derailment is considered not credible because of the speed limits {8 km/h [5 mi/hr]} and porous soil conditions that would stop a derailed train before the train travels the distance necessary to impact the facility. Finally, the likelihood of a damaging aircraft impact from the nearby Hartsville (private) airport, while not included as a design event for the HBRSEP ISFSI, was previously assessed by staff for HBRSEP and found to be insignificant (King, 2000).

Potential accident impacts from the no action alternative are expected to increase because expiration of the existing license would require an additional spent fuel transfer and transportation operation prior to final disposal. The 20-year renewal alternative is expected to pose similar accident risks as the proposed action, provided the schedule for transfer of the fuel to a repository for final disposal is the same under either option (e.g., requiring another license renewal to accommodate the final disposal schedule). Detailed scheduling for final disposal is affected by current uncertainties in licensing a final disposal facility.

5.2 Nonradiological Impacts

Nonradiological environmental impacts are expected to be minimal because the proposed action requests renewal of the HBRSEP ISFSI license, and the facility has already been constructed and operated safely for the past 20 years. No additional construction or land use is included in the proposed action, and the HBRSEP ISFSI is loaded to capacity with spent fuel. If the license renewal is approved, there are no plans to exchange or transfer fuel prior to transfer and shipment of stored fuel to a final offsite disposal facility. The facility is designed as a passive system that requires no power or regular maintenance other than routine visual inspections and checks of the passive ventilation ducts for blockages. Operations at the HBRSEP ISFSI will be conducted by existing PEC personnel and, therefore, are not expected to change local employment conditions. The HBRSEP ISFSI produces no effluents, does not generate noise, and does not produce any climate or socioeconomic impacts. As a result, no notable changes to the human or natural environment surrounding the HBRSEP ISFSI are expected from the proposed license renewal or alternative.

The HBRSEP ISFSI is located approximately 427 m [1,400 ft] from the shore of Lake Robinson at a grade elevation of 71.6 m [235 ft]. Flooding is not expected because the facility grade is sufficiently higher than the maximum lake level of 67.7 [222 ft] that can be maintained by the dam and ancillary structures. The dams for both Lake Robinson and Prestwood Lake are downstream of the HBRSEP ISFSI; therefore, a dam failure would not flood the site. Because the HBRSEP ISFSI requires no water from the lakes for operation, a potential dam failure would not affect operation of the facility.

PEC evaluated groundwater movement for an area of investigation that included the HBRSEP, the ash disposal pond, and the area in between (Lucas, 2004e). The shortest route of groundwater travel from the ash pond to the lake is 122 m [400 ft]. The estimated time required for groundwater to travel this distance is approximately 45 days. For a longer, circuitous route of 1,080 m [3,550 ft] from the ash pond to the discharge canal, the groundwater travel time is approximately 10 years. The HBRSEP ISFSI, however, stores spent fuel in a dry condition and does not use any liquids for operation or produce any effluents. Therefore, the groundwater system will not be affected by normal operation of the HBRSEP ISFSI. Additionally, potential

effects of the site on local sources of municipal, industrial, or domestic groundwater sources are precluded by the substantial upward hydraulic gradient between the Middendorf aquifer and local surface or near-surface bodies of water.

A review of surface topography indicates that the HBRSEP ISFSI does not significantly affect any natural drainage features. The HBRSEP ISFSI facility is located upstream of the Lake Robinson dam at a grade that is sufficiently above maximum lake levels. Therefore, potential flooding of the facility from local surface water features is not a concern.

5.3 Impacts of Decommissioning

Decommissioning plans for the HBRSEP ISFSI are general in nature because these activities are expected to occur following discontinuation of storage decades into the future. Before any decommissioning activities begin, a detailed decommissioning plan will be submitted to NRC for review and approval. Because the HBRSEP ISFSI has already been constructed and filled to capacity with irradiated fuel assemblies, the need for and associated impacts of decommissioning are similar for the proposed action and the 20-year alternative. Any alternative requiring transfer of the spent fuel to another facility prior to disposal, such as the no action alternative, could increase decommissioning impacts.

The dry storage canisters are intended to be transferred to a federal repository, when such a facility is operational. The NUHOMS® modules are designed to allow return of the dry storage canisters to shipping casks for offsite transportation and disposal in accordance with the applicable regulations at the time. Contamination of the storage modules is expected to be minimal and may be removed by manual methods, thereby allowing breakup and disposal of the modules using conventional methods.

Following review of the general decommissioning plans for the HBRSEP ISFSI, the NRC staff concludes decommissioning is feasible with minimal environmental impacts. No changes to the existing decommissioning approach were proposed; therefore, no impacts beyond those considered in the initial licensing action are expected.

5.4 Cumulative Impacts

The NRC staff has evaluated whether cumulative environmental effects could result from the incremental impacts of the license renewal for the HBRSEP ISFSI when added to relevant past, present, or reasonably foreseeable future actions in the area. The relevant other actions include the past, current, and future operation of the HBRSEP (under a renewed license), and the reasonably foreseeable construction and operation of a new ISFSI at the HBRSEP. No incremental impacts of the existing HBRSEP ISFSI were identified for three resources (geology or soils, hydrology, and air quality), two ecosystems (aquatic resources and threatened or endangered species), and five human communities issues (socioeconomics, social services or public utilities, land use, historic or cultural resources, and radiation doses to the public from accidents). Small cumulative effects from the three actions were identified for occupational doses from normal operations, other occupational health effects, radiation doses to the public from normal operations, and occupational radiation doses from accidents. However, these cumulative effects are small and would not exceed permissible levels within the NRC regulations. Further, routine maintenance activities and adherence to both general safety and radiation safety regulations will aid in minimizing these cumulative effects.

6.0 MONITORING

Daily visual inspections would continue to be conducted of the horizontal storage modules of the HBRSEP ISFSI to ensure the air inlets and outlets remain unblocked and the integrity of screens remains intact. Any blockages would be removed, and damaged screens would be replaced and passages checked for obstructions (Lucas, 2004e). The HBRSEP ISFSI is a passive system that requires no instrumentation for monitoring.

The HBRSEP maintains a site-wide radiological monitoring program in which results are reported on an annual basis. The radiological environmental monitoring program includes monitoring of the air, direct radiation, surface water, drinking water, groundwater, shoreline sediment, aquatic vegetation, bottom sediment, milk, fish, broadleaf vegetation, and food products within a 16-km [10-mi] radius of the site. Continuation of the existing monitoring programs is expected to be sufficient for maintaining environmental, public, and worker safety during the proposed period of operations.

7.0 AGENCIES AND PERSONS CONSULTED

In accordance with NUREG–1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs (NRC, 2003a), the NRC staff consulted with other agencies regarding the proposed action. These consultations are intended to afford the designated state liaison agency the opportunity to comment on the proposed action and to ensure that the requirements of Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act are met with respect to the proposed action.

7.1 U.S. Fish and Wildlife Service

By letter dated October 20, 2004, the NRC staff requested that the U.S. Fish and Wildlife Service provide an official species list for the project area. On November 2, 2004, the U.S. Fish and Wildlife Service transmitted that official species list. The NRC staff confirmed that PEC considered in its HBRSEP ISFSI license renewal request (Lucas, 2004d) those threatened and endangered species identified by the U.S. Fish and Wildlife Service in the species list, and that the proposed action would not impact those species.

7.2 South Carolina State Historic Preservation Officer

By letter dated November 26, 2004, the NRC staff requested the views of the State Historic Preservation Officer regarding identification of historic properties that may be affected by the proposed action. On December 21, 2004, a representative of the State Historic Preservation Office transmitted a response letter that referred to ongoing consultations between the State Historic Preservation Office and PEC regarding the development of a guidance document for the preservation of historic, cultural, and archeological resources at the HBRSEP. Based on those consultations, and the understanding that the guidance document for HBRSEP is expected to be applied to the HBRSEP ISFSI site, the State Historic Preservation Office concluded that an additional consultation regarding the HBRSEP ISFSI renewal was not necessary.

7.3 South Carolina Department of Natural Resources

By letter dated November 24, 2004, the NRC staff requested information regarding endangered species and critical habitats for the HBRSEP ISFSI site. Specifically, the NRC staff requested whether the department had any changes to the species list included in the HBRSEP ISFSI renewal request (Lucas, 2004d). On October 6, 2004, staff received a phone call from the department indicating they had no changes to the species list.

8.0 CONCLUSION

The NRC staff concludes that the proposed renewal of the HBRSEP ISFSI involving continued operation and decommissioning of that facility will not result in a significant impact to the environment. Because the facility has already been constructed and loaded to capacity with spent fuel, no further land use, construction, or spent fuel loading impacts are expected with the proposed license renewal. Designed as a passive facility that produces no liquid or gaseous effluents and requiring no power or regular maintenance, no significant radiological or nonradiological impacts from continued normal operations are expected. Occupational dose estimates from routine monitoring activities and final transfer of stored fuel for disposal provide confidence the radiation protection program will maintain worker doses within the limits of 10 CFR 20.1201. Public dose estimates for all HBRSEP activities (including the HBRSEP ISFSI) will not exceed 0.05 mSv/yr [5 mrem/yr], a value within the NRC public dose limits in 10 CFR 20.1301. The impacts from decommissioning the HBRSEP ISFSI are expected to be small, and the proposed license extension and resulting radioactive decay would reduce radiological impacts for some radionuclides in the stored spent fuel. While some minority populations were reported to reside in the vicinity of the site, an environmental justice review is not necessary because the proposed action will not result in a significant impact to the environment and there is no clear potential for offsite impacts to minority and low-income communities.

The environmental impacts of the proposed action have been reviewed in accordance with the requirements of 10 CFR Part 51. The NRC staff has determined that the storage of spent nuclear fuel at the HBRSEP ISFSI will not significantly affect the quality of the human environment. Therefore, an environmental impact statement is not warranted for the proposed action, and pursuant to 10 CFR 51.31, a finding of no significant impact is appropriate.

The documents related to this proposed action are available for public inspection and copying at the NRC Public Document Room, One White Flint North, 11555 Rockville Pike, Rockville, Maryland, 20852. Additionally, most of these documents are available for public review through the NRC electronic reading room at http://www.nrc.gov/reading-rm.html.

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