PSEG Site

Early Site Permit Application

Part 1

Administrative Information

Revision 3

PSEG Site
ESP Application
Part 1, Administrative Information

MASTER TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Number	Title

None

ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
COL	combined license
EIS	Environmental Impact Statement
EP	Emergency Plan
ER	Environmental Report
ESP	early site permit
FFD	fitness for duty
HCGS	Hope Creek Generating Station
ITAAC	inspections, tests, analyses, and acceptance criteria
LWA	limited work authorization
NEPA	National Environmental Policy Act
NJ	New Jersey
NRC	U.S. Nuclear Regulatory Commission
PPE	plant parameter envelope
QAP	Quality Assurance Program
SER	Safety Evaluation Report
SGS	Salem Generating Station
SSAR	Site Safety Analysis Report
SUNSI	Sensitive Unclassified Non-Safeguards Information

CHAPTER 1

INTRODUCTION

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

PSEG Power, LLC and PSEG Nuclear, LLC submit this application for an early site permit (ESP) to the U.S. Nuclear Regulatory Commission (NRC) in accordance with the requirements of Title 10 of the Code of Federal Regulations, Part 52, (10 CFR 52) Subpart A, *Early Site Permits*. PSEG Power, LLC and PSEG Nuclear, LLC are the Applicants for this ESP and are hereafter referred to as PSEG or Applicants. The Applicants request that the NRC issue an ESP for the PSEG Site described in this application for a period of 20 years from the date of issuance. The information in this application has been developed to support the issuance of that permit.

The Applicants selected a site located on the southern part of Artificial Island on the east bank of the Delaware River in Lower Alloways Creek Township, Salem County, New Jersey (NJ). The PSEG Site is 15 miles south of the Delaware Memorial Bridge, 18 miles south of Wilmington, Delaware (DE), 30 miles southwest of Philadelphia, Pennsylvania (PA), and 7-1/2 miles southwest of Salem, NJ. Other existing nuclear facilities licensed by the NRC are located at this site. The other facilities are Salem Generating Station (SGS) Units 1 and 2 and Hope Creek Generating Station (HCGS) Unit 1. Part 2, Chapter 1 of this ESP application provides a more detailed description of the PSEG Site.

The specific reactor type has not been selected. Technical information from various reactor designs is used to develop bounding parameters that are intended to envelop the proposed facility characterization necessary to evaluate the suitability of the site for future construction and operation of a nuclear power plant.

Locating proposed additional nuclear units on an existing nuclear plant site is beneficial because this existing site already has an infrastructure in-place to support nuclear power generation. Other key advantages of locating additional nuclear units at the PSEG Site are as follows:

- Existing SGS and HCGS site-related analysis, environmental, and operating records are available as inputs for development of various sections of this ESP application (ESPA).

- The PSEG Site and associated exclusion area, through licensing efforts associated with SGS and HCGS, previously underwent screening and evaluation processes, which established the site's suitability. The screening and evaluation process included an evaluation of alternatives consistent with the National Environmental Policy Act (NEPA) and NUREG 1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan,* requirements.

- Programs, procedures, and arrangements are established, and in-place, with federal, state, and local government agencies, covering emergency planning, permits and authorizations, etc., for the existing plants. Similar programs, procedures, permits and authorizations are required for the new plant.

- Liaisons with the local community are already established.

Of the existing facilities, SGS is 57.41 percent owned by PSEG Nuclear, LLC and 42.59 percent by Exelon Generation LLC, and HCGS is solely owned by PSEG Nuclear, LLC. PSEG Nuclear, LLC is the licensed operator of SGS and HCGS at the PSEG Site, with complete authority to regulate any and all access and activity within the plant exclusion area boundary, and authority to act as the agent of the site owners.

1.2 PURPOSE OF EARLY SITE PERMIT APPLICATION

Obtaining a license for a nuclear power plant in the United States has historically been a two-step process as set forth in 10 CFR 50. Domestic licensing of production and utilization facilities requires the NRC to first issue a construction permit, and later, an operating license. In 1989, the NRC established an alternative licensing process, in 10 CFR Part 52, which combines the construction permit and operating license, with certain conditions, into a single combined license (COL). Other licensing provisions of 10 CFR 52 include the ESP, which allows an applicant to obtain approval for a site for a nuclear power plant, prior to a decision to construct, and "bank" it for future use, and the certified standard plant design, which can be used by an applicant as a power plant design pre-approved by the NRC.

As envisioned, the ESP process is meant to resolve key site suitability issues well in advance of when a decision is made to build a nuclear power facility. For example, site suitability with regards to 10 CFR 50.34(a)(1) and 10 CFR 100 and environmental impacts are resolved as part of the ESP process. Any impediments to implementing an emergency plan are identified and resolved early in the licensing process.

Moreover, Part 52 recognizes that it is possible to obtain approval of the site for future nuclear power plants as a separate matter from, and well in advance of, decisions on what and when to build. In those instances where the ESP applicant has not selected a particular reactor technology, ESPAs may use the plant parameter envelope (PPE) approach as a surrogate for actual facility information to support required safety and environmental reviews. Under the PPE approach, ESPAs do not reference any specific reactor technology and the resulting ESP is applicable for a range of reactor designs.

Under 10 CFR 52, an ESP can be issued separate from any other NRC licensing action. Such permits are valid for a period of ten to twenty years with provisions for renewal for an additional ten to twenty years. ESP licensing issues are resolved with finality during the ESP review process and are not re-examined in any subsequent licensing action involving the permitted site, absent any information meeting certain standards established by the NRC.

1.3 CONTACT INFORMATION

Any notices, questions, or correspondence in connection with this filing should be directed to:

Mr. J. Mallon
Early Site Permit Manager
PSEG Power, LLC
244 Chestnut Street
Salem, NJ 08079

with copies to:

Mr. R. C. Braun
Senior Vice President and Chief Operating Officer
PSEG Nuclear, LLC
One Alloway Creek Neck Rd.
Hancock's Bridge, NJ 08038

CHAPTER 2

EARLY SITE PERMIT APPLICATION FORMAT AND CONTENT

TABLE OF CONTENTS

CHAPTER 2

EARLY SITE PERMIT APPLICATION FORMAT AND CONTENT

2.1 FORMAT AND CONTENT

This application contains the information required by 10 CFR 52.17, *Contents of applications; technical information*, for an early site permit application (ESPA). The application is submitted to the U.S. Nuclear Regulatory Commission (NRC) in accordance with NRC guidance on electronic submittals.

The application is organized, in accordance with 10 CFR 52.17, in the following manner: Part 1, Administrative Information; Part 2, Site Safety Analysis Report (SSAR); Part 3, Environmental Report (ER); Part 4, Site Redress Plan; Part 5, Emergency Plan (EP); and Part 6, Sensitive Unclassified Non-Safeguards Information (SUNSI).

Each part of the application is intended to stand alone to the extent practical. That is, information appearing within one part may be referenced elsewhere within the same part to minimize duplication; however, if the same information is used in more than one part, that information may be replicated so that each part may be used without reliance on another part. However, in certain instances, the amount of duplication between parts may be burdensome without a commensurate benefit such that information is referenced in another part with the exclusion of referencing the ER in the SSAR.

Part 1 – Administrative Information

This part contains an overview of the ESPA and general corporate information, including ownership, management, and boards of directors, as required by 10 CFR 50.33(a) through (d).

Part 2 – Site Safety Analysis Report (SSAR)

This part contains information about site safety, emergency preparedness, and quality assurance. The site safety section includes a description of the PSEG Site and proposed facilities, as required by 10 CFR 52.17(a)(1)(i) through (viii), an assessment of the site features affecting the facility design (e.g., major structures, systems, and components that bear significantly on site acceptability under the radiological consequence evaluation factors of 10 CFR 50.34(a)(1)), and meteorological, hydrologic, geologic, and seismic characteristics of the site. The described seismic characteristics demonstrate site compliance with the earthquake engineering criteria of 10 CFR 50, Appendix S, *Earthquake Engineering Criteria for Nuclear Power Plants,* as required by 10 CFR 50.34(a)(12) and (b)(10). Also included is a demonstration of site compliance with 10 CFR 100, *Reactor site criteria*, requirements for site suitability.

Regarding the description of the facilities for which the proposed site may be used, a particular reactor design has not been selected for construction at the PSEG Site. In order to provide sufficient design information to enable the NRC to determine that the proposed site is suitable for new units, a surrogate design has been provided as part of the application. The surrogate plant is a set of bounding parameters, the plant parameter envelope (PPE). The PPE approach has been accepted by the NRC in previous ESPs. The combination of PPE values and site

characteristics that form the licensing basis for NRC's issuance of an ESP are identified in the SSAR.

This part also discusses the capability of the facilities to withstand the natural and man-made environmental hazards of the site. The emergency preparedness information includes an assessment of any impediments to implementing an emergency plan at the ESP site, as required by 10 CFR 52.17(b)(1), and includes a complete and integrated emergency plan, as required by 10 CFR 52.17(b)(2), with inspections, tests, analyses, and acceptance criteria (ITAAC). The quality assurance program under which ESP-related activities were performed is also provided.

Where possible, the SSAR section numbers correspond to the section numbers identified in NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition*. Consistent with that guidance, there are some gaps in the numbering sequence. This is intentional. This approach is intended to facilitate subsequent integration of the information in this ESPA with a reactor design certification in a combined license (COL) application, in which the complete numbering sequence is used.

The regulatory bases for the SSAR include consideration of the following, as appropriate:

- NRC Regulations – 10 CFR 50, *Domestic licensing of production and utilization facilities*, 10 CFR 52, *Licenses, certifications, and approvals for nuclear power plants*, and 10 CFR 100

- NRC Regulatory Guide 1.70, *Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants*

- NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition*

- NRC Regulatory Guide 1.206, *Combined License Applications for Nuclear Power Plants (LWR Edition)*

- RS-002, *Processing Applications for Early Site Permits*

- Other applicable Regulatory Guides

The following briefly describes the individual chapters of the SSAR:

- Chapter 1, *Introduction and General Description*, includes an overview of the site and a discussion of development of the PPE, and the PPE listing.

- Chapter 2, *Site Characteristics*, includes geography, demography, nearby industrial installations, transportation facilities, meteorology, hydrology, geology, and seismic characteristics of the site.

- Chapter 3, *Design of Structures, Components, Equipment, and Systems*, includes only information on aircraft hazards.

- Chapter 11, *Radioactive Waste Management*, includes only information on liquid and gaseous radioactive releases.

- Chapter 13, *Conduct of Operations*, includes only an overview of emergency planning for the site and surrounding area in case of plant accidents and of the physical security provided for the site and plant sensitive areas.

- Chapter 15, *Transient and Accident Analyses*, includes a discussion of radiological consequence of bounding plant accidents and conformance with applicable 10 CFR 100, *Reactor Site Criteria* for the reactor technologies being considered.

- Chapter 17, *Quality Assurance*, includes the Quality Assurance Program (QAP) under which the ESP application was prepared.

Part 3 – Environmental Report

This part contains information about site environmental issues, as required by 10 CFR 51.45 and 51.50. This part also satisfies the application content requirement of 10 CFR 52.17(a)(2). It focuses on the environmental impacts to the PSEG Site from the construction and operation of one or more reactors having characteristics that fall within the PPE.

The ER discusses the existing environment surrounding the PSEG Site and in the vicinity of the site; postulates environmental impacts of construction and operation, and considers appropriate mitigation measures; reviews the impacts of design basis and severe accidents; and reviews alternative sites. This ER assesses impacts based on representative conditions developed from the facility designs included in the PPE, however, it does not postulate specific costs and benefits associated with construction or operation of any one design option.

For evaluation purposes, the following categories of information regarding interfaces of the proposed site and facilities are reviewed:

- Comparison of the functional operational needs of the facility as they relate to the site's natural and environmental resources.

- Impact of the facility on the site's natural and environmental resources.

The regulatory bases for the ER include consideration of the following:

- National Environmental Policy Act (NEPA)

- NRC Regulations – 10 CFR 51, *Environmental protection regulations for domestic licensing and related regulatory functions,* and 10 CFR 52

- NRC Regulatory Guide 4.2, *Preparation of Environmental Reports for Nuclear Power Stations*

- NUREG-1555, *Standard Review Plans for Environmental Reviews of Nuclear Power Plants: Environmental Standard Review Plan*

- Federal, regional, state, and local environmental statutes, as applicable

The following briefly describes the chapters of the ER:

- Chapter 1, *Introduction to the Environmental Report*, includes a discussion of the proposed project and purpose for the permit.

- Chapter 2, *Environmental Description*, examines the existing use of the site for the existing operating units, describes the current site and surrounding area, physical and ecological environment, and provides current socioeconomic, demographic, historic, and community characteristics.

- Chapter 3, *Plant Description*, describes the proposed facility considered for the PSEG Site. The description of the facility is based on the PPE and other parameters used in the assessment of the potential environmental impacts of construction and operation of a nuclear power plant at the site.

- Chapter 4, *Environmental Impacts of Construction*, describes the potential impacts on the surrounding environment for construction of the proposed facilities.

- Chapter 5, *Environmental Impacts of Station Operation*, describes the potential impacts of operating the proposed facilities at the PSEG Site.

- Chapter 6, *Environmental Measurements and Monitoring Program*, describes the programs used to monitor the environmental impacts of the construction and operation of the proposed facility.

- Chapter 7, *Environmental Impacts of Postulated Accidents Involving Radioactive Materials*, describes the potential radiological consequences, associated with operating a new nuclear plant at the PSEG Site, due to design basis accidents and severe accidents.

- Chapter 8, *Need for Power*, provides a need for power evaluation.

- Chapter 9, *Alternatives*, reviews potential alternatives (including alternative energy sources and sites) to constructing and operating a new nuclear plant at the PSEG Site.

- Chapter 10, *Environmental Consequences of the Proposed Action*, analyzes unavoidable adverse environmental impacts, irreversible commitments of environmental resources and cumulative impacts associated with construction and operation of the proposed facility at the PSEG Site.

Part 4 – Site Redress Plan

The Applicants, at the time of this submittal, do not plan to request a limited work authorization (LWA), as allowed by 10 CFR 50.10(e)(1) and 10 CFR 52.17(c); therefore, a Site Redress Plan, as required by 10 CFR 52.17(c) for LWA activities, is not required.

Part 5 – Emergency Plan (EP)

This part contains the emergency plan that is applicable to the proposed facilities. The emergency plan is a complete and integrated plan in accordance with 10 CFR 52.17(b)(2)(ii). The emergency plan is based on the existing SGS and HCGS emergency plan and is designed to be compliant with 10 CFR 50.47, *Emergency plans* and 10 CFR 50 Appendix E, *Emergency Planning and Preparedness for Production and Utilization Facilities*. It is based on the guidance contained in NUREG-0654, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,* Revision 1, November 1980. In addition, the emergency plan is designed to be compliant with 10 CFR 52.17(b)(1) and 10 CFR 52.17(b)(3). NUREG-0654, Supplement 2 is also used as guidance for the development of the emergency plan for the ESP process.

Part 6 – SUNSI

This part contains the information redacted from other parts of the application due to the sensitive or proprietary nature of the information. The only information redacted as sensitive information are the off-site emergency plans. The off-site emergency plans are being provided under a separate cover letter.

2.2 LABELING CONVENTIONS

Each page of this ESPA, except pages in the application title sheet and individual part title sheets, has a header and footer that identifies the part of this application to which it belongs and the current revision.

2.2.1 PAGINATION

Content pages are numbered to indicate their chapter and section (or subsection), and page within a section. For example page 4.14-84 is the 84th page in Chapter 4, Section 4.14. Tables located at the end of a section are similarly numbered with section page numbers. In addition, each chapter or part contains a Table of Contents, List of Tables, and List of Figures. The Table of Contents, List of Tables, and List of Figures list page numbers and are sequentially numbered i, ii, etc. with the chapter number indicated if applicable. Page numbers are located in the footer of each page.

2.2.2 PARAGRAPH NUMBERING

Within each part, chapters are numbered sequentially. Subtiered content is numbered based on the chapter number. The first level section headings of a chapter are two digit (e.g., 5.1 is the first Section of Chapter 5). The second level and subsequent headings increase by one digit for each level (e.g., 5.1.1, 5.1.1.1, etc.). References to sections are within a part unless otherwise specified. The Table of Contents for application parts is only specified down to the first level section of a chapter.

2.2.3 REFERENCES

Reference lists appear at the end of each section (i.e., the first subdivision within chapters) or first tier subsection (second subdivision within chapters). For example, the references list for Part 3, Section 1.4 appears at the end of Section 1.4. In general, NRC regulations or guidance documents (i.e., Code of Federal Regulations, NUREGs, Regulatory Guides, etc.) are not included in the reference list.

2.2.4 TABLES AND FIGURES

Tables are generally located at the end of the associated two-digit section; however, small tables less than one-third of a page may be placed within the text portion of the section. Each table typically begins on a new page. Multi-page tables have “Sheet X of Y” in parenthesis after the table number on each page. Figures are separate files and include a title block to indicate the figure number and corresponding part. Multi-page figures have “Sheet X of Y” in parenthesis after the figure number on each page. Tables and figures are numbered with their two-digit section number and a sequential number. For example, Figure 1.8-4 is the fourth figure for Section 1.8. In large sections, the tables are located at the end of the associated three-digit subsection, and the tables and figures are numbered with their three-digit subsection number and a sequential number.

2.2.5 DOCUMENT REVISION LEVEL

The current revision level of the document is denoted in the footer on each page. Figures contain a revision designator in the title block.

CHAPTER 3

GENERAL INFORMATION - 10 CFR 50.33

TABLE OF CONTENTS

CHAPTER 3

GENERAL INFORMATION - 10 CFR 50.33

3.1 NAMES OF APPLICANTS

The names of the applicants are as follows:

- PSEG Power, LLC
- PSEG Nuclear, LLC

3.2 ADDRESSES OF APPLICANTS

PSEG Power, LLC
80 Park Plaza, T4B
Newark, NJ 07102

and

PSEG Nuclear, LLC
80 Park Plaza, T4B
Newark, NJ 07102

3.3 DESCRIPTIONS OF BUSINESS OR OCCUPATION OF APPLICANTS

3.3.1 PSEG POWER, LLC

PSEG Power, LLC is a Delaware (DE) limited liability company, which is wholly owned by Public Service Enterprise Group Incorporated, a corporation formed under the laws of New Jersey (NJ).

3.3.2 PSEG NUCLEAR, LLC

PSEG Nuclear, LLC is a DE limited liability company formed to own and operate nuclear generating stations and is a wholly owned subsidiary of PSEG Power, LLC. PSEG Nuclear, LLC is the owner and licensed operator of the Hope Creek Generating Station and the partial owner and licensed operator of the Salem Nuclear Generating Station, Units 1 and 2. These existing nuclear generating stations are located on the PSEG Site that is the subject of this ESP application. It is anticipated that PSEG Nuclear, LLC will be the licensed operator of the new plant at the PSEG Site, which is the subject of this application.

3.4 DESCRIPTIONS OF ORGANIZATION AND MANAGEMENT OF APPLICANTS

PSEG Power, LLC

PSEG Power, LLC is a DE limited liability company, which is wholly owned by Public Service Enterprise Group Incorporated, a corporation formed under the laws of NJ and having its principal place of business in Newark, NJ.

PSEG Power, LLC has generating facilities in Connecticut, New Jersey, New York and Texas. PSEG Power, LLC power plants have a total installed generating capacity of nearly 13,300 megawatts as of August 2009.

PSEG Nuclear, LLC

PSEG Nuclear, LLC is organized under the laws of Delaware. PSEG Nuclear, LLC's principal place of business is in Hancock's Bridge, NJ. PSEG Nuclear, LLC is a wholly owned subsidiary of PSEG Power, LLC, a DE limited liability company, which is wholly owned by Public Service Enterprise Group Incorporated, a corporation formed under the laws of NJ with their headquarters and principal place of business in Newark, NJ. Public Service Enterprise Group Incorporated is a publicly traded corporation whose shares are widely traded on the New York Stock Exchange.

All of the Directors and principal officers of PSEG Nuclear, LLC, PSEG Power, LLC and Public Service Enterprise Group Incorporated are U.S. citizens. PSEG Nuclear, LLC, PSEG Power, LLC and its parent, Public Service Enterprise Group Incorporated, are not owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government.

The names and business addresses of PSEG Power, LLC's directors and principal officers, all of whom are citizens of the United States are listed in Table 3.4-1.

The Directors and principal officers of PSEG Nuclear, LLC and their addresses are presented in Table 3.4-2.

Table 3.4-1 Sheet (1 of 2)
Directors and Principal Officers of PSEG Power, LLC

Board of Directors (PSEG Power, LLC)

Name	Title	Address
R. Izzo	Director	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102
W. Levis	Director	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102
C. Dorsa	Director	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102
M. M. Pego	Director	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102
J. A. Bouknight, Jr.	Director	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102

Table 3.4-1 Sheet (2 of 2)
Directors and Principal Officers of PSEG Power, LLC

Principal Officers (PSEG Power, LLC)

Name	Title	Address
R. Izzo	Chairman of the Board and Chief Executive Officer	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102
W. Levis	President and Chief Operating Officer	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102
C. Dorsa	Executive Vice President and Chief Financial Officer	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102
J. A. Bouknight, Jr.	Executive Vice President	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102
D. M. DiRisio	Vice President and Controller	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102
B. D. Huntington	Vice President and Treasurer	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102
M. C. McCormick	Secretary	PSEG Power, LLC 80 Park Plaza T4B Newark, NJ 07102

Table 3.4-2
Directors and Principal Officers of PSEG Nuclear, LLC

Board of Directors (PSEG Nuclear, LLC)

Name	Title	Address
Shahid Malik	Director	PSEG Nuclear, LLC 80 Park Plaza T4B Newark, NJ 07102
Thomas P. Joyce	Director	PSEG Nuclear, LLC One Alloway Creek Neck Rd. Hancock's Bridge, NJ 08038
Richard P. Lopriore	Director	PSEG Nuclear, LLC 80 Park Plaza T4B Newark, NJ 07102

Principal Officers (PSEG Nuclear, LLC)

Name	Title	Address
Thomas P. Joyce	President and Chief Nuclear Officer	PSEG Nuclear, LLC One Alloway Creek Neck Rd. Hancock's Bridge, NJ 08038
Robert C. Braun	Senior Vice President and Chief Operating Officer	PSEG Nuclear, LLC One Alloway Creek Neck Rd. Hancock's Bridge, NJ 08038
Paul J. Davison	Vice President - Hope Creek	PSEG Nuclear, LLC One Alloway Creek Neck Rd. Hancock's Bridge, NJ 08038
John Perry	Vice President - Salem	PSEG Nuclear, LLC One Alloway Creek Neck Rd. Hancock's Bridge, NJ 08038
Christopher J. Schwarz	Vice President - Operations Support	PSEG Nuclear, LLC One Alloway Creek Neck Rd. Hancock's Bridge, NJ 08038