PART 1

Florida Power & Light Company
Turkey Point Plant, Units 6 & 7
COL Application

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Turkey Point Units 6 & 7

COL Application

Revision 6

Part 1

General and Financial Information

1.0 INTRODUCTION

This Combined License (COL) application is submitted by Florida Power & Light Company (FPL), for construction and operation of two nuclear power generating plants designated as Turkey Point Units 6 & 7. FPL is an investor-owned utility, primarily engaged in the generation, transmission, and distribution of electricity. In addition to seeking a COL to construct and operate Units 6 & 7, this application also seeks, through the inclusion of appropriate provisions in the COL, authorization to possess and use such quantities of source, byproduct, and special nuclear material as are needed to construct and operate the new units.

Units 6 & 7 are based on the Westinghouse AP1000 advanced light water reactor design. This application presents descriptions and analyses of the station design and incorporates by reference, Appendix D to 10 CFR Part 52 as required by Section III.B of that Appendix.

Units 6 & 7 will be located on the Turkey Point plant property, comprised of approximately 9400 acres in unincorporated southeast Miami-Dade County, Florida, east of Florida City and the City of Homestead and bordered by Biscayne Bay to the east. Currently located on the Turkey Point plant property are five FPL power plants: two natural gas/oil steam electric generating units (Units 1 & 2), two pressurized water reactor nuclear units (Units 3 & 4), and one natural gas combined cycle steam electric generating unit (Unit 5). The new units would be constructed on an approximately 218-acre area (the Units 6 & 7 plant area) south of Units 3 & 4.

The application contains the following parts:

Part 0	Cover letter, affidavits, etc.
Part 1	General and Financial Information
Part 2	Final Safety Analysis Report (FSAR)
Part 3	Environmental Report (ER)
Part 4	Technical Specifications
Part 5	Emergency Plan
Part 6	Limited Work Authorization (LWA)/Redress Plan — Not used
Part 7	Departures and Exemption Requests
Part 8	Physical Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan (provided under separate cover letter)
Part 9	Withheld Information
Part 10	License Conditions (including ITAAC)
Part 11	Enclosures

1.1 Purpose of the Combined License Application

The purpose of this COL application is to obtain Nuclear Regulatory Commission (NRC) approval to construct and operate two nuclear power generating plants, to be known as Turkey Point Units

6 & 7. FPL's purpose is to provide additional baseload generation to maintain system reliability, increase fuel diversity, and allow progress toward meaningful CO_2 emissions reductions.

In support of this objective, FPL requests the following license actions:

- A class 103 license, under 10 CFR Part 52, subpart C, authorizing FPL to construct, own, possess, use, and operate as a utilization facility Turkey Point Unit 6 for the generation of electric energy to be transmitted over the respective electric systems of FPL.

  In addition, this application is for the necessary licenses issued under 10 CFR Part 30, 10 CFR Part 40, and 10 CFR Part 70 to receive, possess, and use byproduct, source, and special nuclear material. Special nuclear material shall be in the form of reactor fuel and spent fuel, in accordance with limitations for storage and amounts required for reactor operation, as described in Part 2 of this application. Byproduct, source, and special nuclear material shall be in the form of sealed neutron sources for reactor startup and sealed sources for reactor instrumentation, radiation monitoring equipment, calibration, and fission detectors in amounts as required. In preparation for the initial fuel loading, limitations on byproduct material and Part 40 specifically licensed source material will be as described in this application. Following the 52.103(g) finding, byproduct, source, and special nuclear material in amounts as required, without restriction to chemical or physical form, shall be for sample analysis, instrument and equipment calibration, or associated with radioactive apparatus or components.

  It is requested that the term of the above licenses be for a period of 40 years from the date upon which the NRC makes a finding that acceptance criteria are met under 10 CFR 52.103(g).

- A class 103 license, under 10 CFR Part 52, subpart C, authorizing FPL to construct, own, possess, use, and operate as a utilization facility Turkey Point Unit 7 for the generation of electric energy to be transmitted over the respective electric systems of FPL.

  In addition, this application is for the necessary licenses issued under 10 CFR Part 30, 10 CFR Part 40, and 10 CFR Part 70 to receive, possess, and use byproduct, source, and special nuclear material. Special nuclear material shall be in the form of reactor fuel and spent fuel, in accordance with limitations for storage and amounts required for reactor operation, as described in Part 2 of this application. Byproduct, source, and special nuclear material shall be in the form of sealed neutron sources for reactor startup and sealed sources for reactor instrumentation, radiation monitoring equipment, calibration, and fission detectors in amounts as required. In preparation for the initial fuel loading, limitations on byproduct material and Part 40 specifically licensed source material will be as described in this application. Following the 52.103(g) finding, byproduct, source, and special nuclear material in amounts as required, without restriction to chemical or physical form, shall be for sample

analysis, instrument and equipment calibration, or associated with radioactive apparatus or components.

It is requested that the term of the above licenses be for a period of 40 years from the date upon which the NRC makes a finding that acceptance criteria are met under 10 CFR 52.103(g).

1.2 Combined License Application Format and Content

10 CFR 52.77 outlines the general information requirements for filing a COL application. An application must contain information required by 10 CFR 50.33, *Contents of Applications and General Information*, as it would apply to applicants for construction permits and operating licenses. This information is provided in Table 1 of this Part.

1.2.1 Format and Content

As specified by Appendix D to 10 CFR 52, IV.A.2.a, the plant-specific Final Safety Analysis Report (FSAR), has retained the organization and numbering of AP1000 Design Control Document (DCD), except where departures are taken and justified. Where departures are taken to section numbering to conform to RG 1.206 or the NRC's Standard Review Plan (SRP), a "roadmap" to the location of the descriptive material has been provided and left-hand margin notations are provided.

Throughout this application, the "referenced DCD" is the AP1000 DCD submitted by Westinghouse as Revision 19.

Financial information is provided consistent with the *Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance* (NUREG-1577, October 2003).

1.2.2 Labeling Conventions

Tables of data are identified by the section or subsection number followed by a sequential number. Tables are located at the end of a section immediately following the text. Drawings, pictures, sketches, curves, graphs, plots, and engineering diagrams are identified as figures and are numbered sequentially by section or subsection similar to tables, and follow at the end of the applicable section or subsection. Text pages are numbered sequentially within each section or subsection.

FSAR Table 1.1-202 describes the left margin annotations used in the FSAR to identify departures, supplementary information, COL items, and conceptual design information.

FSAR tables, figures, and references are numbered in the same manner as the DCD, but the first new FSAR item is numbered as 201, the second 202, the third 203, and consecutively thereafter.

When a table, figure, or reference in the DCD is changed, the change is appropriately left margin annotated as identified above.

When it provides greater contextual clarity, an existing DCD table or figure is revised by adding new information to the table or figure and replacing the DCD table or figure with a new one in the FSAR. In this instance, the revised table or figure clearly identifies the information being added, and retains the same numbering as in the DCD, but the table or figure number is revised to end with the designation "R" to indicate that the table or figure has been revised and replaced. For example, revised "Table 4.2-1" would become "Table 4.2-1R."

1.2.3 Restricted Data and Classified National Security Information

The combined license application for Units 6 & 7 does not contain any Restricted Data or other Classified National Security Information, nor does it result in any change in access to any Restricted Data or National Security Information. In addition, it is not expected that activities conducted in accordance with the proposed combined license will involve such information. However, in the event that such information does become involved, and in accordance with 10 CFR 50.37, "Agreement limiting access to Classified Information," FPL will not permit any individual to have access to, or any facility to possess, Restricted Data or National Security Information until the individual and/or facility has been approved for such access under the provisions of 10 CFR Part 25, "Access Authorization for Licensee Personnel," and/or 10 CFR Part 95, "Facility Security Clearance and Safeguarding of National Security Information and Restricted Data."

1.3 Financial Qualifications

Pursuant to the requirements of 10 CFR 50.33(f), an applicant for a COL is required to include information sufficient to demonstrate to the NRC the financial qualification of the applicant to carry out the construction and/or operation activities for which the application is sought. Entities that meet the definition of an "electric utility" in 10 CFR 50.2 are exempt from the requirement to demonstrate financial qualification to carry out operation activities and are required only to demonstrate financial qualification to carry out construction activities.

FPL is an electric utility as defined in 10 CFR 50.2. FPL generates and distributes electricity and recovers the cost of this electricity through cost-of-service based rates established by the Florida Public Service Commission and the Federal Energy Regulatory Commission (FERC). Thus, as addressed in 10 CFR 50.33(f), estimates of operating costs for the first five years of operation are not required to be submitted and FPL is required only to demonstrate financial qualification to carry out construction activities.

NextEra Energy, Inc. (which previously operated as FPL Group, Inc.) has two principal operating subsidiaries—FPL and NextEra Energy Resources. FPL is an investor-owned electric utility serving approximately 4.5 million customer accounts in the state of Florida. NextEra Energy Resources is

NextEra Energy, Inc's competitive energy subsidiary which produces the majority of its electricity from clean and renewable fuels.

FPL's common stock is held solely by NextEra Energy, Inc. NextEra Energy, Inc. (which previously operated as FPL Group, Inc.) is investor-owned, with 27,994 common stockholders on January 31, 2010.

FPL reports and filings to the Florida Public Service Commission and the U.S. Securities and Exchange Commission may be found at http://www.floridapsc.com/dockets/index.aspx and at http://www.sec.gov, respectively. NextEra Energy's 10-K Report (Reference 3) may be found at http://www.nexteraenergy.com to provide the information required by 10 CFR 50, Appendix C.

FPL will recover the cost of constructing the facility in accordance with Florida Statute 366.93, Cost recovery for the siting, design, licensing, and construction of nuclear and integrated gasification combined cycle power plants (Reference 1), and Florida Administrative Code R.25-6.0423, Nuclear or Integrated Gasification Combined Cycle Power Plant Cost Recovery (Reference 2).

The sources of long-term construction funding for Units 6 & 7 will be a mixture of internally generated cash and external funding. The external funding will come from a mix of debt and equity capital. FPL currently uses first mortgage bonds and equity contributions from NextEra Energy, Inc. to finance long-term utility assets.

In accordance with 10 CFR 50.33(f) and 10 CFR 50, Appendix C, the estimated total combined construction costs for Units 6 & 7 include plant costs ascribable to the nuclear plant itself, general and overhead plant costs (including any transmission and distribution costs ascribable to the plant), and nuclear fuel cost for the first core load. These costs are estimated in 2012 dollars. Licensing costs and preconstruction activities occur before actual construction and are included in the estimates. The breakdown of the estimated costs and their bases is described in Appendix 1A.

1.3.1 General Information

General information for the applicant is provided in Table 1. FPL is not a newly formed entity organized for the primary purpose of construction or operation of Units 6 & 7. FPL is not owned, controlled, or dominated by an alien, foreign corporation, or foreign government.

1.3.2 Decommissioning Costs and Financing

COL applicants are required to include, as part of their application, a report containing a certification that financial assurance for decommissioning will be provided in an amount that may be more, but not less, than the amount stated in the table in 10 CFR 50.75(a)(1).

1.3.2.1 Decommissioning Estimate

For Units 6 & 7, the calculation of the amount of decommissioning funds estimated to be required pursuant to 10 CFR 50.75 (c) is provided below.

Base amount for a pressurized water reactor greater than or equal to 3400 MWt:

1986 Base Cost = $105,000,000 (from 10 CFR 50.75(c)(1))

Estimated Cost (Year X) = (1986$ Base Cost) ($A L_x + B E_x + C B_x$)

= ($105,000,000) ((0.65 * 2.36) + (0.13 * 2.59) + (0.22 * 13.885))

= $517,000,000 per unit (Note 1)

Note 1: Total is rounded to millions of dollars

Where:

P = 3400 MWt (thermal power rating)

A = 0.65 Fraction of 1986 dollars attributable to labor, materials, and service (NUREG-1307, Rev. 15)

B = 0.13 Fraction of 1986 dollars attributable to energy and transportation (NUREG-1307, Rev. 15)

C = 0.22 Fraction of 1986 dollars attributable to waste burial (NUREG-1307, Rev. 15)

L_x = 2.36 Labor cost adjustment (Computed Below)

E_x = 2.59 Energy cost adjustment (Computed Below)

P_x = 1.85 U.S. Bureau of Labor Statistic's PPI of industrial electric power (Computed Below)

F_x = 3.61 U.S. Bureau of Labor Statistic's PPI of light fuel oils (Computed Below)

B_x = 13.885 LLW burial/disposition cost adjustment (NUREG-1307, Rev. 15)

L_x = Base 2005 L_x * 2nd Quarter 2013 ECI/100 = 1.98 * 119.3/100 = 2.36

P_x = Preliminary June 2013 industrial electric power PPI/January 1986 industrial electric power PPI = 211.7/114.2 = 1.85

F_x = Preliminary June 2013 Light Fuel Oils PPI/January 1986 Light Fuel Oils PPI = 295.8/82 = 3.61

$E_x = 0.58P_x + 0.42F_x = (0.58 * 1.85) + (0.42 * 3.61) = 1.07 + 1.52 = 2.59$

1.3.2.2 Decommissioning Funding

Therefore, FPL certifies that financial assurance for decommissioning Units 6 & 7 will be provided in the amount of $517,000,000 per unit. An external sinking fund in the form of a trust is the method that will be used to provide reasonable assurance of the availability of funds to decommission the facility. The cost of decommissioning will be recovered through electric rates. Amounts collected will be periodically transferred to the external trust. Such deposits along with trust fund earnings will provide an amount at least equal to the formula-derived decommissioning cost for the facility.

1.4 Radiological Emergency Response Plans

Radiological emergency response plans of state and local government entities that are wholly or partially within the plume exposure pathway emergency planning zone (EPZ), as well as the plans of the state and local government entities wholly or partially within the ingestion pathway EPZ are included in COL application, Part 5 - Emergency Plan.

1.5 Other Licenses Applied for or Issued

Environmental Report Table 1.2-1 lists the licenses and authorizations required for construction and operation of Units 6 & 7.

1.6 References

1. Florida Statute 366.93 Cost recovery for the siting, design, licensing, and construction of nuclear and integrated gasification combined cycle power plants. Available at https://www.leg.state.fl.us.

2. Florida Administrative Code R.25-6.0423 Nuclear or Integrated Gasification Combined Cycle Power Plant Cost Recovery. Available at https://www.flrules.org.

3. FORM 10-K, Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for NextEra Energy, Inc. (which previously operated as FPL Group, Inc.) and Florida Power & Light Company. Available at http://www.nexteraenergy.com.

4. ABWR Cost/Schedule/COL Project at TVA's Bellefonte Site, DE-AI07-04ID14620, Tennessee Valley Authority, August 2005.

Table 1 (Sheet 1 of 3)
Applicant General Information

Name of Applicant	**Florida Power & Light Company**
Address	700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408
Description of Business	FPL is a public utility incorporated under the laws of the state of Florida, with its principal office located in Juno Beach, Florida. FPL is an investor-owned utility, primarily engaged in the generation, transmission, and distribution of electricity. The service territory covers the southern third and almost the entire eastern seaboard of the state of Florida. FPL supplies electric service to approximately 4.5 million customer accounts.
Principal business location	700 Universe Boulevard Juno Beach, Florida 33408

Names, addresses, and citizenship of directors:

Company	**Name and Title**	**Address**	**Citizenship**
FPL	Eric E. Silagy Director	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Moray P. Dewhurst Director	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	James L. Robo Director	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA

Names, addresses, and citizenship of principal officers:

Company	**Name and Title**	**Address**	**Citizenship**
FPL	James L. Robo Chairman of the Board and Chief Executive Officer	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Eric E. Silagy President	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA

Table 1 (Sheet 2 of 3)
Applicant General Information

Company	Name and Title	Address	Citizenship
FPL	William L. Yeager Executive Vice President, Engineering, Construction & Integrated Supply Chain	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Moray P. Dewhurst Executive Vice President, Finance and Chief Financial Officer	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Deborah H. Caplan Executive Vice President, Human Resources and Corporate Services	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Charles E. Sieving Executive Vice President	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Antonio Rodriguez Executive Vice President — Transition	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Manoochehr K. Nazar Executive Vice President, Nuclear Division & Chief Nuclear Officer	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Miguel Arechabata Executive Vice President, Power Generation Division	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA

Dates for Completion of Construction:	
Unit 6	
Earliest	**Latest**
1Q 2021	1Q 2022
Unit 7	
Earliest	**Latest**
1Q 2022	1Q 2023

Table 1 (Sheet 3 of 3)
Applicant General Information

Regulatory Agencies with Jurisdiction over Rates and Services	Address of Regulatory Agency
The Florida Public Service Commission	2540 Shumard Oak Blvd., Tallahassee, FL 32399

Trade and News Publications to give reasonable notice of the application	Address of Publication
Miami-Dade and Broward Counties	
el Nuevo Herald	1 Herald Plaza Miami, Florida 33132
Miami Herald	1 Herald Plaza Miami, Florida 33132
South Florida Sun-Sentinel	200 E. Las Olas Blvd Fort Lauderdale, FL 33301
Palm Beach and Martin Counties	
Palm Beach Post	P.O. Box 24700 West Palm Beach, Florida 33416
Treasure Coast News (Scripps Treasure Coast Newspapers)	1939 S Federal Highway Stuart, Florida 34994

APPENDIX 1A ESTIMATED TOTAL CONSTRUCTION COST FOR TURKEY POINT UNITS 6 AND 7

Turkey Point Nuclear Units 6 & 7 Cost Estimate Range				
	Low Range		High Range	
	Total Dollars	Cost per kW	Total Dollars	Cost per kW
Power Plant and Supporting Construction	$6,202,567,649		$9,034,535,498	
Transmission and General Plant Costs	$1,615,537,787		$2,340,204,748	
Nuclear Fuel Inventory Cost for the First Core[(a)]	$34,998,943		$42,752,556	
Total Overnight Costs (2012$)	**$7,853,104,379**	**$3,570**	**$11,417,492,801**	**$5,190**
Escalation	$1,374,646,749		$2,020,718,864	
AFUDC	$3,583,932,972		$5,256,076,173	
Total Estimated Project Cost (Year Spent $)	**$12,811,684,100**	**$5,823**	**$18,694,287,838**	**$8,497**

(a) Leased fuel assumed.

The cost estimate has been developed over the course of the project. The estimate was initially developed by coupling information in the 2005 TVA Bellefonte Study (Reference 4) for the ABWR technology with FPL site-specific information. This produced an overnight capital cost estimate that was not technology-specific. Sensitivities were explored for labor, materials and scope to develop an overnight cost estimate range. The overnight cost estimate range was then combined with an assumed spend curve and assumptions for escalation and interest during construction to produce a total project cost estimate range. Following preliminary negotiations with the Westinghouse/Shaw consortium, a technology-specific cost estimate was developed in 2010 to reflect current pricing and project features. This cost estimate was consistent with, and at the high end of, the original cost estimate range, following adjustment for the specific reactor technology and annual escalation. Based on that validation, FPL has chosen to retain the original cost estimate range, as adjusted, as its best estimate. The cost estimate range remains consistent with the publicly available cost estimates of other U.S. AP1000 projects.