



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

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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. Additionally, FPL is requesting a Limited Work Authorization (LWA) consistent with 10 CFR Part 50.

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 11,000 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
- 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 CO₂ 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 as needed to construct and operate the utilization facility.

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 as needed to construct and operate the utilization facility.

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 17.

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.

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 FPL Group's competitive energy subsidiary which produces the majority of its electricity from clean and renewable fuels.

FPL's common stock is held solely by FPL Group, Inc. FPL Group, Inc. is investor-owned, with 28,774 common stockholders on January 31, 2009.

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. FPL Group's 2008 10-K Report may be found at <http://www.fplgroup.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, and Florida Administrative Code 25-6.0423, Nuclear Power Plant Cost Recovery.

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 FPL Group, Inc. to finance long-term utility assets.

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Part 1 — General and Financial Information

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 2007 dollars. Licensing costs and preconstruction activities occur before actual construction and are included in the estimates. The breakdown of the costs 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:

$$\begin{aligned} \text{1986 Base Cost} &= \$105,000,000 \text{ (from 10 CFR 50.75(c)(1))} \\ \text{Estimated Cost (Year X)} &= (\text{1986\$ Base Cost}) (A L_x + B E_x + C B_x) \\ &= (\$105,000,000) ((0.65 * 2.11) + (0.13 * 2.33) + (0.22 * 8.683)) \\ &= \$376,635,000 \text{ per unit.} \end{aligned}$$

Where:

- P = 3400 MWt (thermal power rating)
- A = 0.65 Fraction of 1986 dollars attributable to labor, materials, and service (NUREG-1307, Rev. 12)
- B = 0.13 Fraction of 1986 dollars attributable to energy and transportation (NUREG-1307, Rev. 12)
- C = 0.22 Fraction of 1986 dollars attributable to waste burial (NUREG-1307, Rev. 12)

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Part 1 — General and Financial Information

$L_x = 2.11$ Labor cost adjustment (Computed Below)

$E_x = 2.33$ Energy cost adjustment (Computed Below)

$P_x = 1.59$ U.S. Bureau of Labor Statistic's PPI of industrial electric power (Computed Below)

$F_x = 3.36$ U.S. Bureau of Labor Statistic's PPI of light fuel oils (Computed Below)

$B_x = 8.683$ LLW burial/disposition cost adjustment (NUREG-1307, Rev. 12)

$L_x = \text{Base 2005 } L_x * 4\text{th Quarter 2007 ECI} / 100 = 1.98 * 106.7/100 = 2.11$

$P_x = 01/2008 \text{ industrial electric power PPI} / 01/1986 \text{ industrial electric power PPI} = 181.8 / 114.2 = 1.59$

$F_x = 1/2008 \text{ Light Fuel Oils PPI} / 01/1986 \text{ Light Fuel Oils PPI} = 275.5/82 = 3.36$

$E_x = 0.58P_x + 0.42F_x = (0.58 * 1.59) + (0.42 * 3.36) = 0.92 + 1.41 = 2.33$

1.3.2.2 Decommissioning Funding

Therefore, FPL certifies that financial assurance for decommissioning Units 6 & 7 will be provided in the amount of \$376,635,000 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

Florida Statute 366.93 Cost recovery for the siting, design, licensing, and construction of nuclear and integrated gasification combined cycle power plants.

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Florida Administrative Code 25-6.0423 Nuclear or Integrated Gasification Combined Cycle Power Plant Recovery.

FORM 10-K, Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934, for the fiscal year ended December 31, 2008 for FPL Group, Inc. and Florida Power & Light Company. Available at http://www.fplgroup.com/reports/pdf/2008_10K.pdf.

Turkey Point Units 6 & 7
COL Application
Part 1 — General and Financial Information

**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		<p>FPL is a public utility incorporated under the laws of the state of Florida, with its principal office located in Juno Beach, Florida.</p> <p>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.</p>	
Principal business location		700 Universe Boulevard Juno Beach, Florida 33408	
Names, addresses, and citizenship of directors:			
Company	Name and Title	Address	Citizenship
FPL	Lewis Hay, III Director	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Armando J. Olivera Director	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Armando Pimentel, Jr. 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
FPL	Antonio Rodriguez Director	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	John A. Stall Director	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Edward F. Tancer Director	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA

Turkey Point Units 6 & 7
COL Application
Part 1 — General and Financial Information

**Table 1 (Sheet 2 of 3)
Applicant General Information**

Names, addresses, and citizenship of principal officers:			
Company	Name and Title	Address	Citizenship
FPL	Lewis Hay, III Chairman of the Board	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Edward F. Tancer Vice Chairman & Senior Vice President, Government Affairs-State	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Armando J. Olivera President and Chief Executive Officer	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Robert L. McGrath Executive Vice President, Engineering, Construction & Corporate Services	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Armando Pimentel, Jr. 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	James W. Poppell Executive Vice President, Human Resources	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Charles E. Sieving Executive Vice President & General Counsel	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Antonio Rodriguez Executive Vice President, Power Generation Division	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	John A. Stall Executive Vice President, Nuclear Division	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA
FPL	Manoochehr K. Nazar Senior Vice President & Chief Nuclear Officer	Florida Power & Light Company 700 Universe Boulevard Post Office Box 14000 Juno Beach, Florida 33408	USA

Turkey Point Units 6 & 7
COL Application
Part 1 — General and Financial Information

**Table 1 (Sheet 3 of 3)
Applicant General Information**

Dates for Completion of Construction:	
Unit 6	
Earliest	Latest
December 2017	December 2018
Unit 7	
Earliest	Latest
December 2019	December 2020

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 (Year Spent \$)						
	Case A		Case B		Case C	
	<u>Total Dollars</u>	<u>Cost per kW</u>	<u>Total Dollars</u>	<u>Cost per kW</u>	<u>Total Dollars</u>	<u>Cost per kW</u>
Power Plant Island and Supporting Construction	\$6,165,400,000	\$2,802	\$5,377,400,000	\$2,444	\$7,879,400,000	\$3,582
Transmission and General Plant Costs	\$1,710,700,000	\$778	\$1,427,900,000	\$649	\$2,068,400,000	\$940
Nuclear fuel inventory cost for the first core	\$36,100,000	\$16	\$32,500,000	\$15	\$39,700,000	\$18
Total Overnight Costs (2007\$)	\$7,912,200,000	\$3,596	\$6,837,800,000	\$3,108	\$9,987,500,000	\$4,540
Escalation @ 2.5%	\$1,962,400,000	\$892	\$1,680,800,000	\$764	\$2,505,800,000	\$1,139
AFUDC @ 11.04%	\$4,041,400,000	\$1,837	\$3,460,600,000	\$1,573	\$5,159,000,000	\$2,345
Preconstruction Cost Adjustment **	\$103,400,000	\$47	\$103,400,000	\$47	\$103,400,000	\$47
Total Estimated Project Cost	\$14,019,400,000	\$6,372	\$12,082,600,000	\$5,492	\$17,755,700,000	\$8,071

Case A - Two units at 1100 MW each, includes an assumed 2.5% general escalation to 2020, full owner scope, and mid-range transmission.

Case B - Two units at 1100 MW each, includes an assumed 2.5% general escalation to 2020, reduced owner scope, and low-range transmission.

Case C - Two units at 1100 MW each, includes an assumed 2.5% general escalation to 2020, full owner scope, and high-range transmission.

FPL surveyed current studies to identify a body of work that could be adapted into a cost estimating process for new nuclear in Florida. The primary source of the cost estimate is an interagency study conducted by an industry consortium, published in August of 2005 (the TVA Study). The TVA Study provides an evaluation of new nuclear generation construction in the United States under expected regulatory, design, logistic and labor conditions. The TVA Study provides a detailed and well-researched basis for new nuclear construction costs. Westinghouse was consulted to confirm that the assumptions used in the TVA Study would be generally consistent with construction of a Westinghouse AP1000 unit. Additionally, Owner specific costs related to the Turkey Point site were considered to modify the TVA study to an FPL specific cost estimate.

For the purposes of this cost estimate, it was assumed that commencement of construction is four to five years from the Florida PSC issuance of the Need Order and the end of construction is 12 years. Therefore, the impact to final project costs of market variations in materials, equipment and labor is difficult to predict. In order to recognize the potential impact of these variations, a range of costs were developed by varying specific cost assumptions regarding material and labor cost escalation, owner's scope and transmission costs.