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POLICY ISSUE

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Information

December 2, 2016

SECY-16-0136

FOR: The Commissioners

FROM: Victor M. McCree  
Executive Director for Operations

SUBJECT: STAFF STATEMENT IN SUPPORT OF THE UNCONTESTED HEARING  
FOR ISSUANCE OF COMBINED LICENSES FOR TURKEY POINT  
UNITS 6 AND 7 (DOCKET NOS. 52-040 AND 52-041)

PURPOSE:

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of the application for two combined licenses (COLs) to authorize construction and operation of Turkey Point Units 6 and 7, located in southeast Miami-Dade County, Florida. This subsequent COL (SCOL) application references the AP1000 Design Control Document (DCD), Revision 19.

The staff presents this information paper in accordance with the revised Internal Commission Procedures dated March 24, 2016. Issuance of this paper follows the issuance of the final safety evaluation report (FSER) on November 14, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16277A469). On October 28, 2016, the agency issued the Turkey Point final environmental impact statement (EIS) (NUREG-2176, Volumes 1, 2, 3, and 4 (ADAMS Accession Nos. ML16300A104, ML16300A137, ML16301A018, and ML16300A312)). This paper references draft COLs for Turkey Point Units 6 and 7 and the draft Summary Record of Decision (ADAMS Accession Nos. ML16302A259, ML16302A270, and ML16312A403, respectively). This paper does not address any new commitments or resource implications.

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This paper serves as the staff's primary pre-filed testimony for the uncontested (mandatory) hearing for issuance of the COLs for Turkey Point Units 6 and 7. This paper, with its references, also provides the information to support the Commission's determination that the staff's review has been adequate to support the findings set forth in Title 10 of the *Code of Federal Regulations* (10 CFR) 52.97, "Issuance of Combined Licenses," and 10 CFR 51.107, "Public Hearings in Proceedings for Issuance of Combined Licenses; Limited Work Authorizations."

In accordance with the Internal Commission Procedures, this paper focuses on non-routine matters with regard to areas of particular importance in supporting the findings related to 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," and Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." Non-routine matters are matters that relate to any unique features of the facility or novel issues that arose as part of the review process.

#### SUMMARY:

This paper addresses the findings in 10 CFR 52.97(a) and 10 CFR 51.107(a) and provides an adequate basis for the Commission to conclude that each of these findings can be made for the Turkey Point Units 6 and 7 COL application (COLA). This paper also focuses on such non-routine matters as unique features of the facility or novel issues that arose as part of the review process. This paper does not address routine aspects of the safety and environmental review process.

#### BACKGROUND:

##### I. Application History

###### *Application, Ownership, and Location*

In a letter dated June 30, 2009 (ADAMS Accession No. ML091830589), Florida Power & Light Company (FPL or the applicant,) submitted a COLA to the NRC for two Westinghouse Electric Company (Westinghouse) AP1000 pressurized-water reactors pursuant to the requirements of Sections 103 and 185b. of the Atomic Energy Act of 1954, as amended (AEA) and 10 CFR Part 52. FPL is an investor-owned utility primarily engaged in the generation, transmission, and distribution of electricity in the southern third of Florida as well as almost its entire eastern seaboard.

FPL will own both Turkey Point Units 6 and 7 and have responsibility for the costs and outputs of both facilities, if licensed. FPL is an electric utility as defined in 10 CFR 50.2, "Definitions," and is subject to the regulatory provisions of the Florida Public Service Commission, the NRC, and the Federal Energy Regulatory Commission.

These reactors will be identified as Turkey Point Units 6 and 7 and will be located in unincorporated southeast Miami-Dade County, Florida, east of Florida City and the City of Homestead, and bordered by Biscayne Bay to the east. The units would be constructed on an approximately 218-acre area south of the existing Turkey Point Units 3 and 4. FPL will be the licensed owner and operator of Turkey Point Units 6 and 7. The Turkey Point site has five FPL power plants: two natural gas/oil steam electric generating units (Units 1 and 2); two pressurized-water reactor nuclear units (Units 3 and 4); and one natural gas, combined-cycle,

steam electric generating unit (Unit 5). Additionally, FPL owns and operates St. Lucie Units 1 and 2 near Fort Pierce, Florida.

FPL most recently updated the Turkey Point Units 6 and 7 COLA on August 26, 2016 (ADAMS Accession No. ML16250A728). The publicly available portions of the application are available in ADAMS and on the NRC Web site at <http://www.nrc.gov/reactors/new-reactors/col/turkey-point.html>. Portions of the application that contain nonpublic information, including the security plan, which contains Safeguards Information are located on the NRC's secure local area network.

In addition, the applicant submitted a request for the associated materials licenses under 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material"; 10 CFR Part 40, "Domestic Licensing of Source Material"; and 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material." In addition, if the COLs are issued, FPL will be authorized to build and operate an independent spent fuel storage facility under the provisions of 10 CFR Part 72, Subpart K.

Part 1 (General and Administrative Information) of the COLA contains additional information about the applicant and ownership. Part 2 (Final Safety Analysis Report (FSAR)), Chapters 1 and 2, of the COLA includes additional information about the site location and characteristics.

#### *Referenced Design Certification and Design Certification Amendments*

The Turkey Point Units 6 and 7 COLA references the AP1000 certified design, as amended in DCD Revision 19. Westinghouse was the applicant for design certification of the AP1000 amended design. The NRC certified the Revision 19 design (ADAMS Accession No. ML11171A287) in Appendix D, "Design Certification Rule for the AP1000 Design," to 10 CFR Part 52. The NRC staff issued the FSER for this DCD (ADAMS Accession No. ML112061231) in August 2011 and subsequently published the FSER as Supplement 2 to NUREG-1793, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design," in September 2011, Volumes 1 and 2 (ADAMS Accession Nos. ML11293A087 and ML11292A141, respectively). On December 30, 2011, the NRC published the AP1000 design certification amendment final rule in the *Federal Register* (FR) (ADAMS Accession No. ML113480014).

#### *Subsequent Combined License*

The staff followed the design centered review approach which is described in Regulatory Issue Summary 2006-006, "New Reactor Standardization Needed to Support the Design-Centered Licensing Review Approach," dated May 31, 2006 (ADAMS Accession No. ML053540251). In this approach, the first COLA for a given design is designated the reference COL (RCOL) application and subsequent COLs are designated SCOL applications. The staff performs a single review of information documented in an RCOL application and, if identical information (designated as "standard") appears in a later SCOL application, the staff confirms that the appropriate information submitted by the SCOL applicant is identical to that previously reviewed for the RCOL application. The staff also evaluates any site-specific differences to ensure that they do not adversely affect the SCOL application analysis.

SECY-11-0110, "Staff Statement in Support of the Uncontested Hearing for Issuance of Combined Licenses and Limited Work Authorizations for Vogtle Electric Generating Plant,

Units 3 and 4 (Docket Nos. 52-025 and 52-026),” dated August 9, 2011, discusses how initially the Bellefonte Units 3 and 4 (Docket Nos. 52-014 and 52-015) COLA and later the Vogtle Electric Generating Plant (Vogtle) Units 3 and 4 COLA were designated as the RCOL application for the AP1000 design center (ADAMS Accession No. ML110600264).

The Turkey Point Units 6 and 7 COLA is designated as an SCOL application in the AP1000 design center, and it contains some of the same information initially evaluated in the FSER for the Vogtle Units 3 and 4 COLs. In addition, the staff applied the design centered review approach in Chapter 21, “Design Changes Proposed in Accordance with ISG-11,” of the FSER in conducting its evaluation of the five requests by the applicant to depart from the AP1000 certified design. These five departure requests were identical to departure requests in the Levy Nuclear Plant (Levy) Units 1 and 2 COL review, where Levy acted as the RCOL for these issues.

This paper does not discuss issues addressed under the Bellefonte Units 3 and 4 or Vogtle Units 3 and 4 COLA reviews that the staff recognized as “standard” matters under the design centered review approach and that are also applicable to the Turkey Point Units 6 and 7 COLA. The FSER for the Turkey Point Units 6 and 7 COLA identifies matters from the Bellefonte Units 3 and 4 and Vogtle Units 3 and 4 COL applications determined to be “standard” and applicable to the Turkey Point Units 6 and 7 COLA, and the FSER discusses them in Section 1.2.3.

#### *Advisory Committee on Reactor Safeguards*

To support the Advisory Committee on Reactor Safeguards (ACRS) in providing an independent review and report to the Commission on the Turkey Point Units 6 and 7 COLA, the staff presented the results of its safety review to the ACRS AP1000 subcommittee on August 18-19, 2016. The staff presented the results of its review to the ACRS full committee on September 8, 2016. ACRS issued its final report fulfilling the requirement of 10 CFR 52.87, “Referral to the Advisory Committee on Reactor Safeguards,” on September 16, 2016 (ADAMS Accession No. ML16257A535). The ACRS’s conclusions and recommendations and the staff’s response are discussed further in later sections of this paper.

## II. Outreach

### *Public Meetings*

Before the NRC received the Turkey Point Units 6 and 7 COLA, the staff held a public outreach meeting in Homestead, Florida, on April 23, 2009, to explain the safety and environmental review of the anticipated COLA, to describe opportunities for public participation in the review process, and to take questions from the public.

The NRC staff held two scoping meetings on July 15, 2010, in Homestead, Florida, to discuss the environmental scoping process and to give members of the public an opportunity to comment on environmental issues that the NRC should consider during its review of the application (ADAMS Accession No. ML102080607).

After issuing the draft EIS, NUREG-2176, “Environmental Impact Statement for Combined Licenses (COLs) for Turkey Point Nuclear Plant Units 6 and 7, Draft Report for Comment,” Volumes 1 and 2, dated February 27, 2015 (ADAMS Accession Nos. ML15055A103 and ML15055A109, respectively), the staff held three public meetings to provide an overview of

the draft EIS and to accept public comments on it. The first meeting took place on April 22, 2015, in Miami, Florida, and the last two took place on April 23, 2015, in Homestead, Florida.

In total, the staff conducted approximately 26 public meetings and public teleconferences during its review of the application.

### *Federal Register Notices*

The NRC published the following FR notices, as required for licensing process key milestones.

- After receiving the COLA on June 30, 2009, the NRC published notice of such receipt on August 3, 2009 (74 FR 38477).
- The NRC staff accepted the application for docketing on September 4, 2009, and published a notice of docketing on October 7, 2009 (74 FR 51621).
- On June 15, 2010, the NRC published a notice of intent to prepare an EIS and to conduct scoping (75 FR 33851).
- On June 18, 2010, the NRC published a notice of order, hearing, and opportunity to petition for leave to intervene (75 FR 34777).
- On November 18, November 25, December 2, and December 9, 2011, the NRC published notices of availability of the application in accordance with AEA Section 182c. and 10 CFR 50.43(a)(3) (76 FR 71608, 76 FR 72725, 76 FR 75566, and 76 FR 77021).
- On March 5, 2015, the NRC published a notice of availability of the draft EIS for public comment and information on planned public meetings to present an overview of the document and accept public comments (80 FR 12043).
- On May 28, 2015, the NRC published a notice reopening the comment period in support of the draft EIS for public comment (80 FR 30501).
- On November 2, 2016, the NRC published a notice of availability of the final EIS (81 FR 76392).

### *Consultations*

In accordance with Section 657 of the Energy Policy Act of 2005, the NRC consulted with the U.S. Department of Homeland Security (ADAMS Accession No. ML101890846). As part of its environmental review, in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), and other applicable statutes, including the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, and the National Historic Preservation Act (NHPA), the staff consulted with and obtained input from appropriate Federal, State, Tribal, and local organizations.<sup>1</sup> Consultation with the U.S. Fish and Wildlife Service (US FWS) and the National Marine Fisheries Service is currently in progress to determine whether

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<sup>1</sup> In regard to consultation under NHPA Section 106, the U.S. Army Corps of Engineers (USACE) was designated as the lead Federal agency, and the USACE has not completed consultation with Native American Tribes regarding activities that, for NHPA purposes, are outside the scope of the NRC's Federal undertaking.

or not building and operation of Turkey Point Units 6 and 7 will have an adverse effect on the Federally protected species or designated critical habitat and if measures to protect species and critical habitat need to be taken.

### *Adjudicatory Actions*

On June 18, 2010, the NRC published in the FR (75 FR 34777) a notice of hearing and opportunity to petition for leave to intervene in the Turkey Point Units 6 and 7 COL proceeding. In response to the notice of hearing, Citizens Allied For Safe Energy, Inc. (CASE); Mark Oncavage, Dan Kipnis, the Southern Alliance for Clean Energy, and the National Parks Conservation Association (collectively, the Joint Intervenors); and the Village of Pinecrest, a Florida municipality, separately submitted petitions seeking leave to intervene in the proceeding (ADAMS Accession Nos. ML102320556, ML102300581, and ML102280601, respectively).<sup>2</sup> The Village of Pinecrest also requested, in the alternative, to participate as an interested nonparty local government pursuant to 10 CFR 2.315(c). On August 31, 2010, the Chief Judge ASLB Panel, pursuant to a Commission delegation (ADAMS Accession No. ML102380343), designated an ASLB to preside over the contested proceeding (ADAMS Accession No. ML102430245). In a decision dated February 8, 2011, the ASLB determined that all three petitioners had established standing, admitted the Joint Intervenors, admitted CASE, and denied the Village of Pinecrest's request for leave to intervene but granted the Village's request to participate in the proceeding as an interested local governmental body (ADAMS Accession No. ML110591003). In its decision, the ASLB admitted the Joint Intervenors' proposed Contention NEPA 2.1 in part, and admitted portions of CASE's proposed Contentions 6 and 7.

The admitted portions of CASE's contentions have been resolved, and the ASLB dismissed CASE from the proceeding (ADAMS Accession Nos. ML12026A438, ML12059A343, ML12089A350, and ML14253A284). Joint Intervenors' Contention NEPA 2.1, as amended, remains pending before the ASLB. The procedural history and status of Contention NEPA 2.1 is briefly set forth below, as is a description of the two admitted CASE contentions.

### *Contention NEPA 2.1*

As originally proposed, Contention NEPA 2.1 related to the applicant's proposal to obtain reclaimed wastewater from the Miami-Dade Water and Sewer Department South District plant, use this water to cool the main condenser via cooling towers, and inject the blowdown into permeable strata (denoted as the Boulder Zone) approximately 2900 feet (ft.) (883.9 m) below the surface at the plant site. Specifically, Contention NEPA 2.1 asserted that the applicant's environmental report (ER) omitted analysis of the environmental effects of six constituents in the reclaimed wastewater.

Based on a subsequent revision to the application, the applicant moved to dismiss Contention NEPA 2.1 as moot, which the Board granted (ADAMS Accession No. ML12026A438). The Joint Intervenors contemporaneously submitted an amended Contention NEPA 2.1, which the Board modified and admitted on May 2, 2012 (ADAMS Accession No. ML12123A644). In response to subsequent FPL motions for summary disposition, the Board dismissed portions of amended Contention NEPA 2.1 and reformulated the contention (ADAMS Accession Nos. ML12243A323

<sup>2</sup> On August 20, 2009, CASE submitted a revised petition, which is available at ADAMS Accession No. ML102320411 and is included in the ADAMS package cited in the text. The Atomic Safety and Licensing Board (ASLB) designated to preside over the proceeding chose to treat the revised petition as CASE's originally filed petition, except to the extent it advanced late-filed arguments (ADAMS Accession No. ML110591003). The original CASE petition is available (ADAMS Accession No. ML102300287).

and ML16112A336). As reformulated by the ASLB, Contention NEPA 2.1 (ADAMS Accession No. ML16112A336) currently states the following:

The DEIS [draft EIS] is deficient in concluding that the environmental impacts from FPL's proposed deep injection wells will be "small." The chemicals ethylbenzene, heptachlor, tetrachloroethylene, and toluene in the wastewater injections at concentrations listed in DEIS Table 3-5 may adversely impact the groundwater should they migrate from the Boulder Zone to the Upper Floridan Aquifer.

On October 5, 2016, the ASLB issued a case management and scheduling order to govern the further course of the contested proceeding (ADAMS Accession No. ML16279A219).

#### *CASE Contention 6*

The ASLB identified the inadmissible portions of proposed CASE Contention 6 and admitted the remainder of Contention 6, as revised by the ASLB (ADAMS Accession No. ML110591003). As admitted, Contention 6 stated:

Because there currently is no access to an offsite LLRW [low-level radioactive waste] disposal facility for proposed Units 6 and 7, and because it is reasonably foreseeable that LLRW generated by normal operations will need to be stored at the proposed site for longer than the two-year period contemplated in FPL's ER, the analysis in the ER is inadequate because it fails to address environmental impacts in the event the applicant will need to manage Class B and Class C LLRW on the Turkey Point site for a more extended period of time.

Contention 6 addressed environmental aspects of LLRW storage.

In Revision 3 to the COL application, filed on December 16, 2011, FPL included information to address the omission raised in Contention 6 (ADAMS Accession Nos. ML11362A133, ML11362A163, and ML11362A165). On January 3, 2012, in light of Revision 3 to the application, FPL filed a motion to dismiss as moot CASE Contention 6 (ADAMS Accession No. ML12003A107). CASE did not oppose the FPL motion (ADAMS Accession No. ML12023A166). Accordingly, the ASLB dismissed CASE Contention 6 as moot (ADAMS Accession No. ML12026A438). Although CASE proffered a new Contention 10, which CASE asserted was based on new information in the FPL motion to dismiss Contention 6 as moot, the ASLB determined that proposed Contention 10 was not timely filed, nor did it meet the contentions admissibility standards in 10 CFR 2.309(f) (ADAMS Accession No. ML12089A350). Accordingly, the ASLB declined to admit proposed CASE Contention 10.

#### *CASE Contention 7*

The ASLB revised and admitted a portion of CASE Contention 7 (ADAMS Accession No. ML110591003), which stated:

FPL's COLA fails to provide information sufficient to enable the NRC to reach a final conclusion on safety matters regarding the

means for controlling and limiting radioactive material and effluents and radiation exposures within the limits set forth in Part 20 and ALARA [as low as is reasonably achievable] in the event FPL needs to manage Class B and Class C LLRW for an extended period.

CASE Contention 7 addressed safety aspects of low-level radioactive waste storage.

In Revision 3 to the COL application, filed on December 16, 2011, FPL included information to address the omission raised in Contention 7 (ADAMS Accession No. ML11362A133). On January 3, 2012, in light of Revision 3 to the application, FPL filed a motion for summary disposition of CASE Contention 7 (ADAMS Accession No. ML12003A108). CASE did not oppose the FPL motion (ADAMS Accession No. ML12023A166). Accordingly, the ASLB dismissed CASE Contention 7 (ADAMS Accession No. ML12059A343).<sup>3</sup>

*Contentions filed after the filing date set in the Notice of Hearing*

Following the Fukushima nuclear power plant accident in Japan in March 2011, a petition to suspend all reactor licensing decisions and certain aspects of ongoing licensing proceedings was filed in several proceedings, including Turkey Point, beginning on April 14, 2011. The Commission denied the suspension petition, but granted the intervenors' request for a safety analysis to the extent that the NRC would conduct a short-term and long-term lessons learned analysis of the Fukushima accident (ADAMS Accession No. ML11252A847).

On February 13, 2013, the Joint Intervenors filed a motion for leave to admit a new contention (ADAMS Accession No. ML13087A439). The ASLB concluded the proposed contention was not ripe and denied it without prejudice (ADAMS Accession No. ML13087A439).

On February 27, 2014, a petition was filed in this and other proceedings to suspend licensing decisions pending the resolution of a rulemaking petition regarding the environmental impacts of high-density spent fuel pool (SFP) storage. The Commission denied this petition on July 17, 2014 (ADAMS Accession No. ML14198A106).

On June 12, 2014, the Joint Intervenors filed a motion for leave to file a new environmental contention. Based on information included in an FPL update to the environmental report, the Joint Intervenors later filed a motion to withdraw the proposed contention, which the ASLB granted (ADAMS Accession No. ML14178A860).

A contention, motion to reopen, and suspension petition concerning safety issues related to the disposal of spent nuclear fuel were filed in this proceeding and others on September 29, 2014. The Commission denied the contention, motion to reopen, and suspension petition on February 26, 2015 (ADAMS Accession No. ML15057A277).

On April 13, 2015, CASE and the City of Miami separately petitioned for leave to intervene in the proceeding and proposed new contentions challenging various aspects of the draft EIS, and

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<sup>3</sup> Although CASE proffered a new Contention 9, which CASE asserted was based on new information in the FPL motion for summary disposition of Contention 7, the ASLB determined that the CASE request was effectively an opposition to the FPL motion for summary disposition of CASE Contention 7 and was untimely filed (ADAMS Accession No. ML12089A350). Further, the ASLB determined that proposed CASE Contention 10 did not meet the contention requirements of 10 CFR 2.309(f)(1). Accordingly, the ASLB declined to admit proposed CASE Contention 10.



the Joint Intervenors filed a motion to admit a new contention challenging the draft EIS. The ASLB addressed each of these filings as follows: the ASLB denied the CASE petition for failure to meet the requirements for contention admissibility (ADAMS Accession No. ML15176A662). While the ASLB denied the City of Miami's petition for leave to intervene because the City's proposed contentions were untimely filed or failed to meet the contention admissibility requirements, the ASLB did grant the City's request to participate in the proceeding as an interested governmental body (ADAMS Accession No. ML15161A401). The ASLB declined to admit Joint Intervenors' proposed contention for failure to meet the contention admissibility requirements (ADAMS Accession No. ML15233A300).

### III. Review Process/Methodology

The key processes and methodologies used to ensure quality, consistency, and completeness in preparation of the FSER and final EIS are described below.

**NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: (LWR [Light Water Reactor] Edition)."** The principal purpose of the standard review plan (SRP) is to ensure the quality and uniformity of staff safety reviews. The staff uses the SRP as a routine tool for evaluating the safety of nuclear power plant designs. The SRP, comprehensively updated in 2007, is the most definitive basis available for evaluating whether an application meets the set of regulations established by the Commission. Each section of the SRP outlines the specific regulations that will be met when the review is complete, including the general design criteria from Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." Section 1.9.2 of the applicant's FSAR identifies the departures from the SRP associated with the Turkey Point Units 6 and 7 COLA. This listing does not include SRP departures associated with the AP1000 DCD that have been incorporated by reference.

**NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan."** This guidance, including a 2007 update that addresses environmental reviews for COLAs, includes environmental SRPs that NRC staff uses when conducting environmental reviews of applications related to nuclear power plants, in accordance with NEPA and the NRC's NEPA implementing regulations in 10 CFR Part 51.

**NUREG-2157, "Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel,"** (ADAMS Accession No. ML14198A440). The NRC prepared a final generic EIS that provides a regulatory basis for the final rule entitled, "Continued Storage of Spent Nuclear Fuel." As directed by 10 CFR 51.23(b), the impacts assessed in NUREG-2157 are deemed to be incorporated in an EIS for a COLA.

**SRM-SECY-12-0025, "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami,"** (ADAMS Accession No. ML120690347). This staff requirements memorandum (SRM) provides direction to the staff on implementing the Commission-approved recommended actions to be taken in response to Fukushima lessons learned.

**Design-Centered Review Approach, SECY-06-0019, "Semiannual Update on the Status of New Reactor Licensing Activities and Future Planning for New Reactors"** (ADAMS Accession No. ML053530315). Under the design-centered review approach, the Office of New Reactors has used, to the extent practicable, a "one issue-one review-one position" strategy to optimize the review effort and resources needed to perform these reviews. Within the AP1000

design center, the staff has conducted one technical review for each reactor design issue and is using this one decision to support the review of multiple COLAs.

**Regulatory Guides.** Regulatory guides (RGs) provide guidance to licensees and applicants on implementing specific parts of the NRC's regulations, techniques used by the NRC staff in evaluating specific problems or postulated accidents, and data needed by the staff in its review of applications for permits or licenses. Appendix 1AA, "Conformance with Regulatory Guides," to the applicant's FSAR identifies the RGs associated with the Turkey Point Units 6 and 7 COLA and noted whether the applicant conformed with or departed from each RG. This list does not include departures from regulatory guidance associated with the AP1000 DCD that have been incorporated by reference.

**Interim Staff Guidance.** For areas in which the existing SRP does not contain review guidance, the staff prepared and used interim staff guidance (ISG) documents. ISGs are found at <http://www.nrc.gov/reading-rm/doc-collections/isg/>. The ISGs clarify technical review approaches and address questions related to processes and licensing. The staff used the following ISGs in the Turkey Point Units 6 and 7 COL review, and indicated below is the FSER section(s) to which each ISG primarily relates:

- DC/COL-ISG-1, "Interim Staff Guidance on Seismic Issues of High Frequency Ground Motion," dated May 19, 2008; FSER Section 19.55
- DC/COL-ISG-3, "PRA Information to Support Design Certification and Combined License Applications," dated June 11, 2008; FSER Sections 19.55, 19.58, and 19.59
- DC/COL-ISG-7, "Assessment of Normal and Extreme Winter Precipitation Loads on the Roofs of Seismic Category I Structures," dated June 23, 2009; FSER Section 2.3.1
- DC/COL-ISG-8, "Necessary Content of Plant-Specific Technical Specifications," dated December 9, 2008; FSER Section 16.1
- DC/COL-ISG-11, "Finalizing Licensing-Basis Information," dated November 2, 2009; FSER Section 1.1
- DC/COL-ISG-15, "Post-Combined License Commitments," dated October 7, 2009; FSER Sections 1.4.4 and 1.5.5
- DC/COL-ISG-16, "Compliance with 10 CFR 50.54(hh)(2) and 10 CFR 52.80(d)," (nonpublic), dated June 9, 2010; FSER Section 19A
- DC/COL-ISG-17, "Ensuring Hazard-Consistent Seismic Input for Site Response and Soil Structure Interaction Analyses," issued March 24, 2010; FSER Section 20.1
- DC/COL-ISG-20, "Seismic Margin Analysis for New Reactors Based on Probabilistic Risk Assessment," dated March 15, 2010; FSER Sections 19.55 and 19.58
- DC/COL-ISG-22, "Interim Staff Guidance on Impact of Construction of New Nuclear Power Plants on Operating Units at Multi-Unit Sites," dated February 7, 2011; FSER Section 1.4.4

- JLD-ISG-2012-01, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated August 29, 2012; FSER Section 20.2
- JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," dated August 29, 2012; FSER Section 20.3
- NSIR/DPR-ISG-01, "Emergency Planning for Nuclear Power Plants," dated November 2011; FSER Section 13.3

The staff used the following ISGs in the final EIS for the Turkey Point Units 6 and 7 COL review:

- COL/ESP-ISG-026, "Environmental Issues Associated with New Reactors," dated September 3, 2014
- DC/COL-ISG-3, "Probabilistic Risk Assessment Information to Support Design Certification and Combined License Applications," dated June 11, 2008

**Office Instructions.** In its review, the staff followed administrative guidance contained in office instructions. These internal documents address a range of procedural matters, including the staff's process for issuing requests for additional information (RAIs); handling audits; ensuring the qualification and training of technical staff and managers; ensuring consistency between staff offices; and overseeing interactions with applicants, intervenors, and public stakeholders.

#### IV. Advisory Committee on Reactor Safeguards Report

The ACRS review of the Turkey Point Units 6 and 7 COLA resulted in a letter to the Commission dated September 16, 2016. This report fulfills the requirement of 10 CFR 52.87 that ACRS report on those portions of the application that concern safety. The ACRS concluded that there is reasonable assurance that Turkey Point Units 6 and 7 can be built and operated without undue risk to the health and safety of the public and recommended that the COLA for these units be approved. The ACRS also recommended that the following proposed site-specific departures from the AP1000 DCD be approved:

- consolidation of the Technical Support Center (TSC) to provide support to Turkey Point Units 3, 4, 6, and 7;
- meteorological exceedances for the operating basis wind speed and for the maximum safety and maximum normal wet bulb air temperatures; and
- exclusion area boundary minimum distance.

Finally, the ACRS recommended that the staff consider if existing guidance for estimating future sea level rise and guidance for location of the TSC should be updated to reflect changing circumstances.

The staff responded to the ACRS by letter dated November 4, 2016 (ADAMS Accession No. ML16278A293), stating that the staff is confident the design basis probable maximum storm surge and tsunami analyses for Turkey Point Units 6 and 7 appropriately account for the uncertainty in sea level projections and that the staff will continue to monitor evolving advances in external hazards science, including climate change, and will update regulatory guidance as

needed. Regarding the location of the TSC, the response stated that the staff will consider supplementing its guidance in this area, including updating NUREG-0696, in the future as resources permit.

V. Near-Term Task Force Recommendations Regarding the Evaluation of Fukushima Dai-ichi Nuclear Power Plant Events and the Review of the Application

SECY-12-0025, "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," (ADAMS Accession No. ML12039A103) and its associated SRM (ADAMS Accession No. ML120690347) address the requirements and regulatory actions resulting from the Fukushima Near-Term Task Force (NTTF) Tier 1 recommendations. The NRC staff determined that the three NTTF Tier 1 recommendations below were applicable to the Turkey Point Units 6 and 7 COLA.

1. Recommendation 4.2: Equipment covered under 10 CFR 50.54(hh)(2) – Order licensees to provide reasonable protection for equipment currently provided pursuant to 10 CFR 50.54(hh)(2) from the effects of design-basis external events and to add equipment as needed to address multiunit events while other requirements are being revised and implemented.
2. Recommendation 7.1: SFP instrumentation – Order licensees to provide reliable SFP level instrumentation.
3. Recommendation 9.3: Emergency preparedness regulatory actions (staffing and communications) – Order licensees to do the following until rulemaking is complete:
  - determine and implement the required staff to fill all necessary positions for response to a multiunit event; and
  - provide a means to power communications equipment needed to communicate on site (e.g., radios for response teams and between facilities) and offsite (e.g., cellular telephones and satellite telephones) during a prolonged station blackout.

The NRC staff evaluated the applicant's submittals relative to the three NTTF Tier 1 recommendations in FSER Chapter 20, "Requirements Resulting from Fukushima Near-Term Task Force Recommendations." A discussion of the remaining Tier 1 recommendations and why they did not apply to the Turkey Point Units 6 and 7 COLA review appears in the introduction to Chapter 20 of the FSER. The draft licenses for Turkey Point Units 6 and 7 contain license conditions to address Recommendations 4.2, 7.1, and 9.3.

*Fukushima NTTF Recommendation 4.2, Mitigation Strategies for Beyond-Design-Basis Events*

In SECY-12-0025, the NRC staff indicated its intent to review information provided by COL applicants to describe their mitigating strategies for beyond-design-basis external events. The AP1000 standard design includes passive design features that provide core cooling, containment, and SFP cooling capabilities for 72 hours, without reliance on alternating current (ac) power. The AP1000 design also includes equipment to maintain required safety functions in the long term (beyond 72 hours to 7 days). As such, provisions related to obtaining sufficient offsite resources to sustain these functions indefinitely must be addressed. The corresponding staff review for Turkey Point Units 6 and 7 appears in Section 20.1 of the FSER.

The NRC staff reviewed the applicant's description of mitigating strategies for Turkey Point Units 6 and 7 to determine if the strategies provide assurance of core cooling, containment, and SFP cooling capabilities in the event of a beyond-design-basis external event resulting in an extended loss of ac power event. The staff finds that the approach for mitigating beyond-design-basis external events described in the COLA for Turkey Point Units 6 and 7 is consistent with NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events," and both general and AP1000-specific NRC guidance (including Nuclear Energy Institute (NEI) 12-06, "Diverse and Flexible Coping Strategies Implementation Guide," Appendix F, as endorsed by the NRC staff). Therefore, the staff concludes that the mitigating strategies for beyond-design-basis external events described for Turkey Point Units 6 and 7 are acceptable.

The staff proposes to include License Condition (20-1), "Mitigation Strategies for Beyond-Design-Basis External Events," to verify the implementation of the mitigating strategies for beyond-design-basis external events at Turkey Point Units 6 and 7.

*Fukushima NTTF Recommendation 7.1, Spent Fuel Pool Instrumentation*

SECY-12-0025 states that the staff will request all COL applicants to provide information regarding SFP instrumentation through the review process. The corresponding staff review for Turkey Point Units 6 and 7 appears in Section 20.2 of the FSER. The NRC issued an RAI requesting that the applicant address this recommendation. The applicant provided the Westinghouse Technical Report, "Response to NRC Orders EA-12-051 and EA-12-063, and Background Information for Future Licensees on AP1000 Spent Fuel Pool Instrumentation, Redacted" (ADAMS Accession No. ML13023A265). The report adequately identified aspects of the AP1000 certified design that addressed requirements for arrangement, environmental qualification, power supply, and display, and provided additional information about accuracy and recalibration following an extended loss of power. The applicant incorporated key aspects of the additional recalibration information into Section 9.1.3 of the FSAR. The applicant provided a license condition to address the maintenance and training requirements.

The staff proposes to include License Condition (20-2) to verify the implementation of NTTF Recommendation 7.1.

*Fukushima NTTF Recommendation 9.3, Emergency Preparedness Communications and Staffing*

SECY-12-0025 states that the staff will request all COL applicants to provide information regarding emergency preparedness communications and staffing through the review process. The corresponding staff review for Turkey Point Units 6 and 7 appears in Section 20.3 of the FSER.

The NRC issued an RAI dated May 1, 2012, to the applicant, concerning implementation of the Fukushima NTTF Recommendation 9.3 in the Turkey Point Units 6 and 7 COLA. In response, the applicant proposed a license condition to address the 10 CFR 50.54(f) request for information letters sent to existing licensees—including COL applicants—regarding communications and staffing for NTTF Recommendation 9.3. This license condition was subsequently revised in the license application. As part of its proposed license condition, the applicant committed to perform assessments for NTTF Recommendation 9.3 using NEI 12-01, Revision 0, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities," confirmed by the staff to be an acceptable method for licensees

to employ when responding to the 10 CFR 50.54(f) letters on NTTF Recommendation 9.3. The applicant proposed the license condition on communications and staffing in Section C of License Condition 12 in Part 10 of the Turkey Point Units 6 and 7 COLA. The staff reviewed the applicant's proposed license condition and revised the timeframe for the completion of this license condition to be consistent with the schedules provided in section (a) of 10 CFR 52.99, "Inspection during construction; the inspection, test, analysis, and acceptance criteria (ITAAC) schedules and notifications; NRC notices," and section (a) of 10 CFR 52.103, "Operation under a combined license."

The staff proposes to include License Condition (20-3) to verify the implementation of NTTF Recommendation 9.3.

## DISCUSSION:

### I. Excluded Matters

This paper does not discuss matters that were previously addressed and resolved in the context of other reviews undertaken as part of the 10 CFR Part 52 process. Such excluded matters include issues addressed under the AP1000 design certification amendment review.

Also excluded from consideration in the uncontested hearing are substantive issues within the scope of contentions admitted and adjudicated during the COL contested proceeding, as described above in the Background section on "Adjudicatory Actions."

### II. Exemptions and Departures

Part 7 of the Turkey Point Units 6 and 7 COLA requested 8 exemptions and identified 17 departures from the AP1000 certified design. Four of the departures are unique to the Turkey Point Units 6 and 7 COLA. Other departures are common to other AP1000 COLAs. Those departures discussed in Chapter 21 of the FSER mirror ones that were first proposed in the Levy Units 1 and 2 COLA. These departures also contain changes to the AP1000 Tier 1 information or technical specifications (TS). As such, exemptions are required in accordance with 10 CFR Part 52 Appendix D, Section VIII, in order for the staff to find them acceptable.

#### *Exemptions from NRC Regulations*

The staff evaluated and found acceptable the following nine exemptions from NRC regulations associated with the review of the application.

Description	Regulation	Location of Evaluation in FSER
COL Application Organization and Numbering	10 CFR Part 52, Appendix D, Section IV.A.2.a	1.5.4
Maximum Safety Wet Bulb (Noncoincident) Air Temperature	10 CFR 70.22(b), 70.32(c), 74.31, 74.41, 74.51	2.0.4
Special Nuclear Material Control and Accounting Program Description	10 CFR 70.22(b), 70.32(c), 74.31, 74.41, 74.51	1.5.4
Containment Cooling Changes in regard to Passive Core Cooling System Condensate Return	AP1000 DCD Tier 1 Tables 2.2.3-1 and 2.2.3-2 and TS Surveillance Requirement (SR) 3.5.4.7	21.1
Main Control Room Dose	AP1000 DCD Tier 1 Subsection 2.7.1 and Tables 2.2.5-1 and 2.2.5-5 and TS Limiting Condition for Operation 3.7.4 and TS SR 3.7.4.1	21.2
Main Control Room Heatup	AP1000 DCD Tier 1 Tables 2.2.5-1, 2.2.5-4, 2.5.2-3 and 2.5.2-4, and TS 3.3.2 and 3.7.6	21.3
Combustible Gas Control in Containment	AP1000 Tier 1 Table 2.3.9-3	21.4
Source Range Neutron Flux Doubling Block Permissive	AP1000 TS Table 3.3.2-1	21.5
Exemption from 10 CFR 52.93(a)(1) <sup>4</sup>	10 CFR Part 52 Appendix D, Section III.B	1.5.4

a. Exemption Requests Common to Other COL Applicants Referencing the AP1000 Design

The following departures concern five generic issues that affect standard content material for the AP1000. The applicant incorporated in the Turkey Point Units 6 and 7 COLA the same information that Duke Energy Florida incorporated into the Levy Units 1 and 2 COLA

<sup>4</sup> Part 7 of the Turkey Point Units 6 and 7 COLA does not include an exemption request related to the requirements found in 10 CFR 52.93(a)(1). As discussed in Section 1.5.4 of the FSER, the staff determined that an exemption from this regulation is necessary.

regarding these departures. The staff's reasoning for finding these departures acceptable is the same as that used to address the corresponding departures in the Levy Units 1 and 2 COLA review (SECY-16-0076 (ADAMS Accession No. ML12188A087)) and the William States Lee Units 1 and 2 COLA review (SECY-16-0094 (ADAMS Accession No. ML16216A079)):

- containment cooling changes in regard to passive core cooling system condensate return;
- main control room dose;
- main control room heatup;
- combustible gas control in containment; and
- source range neutron flux doubling block permissive.

b. Other Exemptions

Exemption from 10 CFR 52.93(a)(1) and COL application organization and numbering

In STD DEP 1.1-1, the applicant renumbered Turkey Point COL FSAR sections to include content consistent with RG 1.206, "Combined License Applications for Nuclear Power Plants," and NUREG-0800. The departure and the exemption associated with the numbering scheme of the FSAR are closely related.

Before considering whether this numbering exemption should be granted, the staff needed to address a threshold question regarding the review standard applicable to the request. Under 10 CFR 52.93(a)(1), if a request for an exemption is from any part of a design certification rule, then the Commission may grant the exemption if the exemption complies with the appropriate change provision in the referenced design certification rule, or if there is no applicable change provision, if the exemption complies with 10 CFR 52.63, "Finality of Standard Design Certifications." Here, there is no applicable change provision in the referenced design certification rule, so according to 10 CFR 52.93(a)(1), the exemption must meet 10 CFR 52.63. However, the standards of the appropriate provision of 10 CFR 52.63 applicable to requests for exemptions from a design certification rule in 10 CFR 52.63(b)(1), by their terms, also do not apply to this change. Specifically, 10 CFR 52.63(b)(1) applies to changes to "certification information" and not administrative or procedural design certification rule provisions such as this one under consideration. In the Statements of Consideration for 10 CFR 52.63 dated August 28, 2007, the Commission stated that it used the "phrase 'certification information' in order to distinguish the rule language in the DCRs [design certification rules] from the design certification information (e.g., Tier 1 and Tier 2) that is incorporated by reference in the DCRs," (72 FR 49444). The exemption requested from the AP1000 DCD numbering scheme is an exemption from rule language, not Tier 1 or Tier 2 information; therefore, 10 CFR 52.63 should not be used to analyze this exemption.

Because there is not an applicable change provision in the referenced design certification, and because 10 CFR 52.63(b)(1) does not apply to this exemption, the exemption cannot comply with the plain language of 10 CFR 52.93(a)(1). In this situation, the language of 10 CFR 52.93(a)(1) does not appear to serve the underlying purpose of the regulation as described by the Commission in the Statements of Consideration to the rule, in which the Commission stated that only changes to certification information must meet 10 CFR 52.63. Instead, this exemption should have fallen under 10 CFR 52.93(a)(2), and, thus, be analyzed under the requirements in



10 CFR 52.7, "Specific Exemptions." Therefore, the staff finds that, pursuant to 10 CFR 52.7, an exemption to 10 CFR 52.93(a)(1) should be granted.

Pursuant to the exemption described above, the NRC staff has reviewed the exemption related to STD DEP 1.1-1 to determine whether it meets the requirements in 10 CFR 52.7. This exemption would allow the applicant to provide an FSAR with numbering and topics more closely related to NUREG-0800 and RG 1.206. The staff finds that this administrative change of minor renumbering will not present an undue risk to the public health and safety and is consistent with the common defense and security. In addition, this exemption is consistent with the Atomic Energy Act and is authorized by law. Further, the application of the regulation in these particular circumstances is not necessary to achieve the underlying purpose of the rule. Therefore, the staff finds that the exemption to 10 CFR Part 52, Appendix D, Section IV.A.2.a, is justified. Finally, for the same reasons the staff is granting the exemption request, the staff also finds the departure from the numbering scheme in the Turkey Point COL FSAR to be acceptable.

#### Special nuclear material control and accounting program description

The material control and accounting (MC&A) program exemption request is similar to exemptions granted to other COL applicants for the Vogtle, Summer, Fermi, South Texas Project, and Levy COLs, and also proposed for Lee COLs. The applicable regulations in 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," and 10 CFR Part 74, "Material Control and Accounting of Special Nuclear Material," require that a special nuclear material license application describe an MC&A program and that the applicant establish, implement, maintain, and follow an MC&A program. These regulations contain an exclusion for licensees governed by 10 CFR Part 50 but not 10 CFR Part 52. The applicant noted that when reviewing the MC&A program there is no reason to treat reactors licensed under these two parts differently. The staff's reasoning in finding this exemption acceptable is the same as that used to address the corresponding exemption request considered in the South Texas Project, Units 3 and 4 COL review and is described in SECY-15-0123 (ADAMS Accession No. ML15316A408).

#### Maximum safety wet bulb (noncoincident) air temperature

The measured wet bulb temperature is a function of relative humidity and ambient air temperature and provides an indication of the amount of water vapor in the atmosphere. Wet bulb temperature measures the lowest temperature that can be reached by evaporating water into the air. Essentially, a higher wet bulb temperature means the air is not able to evaporatively cool a system as efficiently as when the wet bulb temperature is lower.

For this parameter, the applicant requested an exemption from the requirement of 10 CFR Part 52, Appendix D, Section IV.A.2.d, to include "information demonstrating compliance with the site parameters and interface requirements." The maximum safety wet bulb (noncoincident) air temperature listed in the AP1000 DCD is 86.1°F (30.1 °C). The maximum safety noncoincident wet-bulb temperature for Turkey Point Units 6 and 7 is 87.4 °F (30.8 °C), which is based on 100-year return estimates of 2-hour duration (i.e., 87.4 °F (30.8 °C), and is the maximum wet-bulb temperature that has a probability of occurring or being exceeded of 1 percent each year. This corresponds to an increase of 1.3 °F (0.7 °C) from the value listed in the AP1000 DCD. The staff's evaluation of the appropriateness of the 87.4 °F (30.8 °C) value is described in FSER Section 2.3.

The applicant analyzed the maximum safety wet bulb (noncoincident) air temperature of 87.4°F (30.8°C) for Turkey Point Unit 6 and 7. The staff reviewed the analyses and, although the increase in the temperature is small, the change impacted the systems listed below. As documented in the FSER, the staff concluded that the higher maximum safety wet bulb (noncoincident) air temperature will not adversely affect safety-related or defense-in-depth structures, systems, and components.

- Passive containment cooling system – Section 6.2 of the FSER.
- Control room habitability – Section 6.4 of the FSER.
- Normal residual heat removal system – Section 5.4 of the FSER.
- Component cooling water – Section 9.2.2 of the FSER.
- Spent fuel pool cooling system – Section 9.1.3 of the FSER.
- Central chilled water system – Section 9.2.7 of the FSER.

*Departures from AP1000 Design Control Document Revision 19*

The staff evaluated and found acceptable the applicant's proposed departures from information in AP1000 DCD Revision 19 presented in the table and text below. Part 7 of the COLA identifies the affected FSAR sections and provides a summary, justification, and evaluation of each departure.

The two departures designated in the table below as "STD" are standard for COL applicants adopting the AP1000 design. Of the remaining departures designated as "PTN," four departures are unique to the Turkey Point COLA. The other departures are common to multiple COLAs.

<b>Description</b>	<b>Location of Evaluation in FSER</b>
STD DEP 1.1-1. Administrative departure for organization and numbering for the FSAR sections.	1.5.4
PTN DEP 1.8-1. Correction of an inconsistency in regulatory citation in an interface description.	1.5.4
PTN DEP 2.0-1. Revision of operating basis wind speed	2.0.4
PTN DEP 2.0-2. Revision of maximum normal wet bulb (noncoincident) air temperature.	2.0.4
PTN DEP 2.0-3. Revision of maximum safety wet bulb (noncoincident) air temperature.	2.0.4
PTN DEP 2.0-4. Revision of population distribution exclusion area (site).	2.0.4
PTN DEP 3.2-1. Addition of downspouts and downspout screens to the condensate return portion of the passive core cooling system.	21.1
PTN DEP 3.11-1. Revision of "Envir. Zone" numbers for spent fuel pool level instruments.	3.11

Description	Location of Evaluation in FSER
PTN DEP 6.2-1. Revision of ITAAC acceptance criteria for the in-containment Passive Core Cooling System compartment vents to reflect the current plant configuration.	21.4
PTN DEP 6.3-1. Quantification of term “indefinitely” as used in the AP1000 DCD for maintenance of safe shutdown conditions using the passive residual heat removal heat exchanger during non-loss-of-coolant accidents.	21.1
PTN DEP 6.4-1. Revision of estimated maximum doses to control room operators to meet 10 CFR Part 50, Appendix A, General Design Criterion 19, “Control Room.”	21.2
PTN DEP 6.4-2. Revision of heat generated in the control room during accident conditions and the conditions for actuating the normal ventilation system supplemental filtration and the emergency ventilation system.	21.3
PTN 7.3-1. Modification of the engineered safety features to provide an operating bypass for the boron dilution block to meet the requirements of Institute of Electrical and Electronics Engineers Std. 603-1991 in accordance with 10 CFR 50.55a (h), “Protection and Safety Systems.”	21.5
STD DEP 8.3-1. Revision of Class 1E voltage regulating transformer current limiting features.	8.3.2
PTN DEP 18.8-1. Revision of operations support center location.	18.8.4
PTN DEP 18.8-2. Revision of technical support center location.	18.8.4
PTN DEP 19.58-1. Revision of description of severe winds and tornadoes.	19.58

PTN DEP 1.8-1 – This departure corrects an inconsistency in DCD Tier 2 Table 1.8-1 (Sheet 6 of 6), Item 13.1. This item references 10 CFR Part 50, Appendix O, for features that may affect plans for coping with emergencies as opposed to 10 CFR 52.137(a)(11). There is no change in substantive requirements, only a clarification of the reference to the applicable regulation. This departure does not require NRC approval.

PTN DEP 2.0-1 – This departure increases the operating basis wind speed of the site from 145 miles per hour (mph) (233 kilometers per hour (kph)) to 150 mph (241 kph). The staff reviewed this departure and determined that the applicant’s stated site characteristics are acceptable for the Turkey Point Units 6 and 7 site.

PTN DEP 2.0-2 – This departure changes the maximum normal wet-bulb (noncoincident) air temperature from 80.1°F (26.7 °C) to 81.5°F (27.5 °C), an increase of 1.4 °F (0.8 °C). The staff reviewed the departure and determined that the applicant’s stated normal safety wet-bulb (noncoincident) air temperature of 81.5 °F (27.5 °C) is appropriate for the Turkey Point Units 6 and 7 site.

PTN DEP 2.0-4 – This departure modifies the minimum distance from the source boundary to the exclusion area boundary to 0.27 mi (0.43 kilometers (km)) rather than the AP1000 DCD site parameter of 0.5 mi (0.80 km). The staff reviewed this departure and determined that the applicant's use of distances less than those provided in the AP1000 DCD would only result in more conservative (higher)  $\chi/Q$  estimates.

PTN DEP 3.11-1 – This departure corrects an inconsistency in a DCD table. The environmental zone numbers for three SFP level instruments are being revised to accurately reflect their actual location; the location of the SFP instruments are not being changed from the designed location. This departure does not require NRC approval.

STD DEP 8.3-1 – This standard departure involves the applicant's use of breakers and fuses to provide the isolation function instead of current limiting devices in Class 1E voltage regulating transformers. The staff previously evaluated and approved the same departure for the Vogtle and Summer COLAs, as indicated in the FSERs on those applications.

PTN DEP 18.8-1 – This departure addresses the location of the Operations Support Center (OSC). The referenced DCD states, "The ALARA briefing and operations support center is located off the main corridor immediately beyond the main entry to the annex building," and indicates that the OSC location is identified on Figure 1.2-18. For Turkey Point Units 6 and 7, the OSC is being moved, as described in the emergency plan, and one OSC will serve both Units 6 and 7 to optimize use of space and operational resources. The staff reviewed and approved this departure because the common OSC provides an area that meets the applicable regulatory guidance in NUREG-0696 and Supplement 1 to NUREG-0737 and as such, will allow the OSC to adequately support its intended emergency response functions.

PTN DEP 18.8-2 – This departure addresses the location of the TSC. The referenced DCD states, "The TSC is located in the control support area." This is not the case for Turkey Point Units 6 and 7. The TSC location is being moved to a central location as identified in the emergency plan, such that a single TSC can serve Units 3, 4, 6, and 7 to optimize use of space and operational resources. The staff reviewed and approved this departure because the common TSC provides an area that meets the applicable regulatory guidance in NUREG-0696 and Supplement 1 to NUREG-0737, except for the TSC distance from the Unit 6 and 7 control rooms, which the applicant has justified, and as such, the TSC will adequately support its intended emergency response functions.

PTN DEP 19.58-1 – For certain categories of high winds at Turkey Point Units 6 and 7, the initiating event frequency is higher than that in the AP1000 DCD. The staff reviewed this departure and determined that it does not alter the staff conclusion that high winds do not contribute to core damage. Accordingly, for the Turkey Point Units 6 and 7 high winds and tornado analysis, further risk assessment is not necessary.

The remaining departures are associated with the exemption requests described above:

- STD DEP 1.1-1 – COL application organization and numbering
- PTN DEP 2.0-3 – maximum safety wet bulb (noncoincident) air temperature
- PTN DEP 3.2-1 and PTN DEP 6.3-1 – Containment cooling changes in regards to passive core cooling system condensate return
- PTN DEP 6.4-1 – main control room dose
- PTN DEP 6.4-2 – main control room heatup

- PTN DEP 6.2-1 – combustible gas control in containment
- PTN DEP 7.3-1 – source range neutron flux doubling block permissive

A detailed discussion and justification for each exemption request is provided in Part 7 of the Turkey Point Units 6 and 7 COLA.

### III. Unique Facility Features or Novel Issues

#### *Safety Matters*

##### a. Storm Surge and Sea Level Rise

The controlling flood hazard for Turkey Point is the probable maximum storm surge (PMSS). The methods the applicant used to determine the Turkey Point PMSS are not unique, as they are consistent with approaches used to determine PMSS for other COLs and existing reactor sites. However, the Turkey Point PMSS analysis has been of particular interest to members of the public and governmental entities, due in part to the proposed facility's location in south Florida and its proximity to operating plants and two national parks (Biscayne Bay and the Everglades). There has also been stakeholder interest in understanding how the staff has evaluated the applicant's assumptions regarding the amount of future sea-level rise and how uncertainties in sea-level rise and other factors have been addressed.

Considering the amalgamation of conservative assumptions used in the PMSS analysis, the staff is confident that the PMSS analyses appropriately account for the uncertainty in all factors, including sea level projections. Moreover, while sea level rise is one parameter considered in establishing the flood level resulting from a storm surge, other factors are much more significant. The set of conservative assumptions incorporated into the applicant's analysis is described below.

First, consistent with guidance in NUREG-0800, the applicant's analysis used probable maximum hurricane (PMH) parameters from National Oceanic and Atmospheric Administration (NOAA) Technical Report NWS 23, "Meteorological Criteria for Standard Project Hurricane and Probable Maximum Hurricane Windfields, Gulf and East Coasts of the United States," to characterize a hypothetical hurricane for storm surge analysis. The analysis used the combination of PMH parameters that were found to result in the highest storm surge level. The combination of PMH parameters used modeled a hypothetical hurricane stronger than any hurricane ever observed in the Atlantic Ocean. The applicant then performed a deterministic simulation using the Sea, Lake, and Overland Surge from Hurricanes (SLOSH) model developed by NOAA.

Second, the applicant adjusted the storm surge level simulated by SLOSH by adding an additional 20 percent. The 20 percent is based on the uncertainty of SLOSH model predictions reported in NOAA Technical Report NWS 48, "SLOSH: Sea, Lake, and Overland Surges from Hurricanes." As shown by the NOAA data, for large storm surges, the SLOSH model used for the PMSS estimate is more likely to overpredict than underpredict storm surge, making this 20 percent adjustment particularly conservative.

Third, as recommended by NRC guidance, the applicant assumed that the antecedent water level at the time of peak storm surge coincided with a 10 percent exceedance high spring tide

(one of the highest 10 percent of the highest high tides for the locality) and included the highest value of sea level anomaly reported for the locality.

Fourth, the analysis assumed that the antecedent water level included a sea level rise of 1 ft. (0.3 meter (m)). This value for sea level rise over an assumed 60-year life of the plant was conservatively derived from nearby tide gauge data consistent with NRC guidance (ISG-JLD-2012-06) and the NOAA report, "Incorporating Sea Level Change Scenarios at the Local Level." Extrapolation of the gauge data yielded a sea level rise of 0.78 ft. (0.24 m) over 100 years, which was rounded up to 1 ft. (0.3 m) over the plant life for the analysis. This sea level rise value is based on NOAA's published linear trend for the Miami Beach data and no alternative trend fit to the Miami Beach or Key West historical data was more conservative than the 1 ft. (0.3 m) sea level rise used in the Turkey Point PMSS evaluation.

Fifth, the wave runoff added to the storm surge was based on an assumed maximum wind speed of 188.3 mph (303 kph), well above the 156 mph (251 kph) threshold for a Category 5 hurricane, resulting in straight-line constant winds of 159 mph (256 kph) towards the site at a height of 33 ft. (10 m). This is an additional conservatism, because normally these winds would not be expected to blow directly at the site without any attenuation in either wind speed or direction.

Using the assumptions described above, the PMSS analysis resulted in a calculated storm surge level of 24.8 ft. (7.6 m). Because the design plant grade proposed by the applicant is 26.0 ft. (7.9 m), there is an additional 1.2 ft. (0.4 m) of additional margin between the PMSS result and the final base level of the site.

Based on its independent review of the application, the staff concludes that the conservative assumptions incorporated in the applicant's PMSS analysis, considered together, result in a conservative estimate of PMSS. The staff also compared the applicant's PMSS result with historical data, including from Hurricane Andrew (the highest storm surge on record for the state of Florida), which resulted in a maximum of storm surge of 15.4 ft. (4.69 m) 10 miles north of the site and 3 to 4 ft. (0.9 to 1.2 m) at the site.

The staff's review of the applicant's analysis is documented in FSER Section 2.4.5. Based on examination and confirmation of the applicant's information the staff determined that the applicant's choice of methodology, assumptions, hurricane record data, and other characteristics in the PMSS analysis is appropriate for the analysis of PMSS at the Turkey Point Units 6 and 7 site.

The staff has received feedback from external stakeholders regarding estimates of regional sea level rise significantly higher than the 1 ft. (0.3 m) used in the applicant's analysis. These regional sea level rise estimates, however, are based in part on estimates of global sea level rise. Global sea level rise influences consist of various components including ocean circulation patterns and projected changes, ocean thermal expansion based on temperature projections, and glacial melt, with each of these components interdependent on one another. An additional layer of complexity is added by regional influences, which may include glacial isostatic adjustment, tectonics, and ocean/atmosphere dynamics. The staff notes that global and regional sea level rise projections incorporate significant uncertainties and should not be used as site-specific projections. Thus, the staff concludes the applicant is justified in using plausible values based on the historical record, modern day practices, staff guidance, and the regulations (e.g., General Design Criterion 2). Given the conservatisms applied to the PMSS, as described above, a 60 year sea level rise projection using recorded data is appropriate, particularly given

the conservative design basis PMSS flood level of 24.8 ft. (7.6 m) and a plant grade level of 26.0 ft. (7.9 m) (1.2 ft. (0.4 m) of additional margin).

Additionally, because sea level rise is a gradual and observable phenomena, the Commission has regulatory oversight mechanisms, such as future staff inspections requests for information (e.g., with a 50.54(f) letter), to account for changes in projected flood levels if necessary. The NRC staff continues to monitor evolving advances in external hazards science, including climate change, and will update regulatory guidance and take other regulatory actions, as needed.

#### b. Use of Deep Well Injection for Liquid Radioactive Waste Disposal

The applicant provided site-specific supplemental information in the Turkey Point Units 6 and 7 FSAR on the use of a nontraditional disposal method for NRC-licensed radioactive material in liquid effluents by deep well injection into the Boulder Zone (about 2900 ft. (883.9 m) below ground surface). By contrast, traditional liquid effluent disposal methods involve the direct discharge into surface waters, where the liquid effluent is diluted and dispersed in the receiving waters, and the potential dose to members of the public can be immediately analyzed. This method of deep well injection disposal would be the first used for a combined license or other operating reactor facility. However, deep well injection has been used for over 50 years in the State of Florida for disposal of industrial and municipal wastes and is permitted by the Florida Department of Environmental Protection (FDEP).

The applicant provided information on this alternative method of disposal of liquid radioactive waste in FSAR Sections 9.2.12 and 11.2.1.2.4. The applicant provided information to demonstrate compliance with 10 CFR 20.2002, "Method for Obtaining Approval of Proposed Disposal Procedures," since traditional disposal methods are to a surface body of water and the applicant is proposing the use of deep well injection. First, the applicant determined what radionuclides would be used in the analysis based on the largest contributors to dose. Second, the applicant provided demonstrably conservative groundwater modeling scenarios of both radial and vertical transport of effluents within and out of the Boulder Zone. This was used to determine the cumulative radionuclide inventory at the end of plant operations, or 61 years after startup of the first unit. Third, the applicant evaluated the scenarios which would produce the highest dose to potential receptors to demonstrate compliance.

The applicant's analysis used conservative parameters and assumptions to minimize travel time and maximize concentrations and the resulting dose at a hypothetical receptor at the closest possible offsite location (2.2 miles or 3.5 km). These conservative assumptions were that the peak concentrations of radionuclides occur at the same time at the hypothetical receptor well, that no dilution occurs within the Upper Floridan aquifer, and that injected effluent will bypass the Middle Confining Unit of the Floridan aquifer which separates the Boulder Zone from the Upper Floridan aquifer, where the hypothetical receptor well is located. The assumption of bypassing the confining unit effectively means that the concentrations present in the Boulder Zone beneath the hypothetical well location were used to calculate dose to an individual. This scenario assumed that water from the Boulder Zone is used for drinking water and irrigation.

The staff's review of this issue is described in Section 11.2 of the FSER. The staff typically approves 10 CFR 20.2002 requests that will result in a dose to a member of the public that is no more than "a few millirem/year." The basis for accepting the criteria of "a few millirem" is found in SECY-07-0060, "Basis and Justification for Approval Process for 10 CFR 20.2002 Authorizations and Options for Change," Attachment 1 (ADAMS Accession No. ML062050587) and in NUREG 1757, Volume 1, Revision 2, "Decommissioning Process for Materials

Licensees,” Section 15.12 (ADAMS Accession No ML063000243). The staff used the criteria in 10 CFR Part 50 Appendix I, “Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion ‘As Low As Is Reasonably Achievable’ for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents,” for evaluating dose because these criteria are used for evaluating dose for liquid effluent releases in calculating the doses to the maximally exposed individual for traditional surface water disposals.

First, the staff determined that the screening analysis used by the applicant was appropriate, and it verified the radionuclides by using the LADTAP II code. The staff verified that the four radionuclides selected by the applicant would account for 99 percent of the doses. Second, the staff performed a confirmatory analysis of the radial transport of effluents in the Boulder Zone and vertical transport of effluents through and out of the Boulder Zone. The staff determined that the applicant’s scenarios and related assumptions were conservative and that the resulting radionuclide concentrations at the hypothetical receptor location bounded the confirmatory results developed by staff. As a result, in the staff’s dose analysis, the staff used the effluent concentrations determined by the applicant. Third, the staff performed a dose analysis using the maximum concentrations at 2.2 miles (3.5 km) and determined that the doses calculated by the applicant were within the criteria of “a few millirem” by demonstrating the doses were within the dose objectives of 10 CFR Part 50, Appendix I. The staff concluded that the disposal of liquid radioactive waste as described in the FSAR meets the requirements of 10 CFR 20.2002 since the applicant adequately described the waste, performed an analysis that described the environment in which the effluent is transported, described the nature and location of potentially affected individuals and entities, and has also ensured the doses are maintained as low as is reasonably achievable by meeting 10 CFR Part 50, Appendix I and all other applicable NRC regulations.

### *Environmental Matters*

#### c. Cooling Water Sources

FPL’s primary source of cooling water for the proposed Turkey Point Units 6 and 7 would be reclaimed water from the Miami-Dade Water and Sewer Department South District Wastewater Treatment Plant (SDWWTP). The SDWWTP is located 9 miles (14.5 km) north of the Turkey Point site. The proposed Turkey Point Units 6 and 7 would take about 73 million gallons per day (MGD) (314 million liters per day (MLD)) of reclaimed water from the SDWWTP via a newly installed pipeline. To prepare it for use in the circulating water system (CWS), the reclaimed water would be further treated at FPL’s reclaimed water-treatment facility. The treated reclaimed water could be cycled through the circulating water system four times (four cycles of concentration).

The SDWWTP is currently injecting this water (the treated effluent or reclaimed water) at a rate of 97 MGD (367 MLD) into the Boulder Zone, the same formation FPL proposes to use for disposal. The estimated injection rate into the Boulder Zone at the Turkey Point site would be 18 MGD (68 MLD). Concentrations of constituents in reclaimed blowdown are listed in Table 3-5 of the EIS. As described above in the Background section on Adjudicatory Actions, the potential environmental impacts of injection of reclaimed water to the Boulder Zone is the subject of an admitted contention currently before the ASLB.

While the staff determined that the reclaimed water supply would be reliable for power generation operations, FPL has proposed a radial collector well system (RCW) as a backup cooling water source. Inclusion of the proposed backup cooling water source was solely FPL’s



decision for added power generation reliability. The CWS would be designed to accommodate 100 percent supply from reclaimed water (primary source), saltwater (backup source), or a combination of the two sources. No other nuclear plant (proposed or operating) has a backup water source for its cooling water use. In addition, reclaimed water as the primary source of cooling is used at only one other nuclear plant in the United States, the Palo Verde Nuclear Generating Station in Arizona.

When operated, the RCWs would extract saltwater from beneath Biscayne Bay via four radial collector wells installed off of the Turkey Point peninsula. Each well consists of a central caisson with several laterals (horizontal collector lines) extending up to 900 ft. (274 m) outward at depths of either 25 ft. (7.6 m) or 40 ft. (12 m) beneath the bay floor. Withdrawal from the wells would be at a maximum flowrate of 86,400 gallons per minute (about 124 MGD (469 MLD)). This is higher than for reclaimed water because this saltwater will only be cycled 1.5 times (compared to four times for the treated reclaimed water) through the plant. The RCWs would only be used when reclaimed water would not be available in sufficient quantity or quality and usage periods and amounts would be limited by the FDEP Conditions of Certification. In such circumstances, the injection rate into the Boulder Zone would be 83 MGD (314 MLD).

The staff considered three independent modeling studies in its assessment of the potential impacts to the hydrological environment as a result of operation of the RCWs. The modeling studies were all consistent in projecting insignificant alterations to both the Biscayne Bay and the underlying Biscayne Aquifer. The staff considered a wide range of baseline environmental conditions to reflect the uncertainty in the baseline environment due to various proposed actions associated with the industrial wastewater facility (IWF) used to support the existing units, climate change, and geo-hydrologic parameter uncertainty. While the environmental baseline may change significantly, the impacts to water quality and availability due to operation of the RCWs remains minor. Concentrations of constituents in saltwater blowdown are listed in Table 3-5 of the EIS. Injected blowdown would be denser and less buoyant than Boulder Zone water. As a result, upwelling is not expected.

#### d. Alternative Sites

When the staff reviews alternative sites, it typically uses the same cooling water system design at each of the alternative sites that was evaluated at the proposed site, to allow for an “apples-to-apples” comparison. However, this was not possible for the staff review for the Turkey Point COLA. The source of cooling water for the proposed site is reclaimed water from the City of Miami, but no such source of reclaimed water was available for the alternative sites. No other alternative sites could be found near enough to the Miami water source to make the use of that source practicable.

As a result, the applicant analyzed different approaches for cooling the plants at the alternative sites. For the St. Lucie site, the new plants would use water from the Atlantic Ocean through the existing plant intake. For the three inland sites, all situated around Lake Okeechobee, the applicant initially considered using surface water either flowing into or out of the lake. But the staff, based on its review and discussions with the South Florida Water Management District (SFWMD), concluded that obtaining water for the other three alternative sites in this manner was unlikely to be permitted by the water management authorities. Surface and groundwater in this region is heavily regulated by the state of Florida to meet Federal, State, Tribal, and local management and restoration goals. After extensive discussion with the NRC staff and the SFWMD, the applicant analyzed obtaining water through a combination of excess surface water (with a reservoir) and pumping groundwater from a deep (and saline) aquifer. The applicant

also analyzed the use of a desalination plant to reduce the salt content of the cooling water to protect nearby vegetation.

The staff concluded that it might be possible to cool the plants using excess surface water (without a reservoir) in combination with greater use of groundwater from the deep, saline aquifer. In addition, the staff concluded that the desalination plant might not be necessary. The staff therefore evaluated the three inland sites without the reservoir, and without the desalination plant. However, in the EIS the staff also acknowledged that there is significant uncertainty regarding how the cooling system might be implemented at any of these three sites. To appropriately account for this uncertainty, in addition to evaluating the environmental impacts of its version of the cooling system, the staff qualitatively assessed how those impacts would be different if a 3,000 acre reservoir was included in the design of the system. Based on that assessment, including the reservoir would increase the impacts on land use and terrestrial ecology, while also increasing in a minor way the impacts on aquatic ecology and surface-water use.

The staff's approach led to evaluating the potential impacts at these alternative sites under the most environmentally favorable circumstances. But even under these circumstances, the staff's analysis of impacts led to the conclusion that none of the alternative sites was environmentally preferable to the proposed site. It is possible, perhaps even likely, that the actual impacts at these sites would be greater than those evaluated in the EIS, reinforcing the staff's conclusion in the final EIS that none of the alternatives sites was obviously superior to the proposed site.

#### e. Critical Habitat

None of the recent new reactor application environmental reviews has involved a preferred site that contains Federally designated critical habitat for threatened or endangered species. The Turkey Point COLA is novel since it proposes to build Turkey Point Units 6 and 7 in an area designated under the Endangered Species Act as critical habitat for the threatened American crocodile (*Crocodylus acutus*). The NRC staff reviewed the applicant's project design and ongoing monitoring plans and, as indicated above, is consulting with the US FWS to determine the effects of construction and operation on the critical habitat and to the American crocodile population.

All of the proposed Turkey Point Units 6 and 7 plant area, and most of the nearby IWF is within the designated critical habitat for the American crocodile. Potential impacts include the permanent loss of approximately 270 ac of designated American crocodile critical habitat to accommodate proposed Turkey Point Units 6 and 7 and associated infrastructure, as well as adverse effects to approximately 211 ac of additional critical habitat resulting from relocation of soils and other solid material not suitable for reuse (assumed to be approximately 1.8 million yd<sup>3</sup> of muck) from the power block area to three disposal areas along upland berms of the IWF.

The staff's analysis concluded that the lost area represents only approximately 0.09 percent of the total crocodile terrestrial critical habitat available (270 ac out of 293,099 ac in South Florida). In addition, the annual monitoring and nesting surveys suggest that the proposed plant area located in the northeast portion of the IWF is generally considered to be low-quality crocodile habitat and is not actively used by crocodiles. With regard to impacts due to muck disposal on American crocodiles, the spoils areas identified in the IWF by the applicant were specifically selected because of their lack of suitable nesting substrate for crocodiles. Furthermore, the three spoils areas identified represent a very small percentage of berm habitat available for crocodiles in the IWF. The applicant has ongoing active crocodile monitoring and work

restrictions on the site as part of compliance with an existing Biological Opinion for Turkey Point Units 3 and 4, to minimize vehicle collisions with crocodiles and disturbance of nests. Therefore, although Turkey Point Units 6 and 7 would be constructed on designated critical habitat the staff believes that the US FWS will find that the construction and operation of Turkey Point Units 6 and 7 will not “jeopardize” the survival of the American crocodile nor will it result in adverse modification of designated critical habitat to the extent that it detrimentally affects the crocodile population.

#### IV. Findings

##### 10 CFR 52.97(a)(1)

- (i) *The applicable standards and requirements of the Act and the Commission’s regulations have been met.*

The staff reviewed the application and evaluated it against the applicable regulations in 10 CFR Parts 20, 26, 30, 31, 32, 40, 50, 51, 52, 55, 70, 73, 74, 100, and 140. The staff performed this evaluation using applicable portions of the SRP, ISG documents, regulatory guides, bulletins, and generic letters. Based on the staff’s review, documented in the FSER and the final EIS, and the conclusions of the ACRS, the staff concludes that, for the purpose of issuing COLs for Turkey Point Units 6 and 7, the applicable standards and requirements of the Atomic Energy Act of 1954, as amended, and the Commission’s regulations have been met.

- (ii) *Any required notifications to other agencies or bodies have been duly made.*

As required by Section 182c. of the Atomic Energy Policy Act of 1954, as amended, and 10 CFR 50.43(a), on August 23, 2016, the NRC notified the Public Service Commission of Florida of the Turkey Point Units 6 and 7 COLA (ADAMS Accession No. ML16182A212). In addition, in July 2008 the NRC published notices of the application in the *Total Leader* and *South Dade New Leader*. In accordance with Section 182c., the staff also published a notice of the application in the FR on November 18, November 25, December 2, and December 9, 2011 (76 FR 71608, 72725, 75566, and 77021).

Based on the staff’s completion of notifications to regulatory agencies and issuance of the public notices described above, the staff concludes that, for the purpose of issuing COLs for Turkey Point Units 6 and 7, all required notifications to other agencies or bodies have been duly made.

- (iii) *There is reasonable assurance that the facility will be constructed and will operate in conformity with the licenses, the provisions of the Act, and the Commission’s regulations.*

The staff reviewed information provided by the applicant to ensure that the plants will be constructed and will operate in conformity with the licenses, applicable provisions of the Atomic Energy Act of 1954, as amended, and applicable regulations. This includes the FSAR and other portions of the application, including general and financial information; TS; the emergency plan; requests for departures and exemptions; the Quality Assurance plan; and the security plan.

In areas where the staff found that the information submitted initially was incomplete or insufficient to allow the staff to reach a reasonable assurance conclusion, the staff issued RAIs to the applicant to obtain sufficient information. The staff reviewed applicant responses to ensure that the additional information provided was sufficient to support the staff conclusion. As necessary, the staff also conducted audits of the applicant's records and calculations and performed its own confirmatory calculations to confirm applicant statements.

In some cases, the staff's reasonable assurance finding required the imposition of license conditions or ITAAC as part of the licenses. The draft COL lists the license conditions, including license conditions for the squib valves, the Fukushima NTTF recommendations, and ITAAC. The basis for each license condition or ITAAC appears in the technical evaluations in the Turkey Point Units 6 and 7 COL FSER and the AP1000 DCD FSER referenced by the Turkey Point Units 6 and 7 COLA.

On the basis of the staff's review of the application discussed in this paper and documented in the FSER and final EIS, the staff concludes that, for the purpose of issuing COLs for Turkey Point Units 6 and 7, there is reasonable assurance that the facilities will be constructed and will operate in conformance with the licenses, the provisions of the Atomic Energy Act of 1954, as amended, and the Commission's regulations.

(iv) *The applicant is technically and financially qualified to engage in the activities authorized.*

The staff reviewed information provided by the applicant regarding technical and financial qualifications.

a. **Technical Qualification.** The staff reviewed information provided by the applicant regarding technical qualifications. The review included an evaluation of the applicant's operating experience, organizational structure, and Quality Assurance (QA) program. The applicant holds 10 CFR Part 50 licenses for St. Lucie Units 1 and 2 and Turkey Point Units 3 and 4 and has demonstrated its ability to build and operate a nuclear power reactor. The applicant has demonstrated the ability to choose and manage the oversight of nuclear steam supply system vendors, architect-engineers, and constructors of nuclear-related work. Thus, the NRC staff concludes that the applicant has the capability to subcontract, to procure, to schedule, and to manage the work associated with the detailed design (including licensing), procurement, and construction of Turkey Point Units 6 and 7. The staff's review of the applicant's organizational structure concluded that the management, technical support, and operating organizations are acceptable. The staff reviewed the QA program and found it acceptable.

The staff's evaluation of this information appears in Sections 1.4 and 13.1 and Chapter 17 of the FSER. Based on the staff's evaluation of the applicant's experience with licensing and operating a nuclear power plant, its operating organization, and its QA program, the staff finds that the applicant is technically qualified to hold a 10 CFR Part 52 license in accordance with 10 CFR 52.79(a)(1)(iv).

b. **Financial Qualification.** The staff reviewed information provided by the applicant about financial qualifications. The review included an evaluation of the financial

qualifications, decommissioning funding assurance, foreign ownership, control, or domination, and nuclear insurance and indemnity. The staff evaluated information pertaining to the total cost of Turkey Point Units 6 and 7, consisting of engineering, procurement, construction costs, owners' costs, financing costs, inflation, and information pertaining to funding sources for the owner. Applicable regulations and guidance considered by the staff included 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements"; 10 CFR 52.97(a)(1)(iv); 10 CFR 50.33; 10 CFR Part 50, Appendix C, "A Guide for the Financial Data and Related Information Required to Establish Financial Qualifications for Construction Permits and Combined Licenses," and NUREG-1577, "Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance."

The staff's evaluation of this information appears in Chapter 1 of the FSER. Based on the financial information provided by the applicant, the NRC staff concludes that the owner of Turkey Point Units 6 and 7 is not subject to financial qualifications for operations pursuant to 10 CFR 50.33(f)(2), has demonstrated that it possesses or has access to the financial resources necessary to meet estimated construction costs and related fuel cycle costs, and that there are no problematic decommissioning funding assurance issues, foreign ownership issues, or nuclear insurance and indemnity issues. Therefore, the NRC staff concludes that the applicant is financially qualified to construct Turkey Point Units 6 and 7 and to engage in the activities authorized by the licenses.

(v) *Issuance of the licenses will not be inimical to the common defense and security or to the health and safety of the public.*

The NRC staff reviewed the application to assure that issuance of the license will not be inimical to the common defense and security or to public health and safety. Specifically, the staff evaluated the applicant's analysis and conclusions about site-specific conditions, including the geography and demography of the site; nearby industrial, transportation, and military facilities; site meteorology; site hydrology; and site geology, seismology, and geotechnical engineering to ensure that issuance of the licenses will not be inimical to public health and safety. The review also evaluated the design of structures, components, equipment, and systems to ensure safe operation, performance, and shutdown when subjected to extreme weather, floods, seismic events, missiles (including aircraft impacts), chemical and radiological releases, and loss of offsite power to the extent not already resolved by the incorporation of the AP1000 design. The review confirmed that radiological releases and human doses during both normal operation and accident scenarios will remain within regulatory limits, which supports the staff's conclusion that issuance of the licenses will not be inimical to public health and safety.

The review determined that the security measures to be implemented at the site are adequate to protect the facility in accordance with NRC security regulations, which supports the staff's conclusion that issuance of the licenses will not be inimical to the common defense and security. Also, the staff is not aware of any information presenting inimicality or foreign ownership, control, or domination concerns. The applicant is based in the United States. FPL is a corporation organized and existing under the laws of the State of Florida. All members of the senior management and the Board of Directors for FPL are United States citizens.

The review also determined that operational programs identified by the applicant are sufficiently described to assure the staff of compliance with regulations. The NRC staff's evaluation addressed the operational programs identified in the SRM, dated February 22, 2006, on SECY-05-0197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria," as well as additional operational programs, including a cybersecurity program, and a program for handling special nuclear material (SNM), and an SNM transportation physical security program. The staff's review of the applicant's emergency planning information concluded that the emergency plan is acceptable and supports the staff's conclusion that issuance of the licenses will not be inimical to public health and safety.

On the basis of the staff's review of the application, as discussed in this paper and the referenced documents, the staff concludes that issuance of the COLs for Turkey Point Units 6 and 7 will not be inimical to the common defense and security or to public health and safety.

(vi) The findings required by Subpart A of Part 51 of this chapter have been made.

As discussed below, the staff concludes that, for the purpose of issuing COLs for Turkey Point Units 6 and 7, the environmental review has been adequate to support the findings set forth in 10 CFR 51.107(a).

10 CFR 52.97(a)(2):

The staff concludes that there are no acceptance criteria from ITAAC in the referenced standard design certification that the applicant has asserted are met. Therefore, no Commission finding under this section is required for the purpose of issuing COLs for Turkey Point Units 6 and 7.

10 CFR 51.107(a)

(i) Determine whether the requirements of Section 102(2) (A), (C), and (E) of the National Environmental Policy Act and the regulations in this subpart have been met.

The staff reviewed the application and evaluated it against the applicable regulations in 10 CFR Part 50, 10 CFR Part 51, 10 CFR Part 52, and 10 CFR Part 100. The staff performed this evaluation using applicable portions of NUREG-1555, issued in 2000 and updated in 2007, ISG documents, regulatory guides, and generic letters. The staff addressed supplemental guidance providing additional information on contemporary and evolving issues in a memorandum dated December 10, 2010 (ADAMS Accession No. ML100760503).

In accordance with NEPA Section 102(2)(A) (42 U.S.C. 4332(2)(A)), the staff prepared the final EIS (NUREG-2176) based on its independent assessment of the information provided by the applicant and information developed independently by the staff, including through consultation with other agencies. The staff's technical analysis used a systematic, interdisciplinary approach to integrate information from many fields, including both natural and social sciences.

In accordance with NEPA Section 102(2)(C)(i–v) (42 U.S.C. 4332(2)(C)(i–v)), the final EIS for the Turkey Point Units 6 and 7 COLs addresses (1) the environmental impact of the proposed action; (2) any unavoidable adverse environmental effects; (3) alternatives to the proposed action; (4) the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and (5) any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented.

As supported by correspondence presented in Appendices C and F to the final EIS, the staff concludes that it fulfilled the requirement of NEPA Section 102(2)(C) by consulting with and obtaining comments from other Federal agencies with jurisdiction by law or special expertise (see 42 U.S.C. 4332(2)(C)). USACE fully participated with the NRC in preparing this EIS as a cooperating agency and participated collaboratively on the review team under the Commission’s Memorandum of Agreement with USACE. Additionally, the National Park Service participated in the environmental review as a cooperating agency under a Memorandum of Understanding by providing special expertise for the areas in and around the adjacent national parks (Biscayne and Everglades National Parks).

The staff concludes that the final EIS demonstrates that the staff adequately considered alternatives to the proposed action to the extent that it involves unresolved conflicts concerning alternative uses of available resources, consistent with the requirements of NEPA Section 102(2)(E) (42 U.S.C. 4332(2)(E)). The alternatives considered in the final EIS include the no-action alternative, site alternatives, energy alternatives, system design alternatives, and mitigation alternatives for severe accidents.

For the reasons given above, the staff also concludes that its review comports with the NRC’s requirements in Appendix A, “Format for Presentation of Material in Environmental Impact Statements,” to 10 CFR Part 51. The staff concludes that environmental findings in the final EIS constitute the “hard look” required by NEPA and have reasonable support in logic and fact.

(ii) *Independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken.*

Section 10.6.3 of the final EIS provides the staff summary of the cost-benefit assessment. The staff concludes that “building and operating the proposed Units 6 and 7, with the anticipated mitigation measures identified by the review team, would have accrued benefits that most likely would outweigh the economic, environmental, and social costs. For the NRC-proposed action (NRC-authorized construction and operation) the accrued benefits would also outweigh the costs of construction and operation of Units 6 and 7.”

- (iii) Determine, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, whether the COL should be issued, denied, or appropriately conditioned to protect environmental values.

As noted above, in its final EIS, the staff considered the cost-benefit analysis, including the need for power, as well as reasonable alternatives. Based on that analysis, the staff recommends that the COLs be issued. The staff based its recommendation on (1) the Turkey Point Units 6 and 7 COLA environmental report; (2) consultation with Federal, State, Tribal, and local agencies; (3) the staff's independent review; (4) the NRC staff's consideration of public comments received on the environmental review; and (5) the assessments summarized in the final EIS, including the potential mitigation measures identified in the environmental report and in the final EIS. In addition, in making its recommendation, the staff determined that none of the alternative sites assessed is environmentally preferable or obviously superior to the Turkey Point site. The NRC staff also determined that none of the reasonable energy alternatives and none of the reasonable system design alternatives were environmentally preferable to those proposed.

The NRC's determination is independent of the USACE's determination of a "least environmentally damaging practicable alternative" under the Clean Water Act (CWA) Section 404(b)(1) guidelines and its required public interest review (PIR). The USACE's independent regulatory permit decision documentation referenced relevant analyses from the EIS and, as necessary, included a supplemental PIR; CWA Section 404(b)(1) evaluation; cumulative impact analysis; compensatory mitigation plan that is in accordance with 33 CFR Part 332, "Compensatory Mitigation for Losses of Aquatic Resources"; and other information and evaluations that may be outside the NRC's scope of analysis and not included in the final EIS, but that are required by the USACE to support its permit decision.

- (iv) Determine, in an uncontested proceeding, whether the NEPA review conducted by the NRC staff has been adequate.

The staff conducted an independent evaluation of the application; developed independent, reliable information; and conducted a systematic, interdisciplinary review of the potential impacts of the proposed action on the human environment and of reasonable alternatives to the applicant's proposal. Before developing the draft EIS, the staff issued a notice of intent to conduct scoping and invited public participation. The staff also provided opportunities for governmental and general public participation during the public meeting on the draft EIS and used publicly available guidance in the development of its final EIS.

The staff considered the purpose of and need for the proposed action, the environment that could be affected by the action, and the consequences of the proposed action, including mitigation that could reduce impacts. The final EIS considered the no-action alternative, energy alternatives, alternative sites, system design alternatives, and the potential impact of conservation measures in determining the demand for power and consequential need for additional generating capacity. The final EIS compared the alternatives to the proposed action. The staff considered any adverse environmental effects that could not be avoided should the proposed action be implemented, the



relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources that would be involved in the proposed project.

The NRC filed the draft EIS with the U.S. Environmental Protection Agency for its review consistent with the requirements of Section 309, "Policy Review," of the Clean Air Act (see 42 U.S.C. 7609). The staff received over 11,000 comment letters on the draft EIS. The staff considered all comments received on the draft EIS and, in Appendix E to the final EIS, together with a forthcoming supplement, describes the manner in which each comment was dispositioned.<sup>5</sup>

On these bases, the staff concludes that, for the purpose of issuing the COLs, it conducted a thorough and complete environmental review sufficient to meet the requirements of NEPA and adequate to inform the Commission's action on the COL request.

## V. Other Matters Not Tied to Specific Findings

### a. Severe Accident Management Guidelines

The staff identified an additional area of interest related to a recent Commission decision about the draft rule on mitigation of beyond-design-basis events (SECY-15-0065 (ADAMS Accession No. ML15049A213)). In the draft rule, the staff proposed to require implementation of severe accident management guidelines (SAMGs). In the associated SRM, the Commission approved publication of the draft rule for public comment subject to the removal of the proposed requirements for SAMGs (ADAMS Accession No. ML15239A767). As described below, the staff is proposing a license condition regarding SAMGs that is consistent with the Commission's decisions on the Vogtle, Summer, and Levy combined licenses. The staff is monitoring the development of the mitigation of beyond-design-basis events rule and will be prepared to make conforming licensing adjustments, as appropriate.

SAMGs were an industry initiative and remain voluntary for most licensees. However, the AP1000 design certification rule incorporates the AP1000 DCD, which specifies implementing the AP1000 severe accident management guidance on a site-specific basis. This is a condition of license for current AP1000 COLs (Vogtle Units 3 and 4, Summer Units 2 and 3, and Levy Units 1 and 2). For consistency within the AP1000 design center, one of the proposed license conditions for William States Lee Units 1 and 2 (discussed in SECY-16-0094) and Turkey Point Units 6 and 7 is the implementation of site-specific SAMGs.

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<sup>5</sup> Shortly after publication of NUREG-2176, the staff determined that 59 comment letters received within the comment period on the draft EIS were inadvertently not included and addressed in the final EIS. The staff has considered each of the comments in these letters and determined that each comment is either (1) identical or similar to other comments for which the staff included responses in Appendix E to the final EIS or (2) is not explicitly addressed in Appendix E but does not raise a significant environmental matter. For comments in the first category, the staff has identified one or more existing final EIS responses that address each comment. For the second category of comments, the staff has prepared written responses, none of which warrant changes to the analysis or conclusions in the main text of the final EIS. To address these comments and further the purposes of NEPA, the staff has prepared a supplement to NUREG-2176 under 10 CFR 51.92(c). The document is now publicly available on the NRC's website (ADAMS Accession No: ML16335A219). The supplement will be issued and distributed in accordance with 10 CFR 51.93(d). Since there are no changes to the proposed action and the comments do not provide new and significant information relevant to environmental concerns bearing on the proposed action or its impacts, 10 CFR 51.92(f) does not require that a request for comments accompany the supplement. Therefore, the staff does not plan to issue such a request.

COLs referencing other certified designs have addressed SAMGs differently. For example, the Economic Simplified Boiling Water Reactor (ESBWR) design certification rule incorporates the ESBWR DCD, which specifies that a severe accident management program will be developed by each COL holder that references the ESBWR DCD. Consequently, implementation of site-specific SAMGs is a condition of the Fermi license. On the other hand, the Advanced Boiling Water Reactor (ABWR) design certification rule incorporates the ABWR DCD, which specifies a COL action item. Applicants referencing the ABWR design must address procedures and training related to accident management. The COL for South Texas Project Units 3 and 4 (STP) references the ABWR design and includes a commitment to implement accident management in the STP FSAR (ADAMS Accession No. ML15124A421). The staff accepted this in the STP FSER and no license condition was proposed (ADAMS Accession No. ML15232A128).

b. State of Florida Conditions of Certification

On May 19, 2014, Florida's Governor and Cabinet, sitting as the Siting Board, issued a Final Order of Certification that approved FPL's application to construct and operate two new nuclear generating units at Turkey Point, as well as new electrical transmission lines and other offsite facilities. As part of this approval the Siting Board issued Conditions of Certification that provide specific terms, conditions, and requirements to govern non-radiological aspects of the construction, operation, and maintenance activities associated with the proposed new units.

The staff notes that on April 20, 2016, a Florida court issued an opinion in which it ruled that the Florida Siting Board should have considered whether to require FPL to bury a portion of the transmission lines, and that the record was inadequate to support certain mitigation measures associated with transmission lines in the East Everglades. Although the opinion remands the Conditions of Certification to the Florida Siting Board for consideration of the possibility of burying a portion of the transmission lines and reconsideration of the specified mitigation measures, the court's opinion was not yet final as of the date the final EIS became available in ADAMS (October 28, 2016). Accordingly, as stated in the final EIS, for the purposes of the final EIS evaluation of impacts, the staff considered the transmission line route and conditions reviewed and approved by the Florida Siting Board as the most current information regarding the transmission line and associated potential mitigation measures. The final EIS also states that even if the Conditions of Certification are revisited, the NRC staff considers it reasonable to expect that Conditions of Certification similar to or no less effective than those originally issued will be in place before construction and operation of the proposed units begins.

On November 22, 2016, the Florida court denied an FPL motion for rehearing, and as a result, the April 20, 2016, decision became final in accordance with its terms. The staff has considered these circumstances and determined that even if the Conditions of Certification are revisited on remand, it remains reasonable to expect that Conditions of Certification similar to or no less effective than those originally issued will be in place before construction and operation of the proposed units begins, as the NRC staff explained in the final EIS. Moreover, even in light of the remand, for the purposes of the final EIS evaluation of impacts, the transmission line route and conditions reviewed and approved by the Florida Siting Board remain the most current information regarding the transmission line and associated potential mitigation measures. In view of the foregoing, the NRC staff concludes that the November 2016 Florida court decision does not affect the staff analysis or conclusions set forth in the final EIS.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.

***/RA by Michael R. Johnson for/***

Victor M. McCree  
Executive Director  
for Operations

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.

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SECY-012

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