

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of

FLORIDA POWER & LIGHT CO.

(Turkey Point Nuclear Generating Units 6 and 7)

Docket Nos. 52-040-COL
52-041-COL

ORDER
(Setting Deadline for Proposed Transcript Corrections)

The Commission held an evidentiary hearing on December 12, 2017, at its Rockville, Maryland headquarters to receive testimony and exhibits in the uncontested portion of the captioned proceeding. The hearing transcript is appended to this Order. Pursuant to my authority under 10 C.F.R. § 2.346(a) and (j), the parties may file any proposed transcript corrections no later than January 9, 2018. The parties may coordinate their responses and file a joint set of corrections.

IT IS SO ORDERED.

For the Commission

NRC SEAL

/RA/

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 18th day of December, 2017.

Official Transcript of Proceedings
NUCLEAR REGULATORY COMMISSION

Title: Hearing on Combined Licenses for
Turkey Point, Units 6 and 7

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Tuesday, December 12, 2017

Work Order No.: NRC-3428

Pages 1-190

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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HEARING ON COMBINED LICENSES FOR TURKEY POINT,

UNITS 6 AND 7: SECTION 189A. OF THE

ATOMIC ENERGY ACT PROCEEDING

+ + + + +

TUESDAY,

DECEMBER 12, 2017

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Commission met in the Commissioners' Hearing Room at the Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, at 9:03 a.m., Kristine L. Svinicki, Chairman, presiding.

COMMISSION MEMBERS:

KRISTINE L. SVINICKI, Chairman

JEFF BARAN, Commissioner

STEPHEN G. BURNS, Commissioner

ALSO PRESENT:

ANNETTE VIETTI-COOK, Secretary of the Commission

MARGARET DOANE, General Counsel

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NRC STAFF:

FRANCIS AKSTULEWICZ, Director, Division of New
Reactor Licensing, Office of New Reactors

MANNY COMAR, Senior Project Manager, Office of New
Reactors

JENNIFER DIXON-HERRITY, Branch Chief, Licensing
Branch 4, Office of New Reactors

PEYTON DOUB, Biologist, Office of New Reactors

JOSEPH GIACINTO, Hydrologist, Office of New Reactors

ZACHARY GRAN, Health Physicist, Office of New
Reactors

MOHAMMAD HAQUE, Senior Hydrologist, Office of New
Reactors

ANDREW KUGLER, Senior Project Manager, Office of New
Reactors

DANIEL MUSSATTI, Office of New Reactors

VONNA ORDAZ, Deputy Director, Office of New Reactors

ELLEN SMITH, Hydrologist, Oak Ridge National
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SESHAGIRI TAMMARA, Office of New Reactors

ALICIA WILLIAMSON, Project Manager, Office of New
Reactors

MEGAN A. WRIGHT, Counsel for NRC Staff

1 APPLICANT REPRESENTATIVES:

2 STEPHAN FRANZONE, Licensing Manager, Florida Power &

3 Light Company

4 PAUL JACOBS, Engineering Supervisor, Florida Power &

5 Light Company

6 ANNE LEIDICH, Counsel for Florida Power & Light

7 Company Staff

8 WILLIAM MAHER, Senior Licensing Director, Florida

9 Power & Light Company

10 MANO NAZAR, President, Nuclear Division and Chief

11 Nuclear Officer, Florida Power & Light Company

12 RICHARD ORTHEN, Licensing Engineer, Florida Power &

13 Light Company

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P R O C E E D I N G S

9:03 a.m.

1
2
3 CHAIRMAN SVINICKI: Good morning,
4 everyone. I call this hearing to order and a good
5 morning.

6 And, there's a wonderful number of people
7 in the room and a great energy, so we're going to have
8 a good hearing today.

9 I want to welcome the Applicant, Florida
10 Power and Light, or FPL, the NRC staff, members of the
11 public in the room with us and those who are observing
12 remotely.

13 The Commission convenes today to conduct
14 and evidentiary hearing on FPL's application for
15 Combined Licenses to construct and operate two new
16 nuclear power plants at the existing Turkey Point site
17 in Miami-Dade County, Florida.

18 This hearing is required under Section
19 189(a) of the Atomic Energy Act of 1954 as amended.

20 The Commission will also be reviewing the
21 adequacy of the NRC staff's environmental impact
22 analysis under the National Environmental Policy Act
23 of 1969, or NEPA.

24 The general order of today's hearing is as
25 follows.

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1 First, I will address procedural matters
2 associated with the swearing in of witnesses and the
3 admission into the record of the parties' exhibits.

4 FPL and the NRC staff will then provide
5 testimony in witness panels that provide an overview
6 of the application as well as address safety and
7 environmental issues associated with its review, with
8 Commission questions following each panel.

9 The Commission expects to issue a decision
10 after the hearing promptly with due regard to the
11 complexity of the issues after it makes the following
12 necessary findings.

13 On the safety side, the Commission will
14 determine, one, whether the applicable standards and
15 requirements of the Atomic Energy Act and the
16 Commission's regulations, specifically those in 10 CFR
17 Section 52.97 have been met.

18 Two, whether any required notifications to
19 other agencies or bodies have duly been -- been duly
20 made.

21 Three, whether there is reasonable
22 assurance that the facility will be constructed and
23 will operate in conformity with the licenses, the
24 provisions of the Atomic Energy Act and the NRC's
25 regulations.

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1 Four, whether the Applicant is technically
2 and financially qualified to engage in the activities
3 authorized.

4 And, five, whether issuance of the
5 licenses would be inimical to the common defense and
6 security or to the health and safety of the public.

7 On the environmental side, as noted in 10
8 CFR Section 51.07(a), the Commission will determine
9 whether the requirements of the National Environmental
10 Policy Act, Section 102(2)(a)[©] and (e) and the
11 applicable regulations in 10 CFR Part 51 have been
12 met.

13 Second, we will independently consider the
14 final balance among conflicting factors contained in
15 the record of the proceeding with a view to
16 determining the appropriate action to be taken.

17 Third, we will determine, after weighing
18 the environmental, economic, technical and other
19 benefits against environmental and other costs and
20 considering reasonable alternatives, whether the
21 Combined Licenses should, on the basis of the
22 environmental review be issued, denied or
23 appropriately conditioned.

24 And, fourth, determine whether the NEPA
25 review conducted by the NRC staff has been adequate.

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1 This meeting is open to the public and we
2 do not anticipate the need to close the meeting to
3 discuss nonpublic information. If a party believes
4 that the response to a question may require a
5 reference to nonpublic information, then that party
6 should answer the question to the extent practicable
7 with information in the publically available record
8 and file any nonpublic response promptly after the
9 hearing on the nonpublic docket.

10 I will now ask my fellow Commissioners
11 whether they have any opening remarks for today's
12 mandatory hearing. We've done a few of these as a
13 group.

14 (NO RESPONSE)

15 CHAIRMAN SVINICKI: So, okay.

16 So, we will now proceed to the swearing in
17 of witnesses and we will begin with FPL. So, counsel
18 for FPL, would you please introduce yourself?

19 MS. LEIDICH: I'm Anne Leidich with the
20 firm Pillsbury Winthrop Shaw Pittman.

21 CHAIRMAN SVINICKI: I think you might have
22 turned it off. Okay, thank you.

23 MS. LEIDICH: I'm Anne Leidich with the
24 firm Pillsbury Winthrop Shaw Pittman and I have the
25 pleasure of representing Florida Power and Light

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1 Company.

2 CHAIRMAN SVINICKI: Thank you.

3 So, I would ask you now to read the names
4 of FPL's witnesses and each witness should stand as
5 her or his name is read and please remain standing.

6 MS. LEIDICH: Mano Nazar, William Maher,
7 Stephan Franzone, Paul R. Jacobs and Richard F.
8 Orthen.

9 CHAIRMAN SVINICKI: Okay, thank you.

10 I will ask you now to please raise your
11 right hand while I read the oath.

12 Do you swear or affirm that the testimony
13 you will provide in this proceeding is the truth, the
14 whole truth and nothing but the truth?

15 (CHORUS OF I DO)

16 CHAIRMAN SVINICKI: Thank you.

17 Are there any witnesses of the witnesses
18 standing who did not take the oath?

19 (NO RESPONSE)

20 CHAIRMAN SVINICKI: Hearing none. Are
21 there any objections to including the witness list as
22 part of the record?

23 MS. WRIGHT: None from staff.

24 CHAIRMAN SVINICKI: Okay, thank you.

25 In the absence of objections, the witness

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1 list is admitted into the record and the witnesses may
2 seat.

3 Thank you.

4 For FPL counsel, we will now turn to FPL's
5 exhibits. Counsel, I would first ask, are there any
6 changes to your exhibit list?

7 MS. LEIDICH: No, there are not.

8 CHAIRMAN SVINICKI: Please read the range
9 of numbers of the exhibits to be admitted.

10 MS. LEIDICH: FPL-001 to FPL-010.

11 CHAIRMAN SVINICKI: Is there a motion to
12 admit the exhibits into the record?

13 MS. LEIDICH: Yes, there is.

14 CHAIRMAN SVINICKI: Are there any
15 objections to the admission of the exhibits and the
16 exhibit list as part of the record?

17 MS. WRIGHT: No objections.

18 CHAIRMAN SVINICKI: In the absence of
19 objections, the exhibits and exhibit list are admitted
20 into the record.

21 I now turn to the NRC staff counsel for
22 the presentation of the NRC staff's witnesses,
23 counsel, please introduce yourself.

24 MS. WRIGHT: Hi, I'm Megan Wright, counsel
25 for NRC staff. We have quite a bit more witnesses

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1 than FPL.

2 CHAIRMAN SVINICKI: Those of us who have
3 been here before understand this will take a little
4 bit longer.

5 So, I will now ask NRC counsel to please
6 read the names of the staff witnesses. Each witness
7 should stand as her or his name is read and please
8 remain standing.

9 MS. WRIGHT: Frank Akstulewicz, Clinton
10 Ashley, Dan Barss, Laurel Bauer, Anthony Bowers,
11 Lawrence Burkhardt, Robert Caldwell, Anthony Campbell,
12 Nan Chien, Manny Comar, Christopher Cook, David
13 Curtis, Thinh Dinh, Jennifer Dixon-Herrity, Michael
14 Dudek, Robert Fitzpatrick, John Frost, Joseph
15 Giacinto, Zachary Gran, Michelle Hart, Brad Harvey,
16 Shawn Harwell, David Heeszal, Shana Helton, John
17 Honcharik, Diane Jackson, Kerri Kavanagh, Taylor Lamb,
18 Tuan Le, Mark Lintz, Kosmas Lois, Timothy Lupold, Greg
19 Makar, Tania Martinez Navedo, Matthew Mitchell, John
20 Monninger, Bruce Musico, Ryan Nolan, Vonna Ordaz,
21 Donald Palmrose, Pravin Patel, Malcolm Patterson, Tom
22 Pham, Kevin Quinlan, Sheila Ray, Sujit Samaddar, Ellen
23 Smith, Angelo Stubbs, Edward Stutzcage, Emil Tabakov,
24 Seshagiri Tammara, Robert Taylor, Theodore Tjader,
25 Richard Turttil, Yuken Wong, Zuhan Xi, Jack Zhao,

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1 Daniel Barnhurst, Jack Cushing, Jennifer Davis, J.
2 Peyton Doub, Kenneth Erwin, Mohammad Haque, Stacey
3 Imboden, Andrew Kugler, Ann Miracle, Daniel Mussatti,
4 Kevin Quinlan, Lance Vail and Alicia Williamson.

5 CHAIRMAN SVINICKI: Thank you.

6 And, I can generally see most of you.
7 There may be a couple of witnesses that are blocked a
8 little bit by the pillars. Maybe if you would move
9 off to one side or the other so I can cast my gaze on
10 you while I read the oath.

11 So, please, for all the NRC staff
12 witnesses, would you raise your right hand while I
13 read the oath?

14 Do you swear or affirm that the testimony
15 you will give -- provide in this proceeding is the
16 truth, the whole truth and nothing but the truth?

17 (CHORUS OF I DO)

18 CHAIRMAN SVINICKI: Are there any
19 witnesses who did not take the oath?

20 (NO RESPONSE)

21 CHAIRMAN SVINICKI: Okay, hearing none.
22 Are there any objections to including the witness as
23 part of the record?

24 MS. LEIDICH: No, there are not.

25 CHAIRMAN SVINICKI: In the absence of

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1 objections, the witness list is admitted to the
2 record.

3 The witnesses may please take their seats
4 again.

5 Thank you very much.

6 We will now turn to the NRC staff's
7 exhibits. Counsel, are there any changes to your
8 exhibit list?

9 MS. WRIGHT: No, there are not.

10 CHAIRMAN SVINICKI: Please read the range
11 of numbers of the exhibits to be admitted.

12 MS. WRIGHT: NRC-001 to NRC-011.

13 CHAIRMAN SVINICKI: Is there a motion to
14 admit the exhibits into the record?

15 MS. WRIGHT: Yes, there is.

16 CHAIRMAN SVINICKI: Are there any
17 objections to the admission of the exhibits and the
18 exhibit list into the record?

19 MS. LEIDICH: No, there are not.

20 CHAIRMAN SVINICKI: In the absence of
21 objections, the exhibits and exhibit list are admitted
22 into the record.

23 Okay, thank you, counsel.

24 That is -- we've disposed of those
25 important matters very capably, so I ask now that

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1 we're going to turn to the first of the witness panels
2 and the counsel may be excused at this point. Thank
3 you.

4 MS. LEIDICH: Thank you.

5 MS. WRIGHT: Thank you.

6 CHAIRMAN SVINICKI: So, as I noted earlier
7 in the order of the day, we will now begin with two
8 separate overview panels.

9 The first of those will be provided by the
10 FPL witness and they will provide an overview of FPL's
11 application.

12 After each overview panel, we will have a
13 round of questions from the Commissioners.

14 For the two subsequent presentations, the
15 safety panel and the environmental panel, first, FPL
16 and then the staff will testify followed by an
17 opportunity for the Commission to pose questions to
18 both parties.

19 The Commissioners will have an opportunity
20 to bank their time as they see fit to focus on
21 particular questions over the course of the day. And,
22 as is our practice, we will rotate the order of
23 questioning throughout the day.

24 I remind all witnesses of this panel and
25 other panels who will appear before us throughout the

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1 day that they remain under oath and that the
2 Commission is also familiar with your prehearing
3 filings.

4 And, I will note, I don't think it will
5 happen for this overview FPL panel, but if a witness
6 or individual should need to come to the podium to
7 respond to a question or otherwise speak, please
8 approach the podium and wait to be addressed and to be
9 sworn in if you have not previously been sworn in.

10 So, with that opening, I would ask the FPL
11 panelists for the overview panel to please introduce
12 themselves and then proceed with the presentations.

13 Thank you.

14 MR. NAZAR: Good morning, Commissioners.
15 My name is Mano Nazar. I'm the president of the --
16 and Chief Nuclear Officer of the Florida Power and
17 Light and its parent company, NextEra Energy.

18 I'm very pleased to appear before you
19 today on the issuance of the Combined Construction
20 Permit and Operating License for Turkey Point 6 and 7.

21 Before I start, I would like to recognize
22 the significant work put forth by the NRC staff in
23 reviewing our application and the diligent work of all
24 employees at the FPL supporting that review.

25 I know that the NRC staff has totally

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1 analyzed our application, demonstrating that the
2 construction and operation of the Turkey Point 6 and
3 7 would be consistent with the NRC mandate to protect
4 the public safety and health.

5 Staff also has performed a detailed review
6 of the environmental impacts associated with the
7 project.

8 Now, let me talk a little bit about the
9 FPL, if we could change to slide number two.

10 FPL is one of the largest rated regulated
11 electric company, electric utility in the United
12 States. It serves approximately about 10 million
13 people, to 4.9 million customer accounts in Florida.

14 Florida Power and Light service
15 reliabilities is better than 99.98 percent which ranks
16 among the best nationwide.

17 FPL also high fuel efficient power plant
18 fleet is one of the cleanest among the utility
19 nationwide.

20 The typical customer bill is 30 percent
21 lower than national average and the lowest residential
22 bill in Florida.

23 As I mentioned, FPL is wholly owned
24 subsidiary of the NextEra Energy. NextEra Energy, a
25 little about the company as a whole, the parent

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1 company of the FPL, Florida Power and Light and also
2 NextEra Energy resources, is based on the market cap,
3 the largest electric company in the world.

4 NextEra Energy is the leading clean energy
5 company with consolidated revenues of approximately
6 \$16.2 billion.

7 Over 45,000 megawatt generation capacity
8 and approximately 14,270 employees in 30 states and
9 Canada as of end of the 2016.

10 In addition to FPL, NextEra Energy and
11 other principle subsidiaries, NextEra Energy
12 resources, as I mentioned earlier, which is the
13 world's largest generator of the energy from the wind
14 and the sun.

15 Two, it's a fairly adept entity is NextEra
16 Energy resources owns and operates three nuclear power
17 plants, four units, Seabrook Nuclear Power Plant,
18 Point Beach Nuclear Power Plant and Duane Arnold.

19 Let's go to slide three.

20 I want to talk a little bit about the
21 nuclear fleet within the NextEra Energy.

22 NextEra Energy nuclear fleet has extensive
23 experience with nuclear power plants. And, FPL is
24 well-qualified to construct and operate Turkey Point
25 6 and 7.

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1 NextEra Energy nuclear fleet is one of the
2 largest in the country with 8 units at five different
3 sites representing approximately about 6 percent of
4 the U.S. nuclear power electric generation capacity.

5 And, it accounts for about a quarter -- 25
6 percent of the NextEra Energy total generation.

7 FPL, on the FPL side, we operate 4 units,
8 two units at St. Lucie Nuclear sites and 2 units at
9 Turkey Point with a total net generation of about
10 approximately about 3,500 megawatts.

11 The investment to build these units in
12 60s, 70s and 80s resulted in significant value to the
13 FPL customers in terms of safe, reliable, clean, cost-
14 effective, base load energy and is one of the reasons
15 why FPL is leading in the low-cost reliable and clean
16 electricity today.

17 Turkey Point and St. Lucie accounted for
18 nearly about 25 percent of the FPL generation in 2016.

19 As I mentioned previously, FPL affiliated
20 NextEra Energy resources also owns and operates at
21 Seabrook, Point Beach and Duane Arnold plants.
22 Together, that NextEra nuclear fleet the capacity to
23 generate more than 6,500 megawatts of the emission-
24 free electricity, enough to supply the needs of nearly
25 about 5 million households.

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1 NextEra takes its commitment to protect
2 the health and safety of the public very seriously.
3 The operational performance of the NextEra Energy
4 nuclear fleet reflects strong nuclear safety and
5 reliability record.

6 NextEra's top priority remains to provide
7 safe and reliable generation and has maintained the
8 safety and reliability of its nuclear fleet by
9 following our core principle which is defined in our
10 nuclear excellence model.

11 Over the past decade, the FPL successfully
12 completed extended power operating projects at both
13 St. Lucie, two units at St. Lucie and two units at
14 Turkey Point, four units.

15 In addition, at NextEra Energy resources
16 also the power operate was implemented at two units of
17 Point Beach, I mentioned earlier.

18 At FPL, those operates provided
19 approximately about 530 megawatts of the additional
20 nuclear capacity. All together approximately about
21 750 megawatts within the NextEra Energy at six units,
22 two Point Beach units, two St. Lucie and two Turkey
23 Point.

24 Today, FPL's customers are benefitting
25 from lower fuel costs and reduced system emissions

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1 provided by this additional nuclear capacity.

2 Similarly, a Combined License for Turkey
3 Point 6 and 7 would be particularly valuable to FPL.
4 It would provide an option for new carbon-free power
5 to Florida clean energy portfolio that would help to
6 maintain system reliability.

7 And, also provides fuel diversity and
8 protect against price volatility.

9 At this time, the best path forward for
10 FPL is to preserve all of its options to meet future
11 demand, including Units 6 and 7.

12 I will now turn the presentation over to
13 Bill Maher to my left who is the Senior Licensing
14 Director, New Nuclear Projects and to Steve Franzone,
15 New Nuclear Projects Licensing Manager who will
16 provide an overview of the proposed units and their
17 licensing.

18 MR. MAHER: Good morning, Commissioners.
19 I'm Bill Maher, Senior Director of Licensing and New
20 Nuclear for Florida Power and Light.

21 I want to begin by echoing the sentiments
22 you just heard and thank the NRC, especially the NRC
23 staff for its diligence in conducting a through review
24 of our application.

25 Likewise, I want to recognize the current

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1 and former members of our FPL team who have worked
2 tirelessly over the past several years to reach this
3 point.

4 As you are well aware, the work required
5 to get to this hearing is very challenging and we are
6 very pleased to have the opportunity to discuss our
7 Turkey Point COL application with you.

8 The development of the Turkey Point COLA
9 has presented some unique challenges and learning
10 experiences for us in applying the Part 52 licensing
11 process.

12 Our presentations today will focus on the
13 safety and environmental aspects that are unique to
14 Turkey Point.

15 We selected the AP1000 as our design for
16 a variety of reasons, chief among them being the
17 passive safety features and our familiarity with PWR
18 technology.

19 The opportunity to collaborate with other
20 utilities in the southeast who also chose and are
21 constructing the AP1000 design offers significant
22 advantages and we have benefitted from this
23 collaboration.

24 We have been following the experiences at
25 Vogtle and Summer over the past year with great

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1 interest and will continue to monitor the ongoing
2 progress at Vogtle to ensure we can leverage their
3 experience.

4 Issuance of the COL would provide FPL with
5 a valuable option to meet future generation needs.
6 Although we have not made a final decision to build,
7 the ability to add emission-free nuclear generation in
8 Florida is an important element in our integrated
9 resource planning.

10 Our integrated resource plan which is
11 annually updated and filed with the Florida Public
12 Service Commission projects significant growth in
13 electric demand over the next ten years.

14 Slide number four, please?

15 Once FPL began its consideration of new
16 nuclear, we engaged in a robust and comprehensive site
17 selection process, evaluating alternative sites and
18 completing extensive site characterization at Turkey
19 Point.

20 As part of Florida's site certification
21 process, numerous public outreach sessions were held
22 to solicit public input into options for transmission
23 line routing.

24 The plant site has excellent placement
25 within our transmission system and has been approved

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1 by the State of Florida.

2 Florida's unique geography with its
3 largest metropolitan area near the southern end of a
4 peninsula present challenges for transmission planning
5 and large generating facilities that must be located
6 with adequate foresight.

7 FPL's site selection study looked at its
8 entire service territory with a special focus on areas
9 that would serve the Miami Load Center.

10 FPL did not identify any alternative site
11 that was obviously superior.

12 Our COL application, the NRC staff's final
13 safety evaluation report and the NRC's final
14 environmental impact statement fully support each of
15 the Commission's findings required for issuance of the
16 COL.

17 In summary, FPL believes it is well
18 positioned to construct, own and operate an additional
19 nuclear facility.

20 We have the operational experience to make
21 Turkey Point project a success. Our staff of proven
22 nuclear professionals will ensure safe, reliable,
23 economic and environmentally sound operation at the
24 Turkey Point facility.

25 At this point, I would like to introduce

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1 the rest of our presenters for today's hearing.

2 Steve Franzone to my left has over 38
3 years of industry and Navy nuclear experience in plant
4 operations, licensing, engineering and major projects.
5 He is responsible for the licensing at Turkey Point.

6 Paul Jacobs, Paul has worked in the
7 nuclear industry for over 40 years with experience in
8 design and plant engineering. He is responsible for
9 engineering support of the Turkey Point project.

10 Rick Orthen, Rick has worked in the
11 nuclear industry for over 38 years with experience in
12 radiation protection and environmental support of
13 plant operations. He is responsible for environmental
14 support and required for Turkey Point licensing and
15 permitting.

16 Thank you for your time and attention.
17 And, I'll turn it over to Steve Franzone to provide
18 overview of site and licensing activities.

19 MR. FRANZONE: Slide five, please?

20 Thank you, Bill, and good morning,
21 Commissioners.

22 This is Steve Franzone. I would like to
23 give the Commission a brief overview of the Turkey
24 Point 6 and 7 site.

25 This is a map of south Florida area and it

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1 shows the Turkey Point location relative to Miami.
2 The site is located in southeastern Miami-Dade County
3 and is approximately 25 miles south of Miami.

4 On the east side of the site are Biscayne
5 Bay and Biscayne National Park. To the west of the
6 site are the two closest cities, Homestead and Florida
7 City. And, further west, you'll find Everglades
8 National Park.

9 The site is eight miles east of Florida
10 City and nine miles south-southeast of Homestead.

11 The closest primary public roads are US
12 Highway 1 and the Homestead Extension of the Florida
13 Turnpike.

14 The site is typically accessed from Palm
15 Drive which is also known as Southwest 344th Street
16 which runs directly east/west from the site to Florida
17 City.

18 Slide six, please?

19 FPL proposes to locate its two 1,100
20 megawatt electric AP1000 units on an approximately 218
21 acre island area located within the existing
22 industrial waste water facility.

23 This industrial waste water facility
24 contains the cooling panels that are associated with
25 the existing units.

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1 The site is permanent on limestone site
2 with alternating layers of silty sand. For associated
3 facilities such as the reclaim water treatment
4 facility and the radial collector wells, where
5 possible, wetland impacts were avoided and minimized
6 by selecting previously impacted areas and
7 environmentally sensitive engineering. I will talk
8 about those plant features shortly.

9 As you can see in the picture, the current
10 grade at the nuclear island is near sea level. During
11 construction, it will be raised to an elevation of 26
12 feet to accommodate storm surge and wave run up
13 heights.

14 The major site preparations include
15 removal of the top layer of the island which ranges
16 from 3 to 11 feet and building a mechanically
17 stabilized earth wall.

18 One of our goals while performing this
19 work will be eroding interactions with existing units
20 in the operation at the site.

21 Next slide, please?

22 Planning 6 and 7, FPL was able to take
23 advantage of existing well-established technologies in
24 order to not only minimize our impact to the
25 surrounding environment, but also to help governments

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1 with environmental compliance.

2 As you are aware, we are proud to have
3 been able to work out an agreement with Miami-Dade
4 County for the use of reclaimed water as a primary
5 source of cooling water for Unit 6 and 7. This will
6 help the county meet mandated water use requirements.

7 Many examples of the beneficial use of
8 reclaimed water exist in various industries including
9 power generation. This resource has been used
10 successfully at Palo Verde.

11 In the event this reclaimed water is not
12 available in the quantity or the quality that we need,
13 radial collector wells will serve as a back up source
14 of cooling water.

15 Again, this is a well-established
16 technology used for many different purposes including
17 power generation.

18 Extensive ground water modeling has been
19 performed to demonstrate that all these wells will
20 have minimal impacts to the surface water.

21 If you look at the photo on the right hand
22 side of this, you'll see -- on the right hand side of
23 the slide, you'll see the actual Turkey Point from
24 which the site took its name.

25 The radial collector wells will be

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1 installed here on the point and extend laterally
2 underneath Biscayne Bay. Paul Jacobs will go into
3 further detail about the construction and operation of
4 both the reclaimed water and the radial collector
5 wells during the safety and environmental panels.

6 Slide eight, please?

7 I will now point out a few of the features
8 to assist in the construction and operation of the
9 facility.

10 Construction laid out is within the
11 industrial waste water facility. We will construct an
12 onsite facility to treat the reclaimed water to meet
13 the requirements for use in a nuclear plant and
14 cooling towers.

15 Location of the reclaimed water treatment
16 facility was selected to optimize the routing of the
17 reclaimed water pipelines and minimize associated
18 wetland impacts.

19 Working with Miami-Dade County, FPL moved
20 the proposed facility to this location in an effort to
21 reduce wetland impacts.

22 As to the radials, the existing road to
23 the radial collector well will be used. No widening
24 of the existing access road to the Turkey Point
25 peninsula is proposed.

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1 Other features include separate
2 construction access roads, barge slip improvements as
3 well as the installation of a heavy haul path using
4 existing roadways.

5 Slide nine, please?

6 Okay, so, for this figure, the south is on
7 the bottom on the figure.

8 So, we'll start -- and then if you wanted
9 to know where 3 and 4 was, above and slightly to the
10 right outside the figure would be the Units 3 and 4,
11 just to kind of give you a feel for where we're at.

12 So, we'll start from the south and work
13 our way up. And, just above the bottom of the
14 photograph, you'll see the light blue area which is
15 actually the make up water reservoir and that has
16 about a three day supply or reclaimed water for
17 cooling water for the units.

18 Within the makeup cooling water reservoir,
19 you'll find the mechanical draft cooling towers, three
20 per unit. Okay? And then, right above that, you'll
21 see these little orange boxes with the dot in the
22 middle, okay, those are our underground injection
23 wells. And, those are for effluent and blow down
24 disposals. And, Paul will be talking about those,
25 too, later on.

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1 Next, you'll find Unit 6 and 7, it's a
2 standard layout. Unit 6 is on the right hand side,
3 Unit 7 is on the left hand side. And then, right
4 above that, you'll see the Clear Sky Substation on the
5 left and then parking and other facilities on the
6 right.

7 Okay, slide ten, please?

8 Okay, so, as a point of reference, this
9 view would be looking north from Unit 6 and 7. Let's
10 talk about the history of the site.

11 Construction on the site started in 1965
12 with the two original fossil units. Construction on
13 the first nuclear unit started in 1967 when the AEC
14 granted the construction permit for Units 3 and 4.

15 Units 3 and 4 commenced commercial
16 operation in 1972 and 1973 respectively.

17 The first American crocodile was found in
18 the cooling canals in 1976.

19 One of the milestone events which impacted
20 not only the site but the entirety of south Florida
21 was when the eye of Hurricane Andrew made landfall in
22 1992 over the plant.

23 Compared to Homestead and other
24 surrounding areas, the site was relatively undamaged
25 and its robust design really enabled the existing

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1 nuclear units to be available early in the recovery
2 process.

3 I was working at the maintenance
4 department at Turkey Point during this time period.
5 We had a mandatory evacuation for my neighborhood,
6 however, I was to make -- I was able to make it back
7 home the day after Andrew hit.

8 My home at the time was located just a
9 little south of the maximum surge, and being within
10 one to two miles of Biscayne Bay, we had shrimp and
11 puddles outside my front door and we had lots of fish
12 swimming around in our pool.

13 After driving through the devastated area
14 on the way to the plant, I was both relieved and
15 pleased to see how little damage the plant had
16 sustained compared to the surrounding area.

17 Now, we'll jump ahead to 2007 when a
18 combined cycle natural gas unit began commercial
19 operation at the fifth power generating facility at
20 the site.

21 As a result, these AP1000 units would be
22 Units 6 and 7 at Turkey Point. Since we submitted the
23 application, the two existing nuclear units completed
24 power up rates of approximately 100 megawatts electric
25 each and are now approximately 800 megawatts net.

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1 Turkey Point's Units 1 and 2 are no longer
2 operating and have been converted to synchronous
3 condenser mode which either generates or absorbs
4 reactor power as needed to adjust the grid to voltage
5 or to improve the system power factor.

6 The smoke stack which you can see in this
7 picture had been a landmark for Boda and Biscayne Bay
8 many, many years and have now been removed.

9 Okay, slide 11, please?

10 Okay, this slide shows a rendering of the
11 proposed units. Of course, it's a little dated as it
12 includes the stacks from Units 1 and 2. But, this
13 gives us a sense of the overall project as it would be
14 built.

15 Realizing that the site has a unique
16 location and potential impact environmental resources,
17 FPL has endeavored to take this into account in the
18 planning for the new units.

19 For instance, FPL will use an existing
20 barge slip for receiving and unloading heavy
21 equipment. We relocated the reclaimed water treatment
22 facility to reduce wetland impacts and, foremost, we
23 are using land for the site which is in the already
24 impacted industrial waste water facility.

25 Slide 12, please?

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1 During our Combined License review, we
2 were able to take advantage of the design center
3 working group process and gain efficiencies from other
4 AP1000 applicants.

5 Several generic design issues were
6 identified during the application process and were
7 efficiently resolved for Turkey Point once those
8 issues were resolved for the Levy Plant.

9 In addition, FPL addressed such issues as
10 the Fukushima event, Central Eastern United States
11 seismic source characterization and the NRC electrical
12 bulletin 2012-01 related to an off site power loss of
13 phase event as part of the design center working group
14 process.

15 We have continued to interface with the
16 licensees as these same benefits of the DCWG process
17 apply after an applicant receives its license.

18 It was very helpful resolving issues one
19 time and we're able to take full advantage of the
20 process.

21 Slide 13, please?

22 Slide 13 shows a total list of exemptions
23 for our application. In fact, all of these same
24 exemptions have been approved by the NRC for other
25 AP1000 applicants.

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1 The five previous generic issues
2 exemptions were issued -- were taken by Levy and WS
3 Lee.

4 The maximum wet -- safety wet bulb non-
5 coincident air temperature exemption was necessary
6 because the Turkey Point value exceeded the DCD value
7 by 1.3 degrees Fahrenheit.

8 This is the same exemption granted to VC
9 Summer, although their value was one-tenth of a degree
10 less than the Turkey Point value.

11 A sensitivity analysis was performed and
12 there was no increase in containment peak pressure for
13 Turkey Point when using the higher Turkey Point value.

14 VC Summer was able to use our analysis for
15 their exemption since our value was bounding.

16 Next slide, please?

17 FPL has a 50-year history of
18 environmentally responsible power generation at the
19 Turkey Point site which includes part of the critical
20 habitat for our population of American crocodiles.

21 This photo on the bottom right side is our
22 crocodile nursery which had its first customer before
23 we even finished our nursery.

24 Our proposed units carry on this history
25 in environmental protection philosophy. We are proud

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1 of our use of reclaimed water to help turn a waste
2 stream into a benefit for Miami-Dade County and the
3 environment.

4 Our back up cooling water system, largely
5 unseen from land, will operate with no discernable
6 impacts to aquatic communities it shares.

7 FPL's philosophy is to avoid environmental
8 impacts first, if they can't be eliminated, we will
9 then minimize impacts and finally mitigate the
10 remaining impacts an acceptable level using approaches
11 such as wetland restoration, enhancement projects and
12 mitigation bank credits.

13 Our project location allows for the
14 avoidance of a significant wetland impact, the biggest
15 one are here is our site lies within the existing
16 industrial waste water facility.

17 Practically 80 percent of our transmission
18 lines will be in existing corridors. I should note
19 that our assessments of project impacts used bounding
20 assumptions and we fully expect that the realized
21 impacts will be much smaller than what we predicted.

22 Slide 15, please?

23 The NRC began its independent
24 environmental review of the project, including FPL's
25 environmental report in 2009. The environmental

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1 scoping was completed in 2010 and the staff issued the
2 draft environmental impact statement in 2015.

3 There is a large amount of interest in the
4 project from stakeholders at every stage of its review
5 who comment extensively on the impacts process and
6 conclusions.

7 FPL met with several stakeholders in order
8 to help them better understand the issues the NRC were
9 tasked to examine.

10 The stakeholder input was an important
11 aspect of bringing the NEPA review process to closure
12 in 2016 when the final EPIS was made available.

13 For me, personally, having never been
14 through the environmental review process before, I was
15 impressed with the breadth and depth of the
16 environmental review associated with licensing a
17 nuclear plant.

18 I was pleased to see the interest from the
19 public during the many meetings for the project.

20 During this time period as well, the NRC
21 licensing board reviewed a challenge to the
22 environmental review of certain nonradiological
23 aspects of disposing of waste water using injection
24 wells.

25 Ultimately, the board concluded that the

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1 NRC staff's EIS adequately evaluated these potential
2 impacts with no changes necessary to the staff's
3 review in the EIS.

4 Last slide, please?

5 Thank you very much for this opportunity.
6 This completes FPL's overview presentation.

7 CHAIRMAN SVINICKI: Thank you very much
8 for that overview presentation.

9 We will begin on this question and answer
10 period. I will be recognized first, so let me begin.

11 Again, that was a very informative
12 overview. Also, I appreciate that you have given some
13 context to the specific and novel issues that were
14 posed in the staff's review of this particular
15 application.

16 So, I think that will be helpful, some of
17 that we'll be exploring, I know, in more depth when we
18 get to the safety and environmental panels later this
19 morning and this afternoon.

20 I -- my questions are fairly general.
21 Again, this is an overview discussion.

22 I know that there may be some duration of
23 time between if the Commission authorizes the issuance
24 of the licenses. Between that action and a decision
25 on whether or not to construct these units, there has

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1 been mention made of your integrated resource planning
2 and the annual update that is done to that.

3 Could you discuss or describe, though, at
4 a very high level as that integrated resource plan is
5 looked at on an annual basis, how would these licenses
6 come into play in the potential construction of these
7 units?

8 What are some of the triggers or high
9 level factors, obvious need for power, but you don't
10 need to choose these units to be the new units to
11 provide that power.

12 Can you give a kind of at a strategic or
13 very high level how that will be approached in the
14 years between granting of the licenses, should the
15 Commission vote to do that, and initiation of
16 construction, what would that period look like in
17 terms of weighing strategic options for FPL?

18 MR. NAZAR: Madam Chairman, the additional
19 nuclear capacity remains an important consideration at
20 FPL resource planning.

21 With respect to obtaining the COL for
22 Turkey Point 6 and 7, we're going to pause, as you
23 know, that the first wave of construction that is
24 ongoing, there are significant opportunities for
25 learning from those constructions.

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1 So, at this point, we plan to pause and
2 continue monitoring the construction of the Vogtle
3 projects and lessons learned from that.

4 As I mentioned during my remarks, that
5 when we implemented the operate at six of our units
6 that we gained significant experience of the
7 construction. And, actually, dealt with some of the
8 construction companies that they are building actually
9 new nuclear power plants.

10 That mega project was more than \$4 billion
11 project. So, we had a great deal of learning from
12 that particular project.

13 In addition to that, as we continue
14 learning from the first wave of construction, then, at
15 that point, that we're going to decide as far as the
16 timing. It's very important for us to make sure that
17 the lessons learned are going to be incorporated into
18 our decision making.

19 And, that would serve not only our company
20 but our customers a great deal to make sure that we --
21 once we decide to start with the pre-construction,
22 that we are going to be very efficient, cost-effective
23 and providing the benefit that our customers expect
24 from us.

25 CHAIRMAN SVINICKI: Thank you.

1 From that, is it accurate to characterize
2 that FPL will have an active knowledge management
3 program over this, again, option of building these
4 units at some point in the future?

5 You indicated that you would be monitoring
6 ongoing activities with AP1000. Will you have kind of
7 a center of expertise within FPL that will be the
8 institutional knowledge in case there is, again, this
9 duration of time between the hearing and the
10 Commission subsequent authorization of issuance of the
11 license, should we authorize that and the decision
12 that you would have to construct?

13 MR. NAZAR: Madam Chairman, at this point,
14 that we plan to maintain the COL. And, in order to
15 maintain that, we're going to continue keeping up with
16 the lessons learned from the first wave of
17 construction.

18 We plan to keep some Duke Power employees
19 that they've involved with the application for the COL
20 -- on Turkey Point 6 and 7, that they're going to
21 continue those learning opportunities and then we're
22 going to incorporate in real time as we're learning
23 those opportunities.

24 CHAIRMAN SVINICKI: Thank you.

25 My second question is a little more narrow

1 in scope. There was a description of the departures
2 and exemptions that were taken in the application.
3 And, I would characterize those as being a very
4 judicious pursuit of exemptions and departures.

5 Because I think, essentially, there was
6 only one Turkey Point specific exemption and it's only
7 the value for wet bulb that varied with another
8 applicant. So, that wasn't truly unique in the sense
9 that only Turkey Point pursued that exemption.

10 What was the overall strategic approach to
11 deciding to limit yourselves in that way? Obviously,
12 there could have been other matters that you might
13 have taken some site specific approach to.

14 So, was it to have strong coherence with
15 the referenced COLA? Could you just describe again
16 how you approached taking such a, again, such a narrow
17 pursuit of exemptions and departures?

18 MR. MAHER: Yes, Madam Chairman.

19 The reason for the narrow pursuit, if you
20 will, is really to benefit from the design center
21 working group and be able to coordinate with the other
22 AP1000 applicants in a combine way to be able to share
23 costs associated with those and share the lessons
24 learned and calculations associated being able to
25 apply those.

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1 So, like Mr. Franzone had told you with
2 respect to the non-coincident air temperature, Summer
3 units had the exact same issue and we were able to
4 coordinate with Westinghouse and the associated
5 calculations and requests to the Nuclear Regulatory
6 Commission to be able to provide that appropriate
7 level of calculations and exemptions.

8 CHAIRMAN SVINICKI: Okay, thank you for
9 that.

10 Next, I will recognize Commissioner Baran
11 for any questions he may have.

12 COMMISSIONER BARAN: Thanks.

13 Well, welcome, thank you for your
14 presentations.

15 Mr. Franzone mentioned Hurricane Andrew.
16 Given the location of Turkey Point, hurricanes are
17 obviously a natural hazard that the proposed units
18 would need to be able to handle.

19 Hurricane Irma made landfall in Florida a
20 couple months ago well to the southwest of this site.
21 At its peak, Irma had sustained winds of 185 miles per
22 hour and estimated gust wind speed of 225 miles per
23 hour.

24 Would the proposed units be able to safely
25 handle a direct hit from a hurricane like Irma?

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1 MR. FRANZONE: Well, the short answer is
2 yes. Right? Because we -- and, you'll see in the
3 safety panel, we discuss some wind events.

4 But the -- for the AP1000, the controlling
5 event was the tornado missiles. And, we actually went
6 a step further and looked at hurricane generated
7 missiles because the straight line winds of the
8 hurricane.

9 And, when we evaluated that, Westinghouse
10 evaluated for that, there was no issues.

11 So, even a hurricane like Irma was easily
12 -- could have been handled by the -- because the
13 actual wind that we used was 260 miles per hour, we
14 got that from the Reg Guide 1.221. So --

15 COMMISSIONER BARAN: You have substantial
16 margin over a hurricane like Irma?

17 MR. FRANZONE: Correct.

18 COMMISSIONER BARAN: Okay, thank you.

19 That's all I have for this panel.

20 CHAIRMAN SVINICKI: Thank you.

21 Commissioner Burns?

22 COMMISSIONER BURNS: Yes, thank you.

23 And, I appreciate the presentations and
24 the testimony of the -- on this opening panel on
25 behalf of the Applicant.

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1 Mr. Maher, you made a reference to unique
2 experiences. I think I've got the sentence right. In
3 terms of Part 52 and the implementation of the Part 52
4 process, and, if you don't mind, I'd appreciate if you
5 would elaborate what your experiences were with Part
6 52.

7 If you want to put it in the context, what
8 may have surprised you or what were bigger hurdles?
9 Because, I think, and part of it is, you know, from my
10 own interest in terms of having been involved with
11 this process almost since the beginning, well, yes,
12 since the beginning.

13 And, knowing that, in some respects, it's
14 only, even though this is a rule that dates back to
15 1989, this is really a rule that has only been
16 exercised since the turn of the century.

17 So, I'd appreciate the insights you were
18 alluding to from your experience with it.

19 MR. MAHER: Yes, sir.

20 Part of my unique experiences with Part 52
21 is being able to utilize the design certification
22 process as part of the application.

23 I think that it was a very unique feature
24 associated with the licensing process. And,
25 understanding the previous licensing process was a

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1 very big benefit associated with applicants and I
2 believe with NRC staff and being able to go through
3 and approve those licenses.

4 With respect to the unique features of it,
5 I would say having a standardized design and being
6 able to coordinate with other applicants, both on the
7 -- on engineering features and engineering issues that
8 came up as a result of that particular standardized
9 design in a coordinated fashion was very beneficial to
10 both us as an applicant and, hopefully, to NRC and the
11 other utilities.

12 COMMISSIONER BURNS: Okay.

13 And, some of -- what would you say were
14 some of the challenges with it? Because, as you say,
15 one of the -- and you've actually spoken to what I
16 would call some of the intention behind Part 52, which
17 is to enhance standardization of units.

18 And, thus, and also in terms of making the
19 licensing process more effective as a result of that
20 standardization.

21 But, I think there have been some
22 unintended consequences, too. So, what I'd
23 appreciate, you know, sort of your perspective on
24 that.

25 MR. MAHER: Thank you.

1 And, there were some challenges associated
2 with that. And, Steve alluded to that as part of his
3 overview presentation dealing with the design issues,
4 if you were, that came about as a result of the
5 ongoing construction aspects and design finalization
6 on the Summer and Vogtle units.

7 Those particular design issues came up as
8 a -- at a time when they were constructing their
9 units. But, when there were three other applicants
10 that needed to go through and complete their COL
11 process.

12 And, as a result of that process, that
13 challenged both us and Duke in being able to finalize
14 those particular issues as COL applicants to the NRC
15 staff's satisfaction even though they were actually
16 identified as part of the design finalization efforts
17 at Vogtle and Summer.

18 COMMISSIONER BURNS: Okay, thank you.

19 Just out of curiosity, I saw some of the
20 maps, although a little strained to be able to see
21 them on those screens.

22 Have you undertaken any what we'll call
23 pre-construction activities or site preparation
24 activities for the area that would be used for 6 and
25 7?

1 MR. MAHER: No, sir, we have not taken any
2 pre-construction activities associated with the site.
3 Under Florida law, we are precluded from actually
4 doing --

5 COMMISSIONER BURNS: Okay.

6 MR. MAHER: -- those activities until we
7 get public service commission approval.

8 COMMISSIONER BURNS: Okay, all right,
9 thank you.

10 And, my final question for this panel, you
11 spoke about sort of cooperation among other applicants
12 and following the activities, for example, the
13 construction activities that have been undertaken at
14 both Vogtle and Summer.

15 Mr. Nazar may have mentioned this, but,
16 are you also trying to get any insights from the
17 experience with the construction in China?

18 MR. NAZAR: Yes, Commissioner.

19 Actually, we have visited both of the
20 sites, AP1000 sites in China. And, during the
21 construction. And, there we keep all the exactly as
22 you mentioned, they have been learning opportunities
23 from China also.

24 Myself in addition to some of the staff,
25 we visited both sites when they were at 60 percent

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1 completion and at 80 percent completion. And, we had
2 significant learning opportunities, especially some of
3 the design changes that Mr. Maher referred to and also
4 making sure that our COL was going to take those into
5 consideration for our applications.

6 COMMISSIONER BURNS: Okay, thank you.

7 Thank you, thank you, Chairman.

8 CHAIRMAN SVINICKI: Again, I thank the
9 panel.

10 I will now ask the NRC staff overview
11 witness panel to please take the seats at the table.

12 In this panel, the staff will provide an
13 overview of its review of the application and a
14 summary of their regulatory findings.

15 As the panelists are preparing to take
16 their seats here, before they begin presenting, I
17 would ask that they introduce themselves.

18 And, I believe that we will begin with the
19 Deputy Director of the Office of New Reactors, Vonna
20 Ordaz. Vonna, when you are ready, please proceed.

21 MS. ORDAZ: Good morning.

22 CHAIRMAN SVINICKI: Good morning.

23 MS. ORDAZ: I'm Vonna Ordaz. I'm the
24 Deputy Director for the Office of New Reactors.

25 MR. AKSTULEWICZ: Good morning,

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1 Commissioners. I'm Frank Akstulewicz, I'm the
2 Division Director in the Division of New Reactor
3 Licensing.

4 MS. DIXON-HERRITY: And, I'm Jennifer
5 Dixon-Herrity, I'm Chief of Licensing Branch IV, the
6 branch that manages the AP1000 design center reviews.

7 CHAIRMAN SVINICKI: Great, Vonna, please
8 lead off.

9 MS. ORDAZ: Thank you, Chairman, good
10 morning.

11 On behalf of the NRC staff, that reviewed
12 the Turkey Point Units 6 and 7 Combined License
13 Application, or COLA, we are pleased to address the
14 Commission at this mandatory hearing.

15 The team here today will present the
16 results of the staff's review of the Turkey Point
17 Units 6 and 7 COLA.

18 The Applicant, Florida Power and Light, or
19 FP&L, proposed to locate the new units in Miami-Dade
20 County, Florida at the Turkey Point site where it has
21 five existing power generating units.

22 Unit 1 and 2 operate as synchronized
23 condensers to stabilize the grid but do not generate
24 power. Units 3 and 4 are two pressurized water
25 reactor nuclear units. And Unit 5 is a natural gas

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1 combined cycle steam electric generating unit.

2 The staff's final safety evaluation
3 report, or FSER, was made publically available on
4 November 14, 2016. And, the staff's final
5 environmental impact statement, or FEIS, was published
6 on October 28, 2016.

7 These documents are a combination of a
8 seven year review by the staff and represent the
9 results of the coordinated effort of scientists,
10 engineers, attorneys and administrative professionals
11 from multiple offices within the Agency as well as
12 other agencies and our consultants.

13 Slide 2, please?

14 With me on this panel, Mr. Frank
15 Akstulewicz, the Director of the Division of New
16 Reactor Licensing and Ms. Jennifer Dixon-Herrity, as
17 she mentioned, Chief of the Licensing Branch IV who
18 has responsibility for all of the AP1000 reviews.

19 Jennifer kindly is replacing Anna Bradford
20 today at this hearing. Anna had an unexpected
21 emergency.

22 Slide three, please?

23 Today, I will give you an overview of the
24 COLA and the staff's review.

25 Mr. Akstulewicz will summarize the staff's

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1 findings in the safety review.

2 And, Ms. Dixon-Herrity will give an
3 overview of the environmental review and findings.

4 The staff docketed the initial version of
5 the COLA in September 2009 and completed its review in
6 December 2016.

7 During that period of time, the staff
8 expended approximately 89,000 hours on the safety and
9 environmental reviews.

10 This effort involved well over 100
11 engineers, scientists and technical specialists.

12 During this time, the staff conducted
13 approximately 80 public meetings and conference calls
14 in support of the Turkey Point COLA review.

15 The Applicant responded to approximately
16 516 staff questions, of which 340 were associated with
17 the safety review and 176 with the environmental
18 review.

19 In addition, the staff considered over
20 11,000 public comments on the draft environmental
21 impact statement.

22 Contractors working in collaboration with
23 the staff devoted over 16,000 hours to support the
24 environmental and safety reviews.

25 The review of this application was a very

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1 thorough effort and focused on safety and protecting
2 the environment.

3 Within the NRC, the offices that
4 contributed to the review include the Office of
5 Nuclear Security and Incident Response which reviewed
6 the emergency preparedness and security areas, the
7 Office of Nuclear Reactor Regulation which evaluated
8 financial qualification aspects of the application and
9 the Office of the Nuclear Material Safety and
10 Safeguards which support the reviews for the licenses
11 under Part 30 for byproduct material, Part 40 for
12 source material and Part 70 for special nuclear
13 material.

14 The Office of the General Counsel reviewed
15 the FSER and the FEIS.

16 And, finally, the Advisory Committee on
17 Reactor Safeguards, or ACRS, reviewed and reported on
18 the safety aspects of the Turkey Point application in
19 accordance with the requirements of 10 CFR 52.87.

20 In addition, NRC Region II supported
21 environmental meetings in the community near the
22 Turkey Point site.

23 The U.S. Army Corps of Engineers, National
24 Park Service and the Department of Homeland Security
25 also contributed to the NRC review.

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1 Specifically, the U.S. Army Corps of
2 Engineers provided input on the various sections of
3 the FEIS including, but not limited to, wetlands,
4 ecology and cultural and historic resources.

5 I would like to note that Ms. Meghan
6 Clauser from the Corps, the Corps is Jacksonville
7 District is with us today, welcome Meghan. And, we
8 thank her for assistance throughout this process.

9 The National Park Services provided
10 special expertise for the areas in and around the
11 adjacent Biscayne and Everglades National Parks.

12 And, the Department of Homeland Security
13 reviewed the offsite emergency plans.

14 Slide four, please?

15 On June 30, 2009, FP&L submitted the COLA
16 to construct and operate two AP1000 units in Miami-
17 Dade County, Florida.

18 The Turkey Point Units 6 and 7 COLA
19 incorporates by reference the AP1000 design
20 certification document revision 19 and Appendix D to
21 10 CFR Part 52, the AP1000 design certification rule.

22 The AP1000 design was certified by rule in
23 2011 and documented in NUREG-1793 and its supplements.

24 Based on the finality that NRC regulations
25 afford to a certified design, the scope of the staff's

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1 COL technical review did not include items that were
2 resolved within the scope of this certified design.

3 Additionally, the staff's review applied
4 the design center review approach, the Commission's
5 policy intended to promote standardization of COLAs.

6 This policy directs the staff to perform
7 one technical review for information, comments and
8 multiple applications that is outside the scope of the
9 design certification and used the decision resulting
10 from the single review to support decisions on
11 multiple COLAs or subsequent COLAs.

12 The review for the Turkey Point Units 6
13 and 7 primarily focused on plant specific aspects of
14 the application that are the responsibility of the
15 Applicant such as operational programs, site specific
16 design, COL information items and departures from the
17 certified design.

18 The Turkey Point COLA is the only
19 remaining application referencing the AP1000 design
20 currently before the Commission.

21 The Commission has previously issued eight
22 Combined Licenses for units referencing the AP1000
23 design.

24 Slide five, please?

25 In accordance with 10 CFR 52.87, the ACRS

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1 examined the staff's safety review of the Turkey Point
2 Units 6 and 7 COLA.

3 The Applicant and staff support one AP1000
4 ACRS Subcommittee meeting, specifically related to
5 Turkey Point COLA and safety evaluation.

6 The staff presented the results of its
7 review of the Turkey Point COLA to the full ACRS in
8 September 2016.

9 Following the 2016 September full
10 Committee meeting, the ACRS issued a report on
11 September 16, 2016 concluding that there is reasonable
12 assurance that Turkey Point Units 6 and 7 can be built
13 and operated without undue risk to public health and
14 safety.

15 This ACRS report recommended approval of
16 the Turkey Point COLA.

17 The staff issued the Turkey Point Units 6
18 and 7 FSER on November 14, 2016. This FSER and FEIS
19 and our statement in support of the hearing provide
20 what the staff considers an adequate basis for the
21 Commission to make the necessary regulatory findings
22 under 10 CFR Part 52.97.

23 We look forward to responding to your
24 questions at this hearing. I will now turn the
25 presentation over to Mr. Frank Akstulewicz.

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1 MR. AKSTULEWICZ: Thank you, Vonna.

2 Good morning. I'm Frank Akstulewicz, the
3 Director in the Division of New Reactor Licensing in
4 the Office of New Reactors.

5 Slide six, please?

6 The staff prepared SECY-16-0136 dated
7 December 2, 2016 to support this mandatory hearing.
8 In that paper, the staff summarized the bases that
9 would support the Commission's determination that the
10 staff's review is adequate to support the findings set
11 forth in both 10 CFR 52.97 and 10 CFR 51.107.

12 The SECY paper provided an overview of the
13 findings that support the issuance of COLs for Turkey
14 Point Units 6 and 7.

15 The Commission must make each of the
16 following findings in 10 CFR 52.97 in order to issue
17 a COL. I will summarize the staff's bases supporting
18 each finding.

19 First, the applicable standards and
20 requirements of the Atomic Energy Act and the
21 Commission's regulations have been met.

22 The staff reviewed and evaluated the
23 application against the applicable criteria in the
24 Commission's regulations. Based on the staff's review
25 as documented in its final safety evaluation report

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1 and then the final environmental impact statement, the
2 staff concludes that the applicable standards and
3 requirements of the Atomic Energy Act of 1954 as
4 amended and the Commission's regulations have been
5 met.

6 Second, any required notifications to
7 other agencies or bodies have been duly made.

8 As documented in SECY-16-0136, all
9 required notifications such as to the Public Service
10 Commission of Florida as well as the required Federal
11 Register Notifications have been made.

12 Slide seven, please?

13 Third, there is reasonable assurance that
14 the facility will be constructed and will operate in
15 conformity with the license, the provisions of the
16 Atomic Energy Act and the Commission's regulations.

17 As the SECY paper states, the staff
18 believes that its review as documented in the safety
19 evaluation and impact statement, the inspections,
20 tests, analyses and acceptance criteria, or ITAAC, and
21 the license conditions provide the necessary assurance
22 that the units will be constructed and operated as
23 required.

24 Fourth, the Applicant is technically and
25 financially qualified to engage in the activities

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1 authorized.

2 The technical and financial qualifications
3 of the Applicant are summarized in the SECY paper and
4 documented in more detail in Chapters 1, 13 and 17 of
5 the final safety evaluation report.

6 Slide eight, please?

7 Fifth, the issuance of the COLs will not
8 be inimical to the common defense and security or
9 public health and safety.

10 The specific bases for inimicality finding
11 have been provided in the staff's SECY paper.

12 And, sixth, the findings required by
13 Subpart A of 10 CFR Part 51 have been duly made.

14 The staff's conclusion supporting the
15 environmental findings required by Subpart A will be
16 presented by Jennifer Dixon-Herrity who will now
17 provide an overview of the staff's environmental
18 review.

19 MR. DIXON-HERRITY: Thank you, Frank.

20 Good morning, I'm Jennifer Dixon-Herrity.
21 As we said before, I'm Chief of Licensing Branch IV in
22 the Office of New Reactors.

23 I'll be discussing the environmental
24 review and will provide an overview of the process we
25 used in conducting the review, the draft summary of

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1 record of decision and the staff's recommendation as
2 a result of that review.

3 I will also discuss the regulatory
4 findings that need to be made under 10 CFR 51.107
5 before the licenses can be granted.

6 Slide nine, please?

7 The staff prepared the EIS for the Turkey
8 Point Units 6 and 7 COLA in accordance with the
9 National Environmental Policy Act of 1969 and the
10 requirements of 10 CFR Part 51.

11 The staff prepared the EIS based on
12 independent assessment of the information provided by
13 the Applicant and information developed independently
14 by the staff including information gathered through
15 consultations with other agencies.

16 The U.S. Army Corps of Engineers, or
17 Corps, fully participated with the staff as a
18 cooperating Agency in preparing the Turkey Point EIS
19 under the terms of an existing Memorandum of
20 Understanding between the NRC and the Corps.

21 The specific roles of the NRC and Corps
22 for preparation of the EIS on the Turkey Point
23 application are set forth in a Memorandum of Agreement
24 between the NRC, the Corps and the National Park
25 Service.

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1 As a member of the Environmental Review
2 team, the Corps staff participated in site visits,
3 consultations with other agencies and development of
4 the draft and final EIS.

5 In addition, the National Park Service
6 participated in the environmental review as a
7 cooperating Agency under the Memorandum of Agreement
8 previously noted.

9 The National Park Service provided special
10 expertise for the areas in and around the adjacent
11 Biscayne and Everglades National Parks.

12 However, only the NRC and the Corps have
13 specific regulatory actions related to the proposed
14 Combined Licenses as explained in the Memorandum of
15 Agreement, therefore, NRC and the Corps also referred
16 to as the Review Team made the impact determination in
17 the EIS and these impact determinations should not be
18 attributed to the National Park Service.

19 Slide ten, please?

20 The NRC began the environmental process
21 for the Turkey Point COLA by publishing a Notice of
22 Intent to Prepare an EIS and conduct scoping in the
23 Federal Register on June 15, 2010.

24 Two scoping meetings were held to obtain
25 public input on the scope of the environmental review

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1 in Homestead, Florida on July 15, 2010.

2 Furthermore, staff contacted federal,
3 state, regional and local agencies and federally
4 recognized Indian Tribes to solicit comments.

5 Staff considered all the comments received
6 during the scoping process and developed responses for
7 each comment. The responses are documented in the
8 scoping summary report and also in Appendix D of the
9 EIS.

10 To prepare the draft EIS, the staff
11 carried out independent analyses and evaluations based
12 on information provided by the Applicant which
13 included supplement or clarifying information in the
14 form of responses to Requests for Additional
15 Information.

16 The staff considered information from
17 federal, state, Tribal, regional and local agencies
18 and independent information sources that we developed.

19 Slide 11, please?

20 All the information gathered during the
21 scoping phase was analyzed and used to prepare the
22 draft EIS which we published in February of 2015.

23 The public comment period ended on May 22,
24 2015. The public -- on May 28, 2015, the NRC
25 published a Notice reopening and extending the comment

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1 period from May 22, 2015 to July 17, 2015 to allow
2 more time for members of the public to develop and
3 submit comments.

4 The staff held three public meetings to
5 describe the results of the environmental report to
6 provide members of the public with information to
7 assist them in formulating comments on the draft EIS
8 and to respond to questions and accept comments.

9 The first meeting took place on April 22,
10 2015 in Miami, Florida. The second and third meetings
11 took place on April 23, 2015 in Homestead, Florida.

12 All comments received on the draft were
13 considered in preparing the FEIS and are documented in
14 Appendix E of the EIS.

15 Slide 12, please?

16 On October 28, 2016, the staff published
17 the FEIS as NUREG-2176. However, shortly after
18 publishing NUREG-2176, the staff identified 59 comment
19 letters received during the comment period that were
20 inadvertently not addressed in the FEIS.

21 None of these comments changed the Review
22 Team's analyses or conclusions in the FIES. To
23 address these comments and to further the purposes of
24 the National Environmental Policy Act, the staff
25 issued a supplement to NUREG-2176 on December 2, 2016

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1 in accordance with 10 CFR 51.92.

2 The staff did not request comments on this
3 supplement because the inadvertently omitted comments
4 did not provide new and significant information
5 bearing on the proposed action.

6 As stated in the FEIS, the staff's
7 recommendation related to the environmental aspects of
8 the proposed action is that the COL should be issued.

9 The staff based its recommendation on the
10 Turkey Point COLA environmental report, consultation
11 with federal, state, Tribal and local agencies, the
12 team's independent review, the consideration of public
13 comments received on the environmental review and the
14 assessments summarized in the EIS, including the
15 potential mitigation measures identified in the
16 environmental report and the EIS.

17 This recommendation also rests on the
18 staff determination that none of the alternative sites
19 assessed is obviously superior to the Turkey Point
20 site.

21 Slide 13, please?

22 The staff included a draft summary record
23 of decision as a reference in the SECY. This document
24 states the decision being made and identifies all
25 alternatives considered in reaching the decision.

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1 The draft summary record of decision also
2 discusses preferences among the alternatives and
3 states whether the Commission has taken all
4 practicable measures within its jurisdiction to avoid
5 or minimize environmental harm from the site selected.

6 Slide 14, please?

7 The next few slides list environmental
8 findings pursuant to 10 CFR 51.107(a) that the
9 Commission must make to support the issuance of the
10 Turkey Point Units 6 and 7 COLs.

11 The staff believes that the scope of the
12 environmental review, the methods used to conduct the
13 review and the conclusion reached in the EIS are
14 sufficient to support a positive Commission
15 determination regarding these findings.

16 To satisfy the first finding as detailed
17 on this slide, the staff's environmental review used
18 a systematic interdisciplinary approach to integrate
19 information from many fields, including national,
20 natural and social sciences as well as environmental
21 sciences in accordance with NEPA Section 202(2)(a).

22 The staff's review also comports with
23 NRC's requirements in Subpart A of 10 CFR Part 51.

24 Staff concludes that the environmental
25 findings in the EIS constitute the hard look required

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1 by NEPA and have reasonable support and logic and
2 fact.

3 In accordance with NEPA Section 102(2)©,
4 the EIS for Turkey Point COLs addresses the
5 environmental impact of the proposed action, any
6 avoidable adverse environmental effect, alternatives
7 to the proposed action, the relationship between local
8 short-term uses of the environment and the maintenance
9 and enhancement of long-term productivity and any
10 irreversible and irretrievable commitments of
11 resources that would be involved in the proposed
12 action, should it be implemented.

13 As support by correspondence presented in
14 Appendices C and F of the EIS, the staff concludes
15 that the requirement of NEPA Section 102(2)© was
16 fulfilled in part by consulting with and obtaining
17 comments from other federal agencies with jurisdiction
18 by law or special expertise.

19 As noted earlier, the Corps fully
20 participated with the NRC as a cooperating Agency in
21 preparing the EIS and the National Park Service also
22 participated as a cooperating Agency by providing
23 special expertise with the areas in and around the
24 nearby national parks.

25 In accordance with NEPA Section 102(2)(e),

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1 the staff concludes that the EIS Chapter 9
2 demonstrates that the staff adequately considered
3 alternatives to the proposed action.

4 The alternatives considered in the EIS
5 include the no action alternative, site alternatives,
6 energy alternatives, system design alternatives and
7 mitigation alternatives for severe accidents.

8 To satisfy the second and third findings
9 which appear on this slide and the next, Chapter 10 of
10 the EIS provides the staff's cost-benefit assessment
11 which considered conflicting factors such as the need
12 for power as well as reasonable alternatives to the
13 proposed action.

14 Slide 15, please?

15 Based on that analysis, the staff
16 concluded that the construction and operation of the
17 proposed Turkey Point Units 6 and 7 would have accrued
18 benefits that would be expected to outweigh the
19 economic, environmental and social costs.

20 As a result, the staff recommends that the
21 COLs be issued.

22 For the fourth finding, the staff believes
23 that the Commission will be able to find after this
24 hearing that the NEPA review performed by the staff
25 has been adequate.

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1 The staff performed a thorough and
2 complete environmental review sufficient to meet the
3 requirements of NEPA and adequate to inform the
4 Commission's action on the requested COLs.

5 I'll now turn this presentation back over
6 to Vonna.

7 MS. ORDAZ: Thank you, Jennifer.

8 That completes the staff's overview.

9 Thank you, Chairman

10 CHAIRMAN SVINICKI: Well, thank you very
11 much to the witnesses for the staff's overview
12 presentation.

13 And, Jennifer, I want I want to thank you
14 for stepping in on short notice for you colleague. I
15 appreciate your willingness to do that here today.

16 We begin the questioning of this panel
17 with Commissioner Baran. Please proceed.

18 COMMISSIONER BARAN: Well, thank you for
19 your presentations. I actually don't have any
20 questions for this panel, so I'll reserve my time.

21 Thanks.

22 CHAIRMAN SVINICKI: All right, thank you.

23 Commissioner Burns?

24 COMMISSIONER BURNS: Oh, thank you,
25 Chairman.

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1 Thank you to the staff witnesses for their
2 presentations here this morning and as the Chairman
3 said, for Jennifer for stepping up to the plate here.

4 Just a couple things in the nature of the
5 overview since that's where we are at is the overview
6 panel.

7 I think as Frank or Vonna may have said,
8 we have issued eight AP1000 COLs to other applicants
9 that have preceded FP&L here today.

10 And, again, as the answer to -- and
11 elicited out of the -- from the first panel in terms
12 of my question with respect to Part 52 process, part
13 of this is in the design and intention of Part 52 is
14 to enhance standardization across the fleet to improve
15 the efficiency of licensing reviews and to reach -- in
16 order to reach the necessary conclusions under the
17 various statutes of the Atomic Energy Act as well as
18 NEPA and others in making licensing decisions.

19 So, sort of at a high level, if you'd say,
20 again, looking at going through the process where an
21 applicant invokes the standardized design, what were
22 the areas where the deviations from it or either
23 deviations or a unique challenges that you think you
24 faced with respect to this application, recognizing it
25 starts out with a reference to a standardized design?

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1 MR. AKSTULEWICZ: So, it's a great
2 question, Commissioner.

3 I think you have to step back and look at
4 the context in which this application arrived to kind
5 of answer the lesson learned.

6 We were in the midst of a design
7 certification review in parallel with the COL review.
8 And, I think one of the key lessons learned is that
9 particular combination of activities is very
10 challenging for the COL applicant, not only the staff,
11 to try to maintain its application contemporary with
12 whatever the design changes are that are happening
13 with the certification as it's under review.

14 Once you set that aside, I think we have
15 seen, aside from the issues that Mr. Maher raised
16 which was how to deal with issues that are identified
17 during the construction of units while other units are
18 under review, I think that's still an issue that we're
19 -- we have a handle on, but we're still trying to
20 figure out what's the most efficient and effective way
21 to deal with those matters.

22 And we have meetings with the industry
23 that were set up to discuss how to deal with those in
24 the near future as a matter of fact.

25 And then, the third part is, I think I can

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1 speak very candidly to how the nature of the review
2 has evolved.

3 And, we have -- the purpose of a Part 52
4 was to focus on truly those site specific and unique
5 matters.

6 And, I think as we've progressed along
7 through the AP1000s, we've seen how those issues have
8 narrowed to really just the site specific matters.

9 And, I think that has been a benefit, not
10 a problem. But, clearly, the intent of the rule as it
11 was structured, and we've seen that play out in the
12 review process late in this particular application.

13 COMMISSIONER BURNS: So, to paraphrase
14 what I think I heard you say is that we're -- as our
15 experience has grown it really -- the model of
16 focusing on site specific matters, we really have
17 achieved that or are doing a better job at that, I
18 think. I don't mean to put words in your mouth, but
19 I think that's what hearing you say.

20 MR. AKSTULEWICZ: Yes, Commissioner,
21 that's actually correct.

22 And, we've seen it to a lesser degree in
23 the ESPWR design center because there's only two
24 plants --

25 COMMISSIONER BURNS: Right.

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1 MR. AKSTULEWICZ: -- in that center. But,
2 here, where there has been a progression of activity
3 over time we have seen the benefits play out.

4 COMMISSIONER BURNS: Yes, and just to
5 reflect on one of your comments, again, if we go back
6 in time and the vision of how Part 52 would work, I
7 think it was -- because you alluded to in your
8 testimony just now, you alluded to the fact that one
9 of the difficulties for the staff as well as
10 applicants is an ongoing design certification review
11 at the same time you're trying to engage an applicant
12 in the COL.

13 So, in this particular circumstance, as I
14 recall, we had the amendment or significant amendment
15 to the AP1000 pending before the Agency while -- and
16 then it achieved or basically approved, as I recall,
17 December 30 it was published in the Federal Register,
18 December 31, 2001 for the AP1000 amendment.

19 But, at that time, it's that parallel
20 activity which has some -- poses some challenges to
21 the staff as well as the applicant, correct?

22 MR. AKSTULEWICZ: Yes, sir.

23 COMMISSIONER BURNS: Yes. Again, my --
24 the -- I think the expectation, we go back to the
25 mothers and fathers of Part 52 was this more

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1 methodical we would have a design certification and
2 then people would go into the shop and pick things off
3 -- pick it off the shelf, right?

4 MR. AKSTULEWICZ: That's correct.

5 COMMISSIONER BURNS: Okay, thank you.

6 One last question I have, in prehearing
7 question two, the Commission asked the staff about the
8 construction cost estimates in the application.

9 And, a response the staff stated,
10 estimates produced by applicants are, quote, order of
11 magnitude costs estimations for high level planning
12 purposes only.

13 And, that order magnitude estimates,
14 quote, typically provide a point estimate cost within
15 a plus or minus 50 percent range, unquote.

16 Is this a practice the staff has typically
17 accepted in the past for cost estimates for similar
18 projects?

19 MR. AKSTULEWICZ: So, I know what I don't
20 know and I don't know that. So, I'm going to ask Dan
21 Mussatti to come up and answer your question.

22 COMMISSIONER BURNS: That's fine, that's
23 fine.

24 CHAIRMAN SVINICKI: And, again, as you
25 approach the podium, please identify yourself, your

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1 organization and indicate if you've been sworn as a
2 witness. Thank you.

3 MR. MUSSATTI: My name is Daniel Mussatti
4 and I have been sworn in. And, I'm with the DSEA
5 Environmental Group.

6 CHAIRMAN SVINICKI: Thank you.

7 MR. MUSSATTI: The question, again, is?

8 COMMISSIONER BURNS: Well, has this order
9 of magnitude cost estimates, is this typical of what
10 we have used in the past in our assessments on the
11 financial qualifications?

12 MR. MUSSATTI: Yes, it is. This is a
13 standard use throughout the cost estimating industry.

14 COMMISSIONER BURNS: Okay.

15 Can you describe, just at a high level,
16 how we use those types of estimates in our review?
17 How do they inform our decisions on the financial
18 qualifications?

19 MR. MUSSATTI: Well, the NRC doesn't use
20 the financial information that we gather for the cost
21 estimation for any sort of commerce purpose. The only
22 thing we're interested in is in resolving the
23 questions that are safety related for nuclear
24 materials.

25 And, in particular, question number four

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1 from Chairman Svinicki's list of five safety questions
2 that she brought up at the beginning of the meeting
3 today, consequently, the numbers that we use here are
4 very, very high level number that are just to give us
5 a general range as to where those costs are.

6 They're typically produced by engineers
7 very, very early in the planning stage. They don't
8 have a great deal of idea as far as what the
9 blueprints are going to look like, where the plant is
10 exactly going to be sited.

11 The estimation is made based on similar
12 projects elsewhere that have been boiled down to a
13 dollars per megawatt level and then extrapolated back
14 on to the project. So, it's a very rough estimate.

15 It's also considered an overnight cost
16 estimate in that we don't take into consideration any
17 sort of financial costs for the longevity of the
18 project. We don't anticipate any sort of costs
19 involved in materials escalating in price over time or
20 anything like that.

21 It's a very -- it's a very antiseptic cost
22 but this is the one that the industry uses.

23 COMMISSIONER BURNS: Okay, thank you.

24 Thank you, Chairman.

25 CHAIRMAN SVINICKI: Okay, I just have a

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1 couple of questions for this panel.

2 I'll begin by kind of building off the
3 foundation of what Commissioner Burns was talking
4 about on the -- he has a little bit more history with
5 Part 52 than I do.

6 But, my understanding of the purposes of
7 the benefits of one-step licensing are the same as
8 what he's articulated.

9 And, he talked about having a certified
10 design and marrying that even perhaps with an early
11 site permit and those efficiencies in the process that
12 would yield a COL review that would be expected to
13 take a shorter period of time.

14 Another efficiency I believe
15 institutionalized in Part 52 is the notion of the
16 design centered working group so you have a reference
17 COL review that goes through and then a subsequent --
18 we've mentioned that for AP1000s, that's probably the
19 richest body of experience that we have as a regulator
20 in reviewing those.

21 But, if we look at the numbers provided by
22 staff in the mandatory hearings for the AP1000, the
23 COLs that reference the AP1000, we see that there's
24 just a strong variability, if my numbers are accurate,
25 I think my staff described the transcripts from the

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1 mandatory hearings.

2 For instance, Vogtle which would be your
3 reference case, well, after it hopscotched around some
4 other applicants, it ended up being the Vogtle
5 application.

6 But, as approximately 31,000 hours, Summer
7 at 17,000 hours. So, there, you say to yourself, oh,
8 okay, well, that makes sense then, they were very
9 close together in time, a lot of similarities. So,
10 I'm sure we were harvesting various staff efficiencies
11 of having people working on both.

12 But, then, you get to some of the ones
13 that were a little bit further out. You've got 83,000
14 hours, 67,000 hours.

15 So, and I say this not in any way to find
16 fault with the review. Obviously, the Commission has
17 determined the staff's review of all those previous
18 matters to be adequate and thorough.

19 And so, what would the staff characterize,
20 though, as kind of the scatter plot of the data there?
21 Is it the uniqueness that you still -- the novel
22 issues you find with each COL even if they are an S-
23 COLA application?

24 And, Frank, I know you've got a lot of run
25 time on all these matters. Is there any working

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1 hypothesis you have about why you don't see a strict
2 linear gain in efficiency on the S-COLA reviews?

3 MR. AKSTULEWICZ: Sure, thank you,
4 Chairman.

5 I think the way I would characterize it
6 is, each of the applications had some unique issue
7 that was unanticipated. And, I think you can look at
8 Lee Station which is an example of a high seismic
9 response area following the earthquakes. Right?

10 And so, the whole reconstruction of the
11 Central and Eastern U.S. seismic capability factored
12 into a reanalysis of that particular application that
13 was unanticipated.

14 With the present application, it had its
15 own unique characteristics whether it be water
16 resource issues, with the Park Service issues, with
17 seismic or foundational issues, I'll say.

18 So, it's hard to predict whether or not
19 those issues are going to be easily resolvable and
20 whether it's going to show that there will be some
21 direct linear relationship or some centralization of
22 a scatter plot on resources from application to
23 application.

24 CHAIRMAN SVINICKI: In your direct
25 experience with these AP1000 COL applications, do you

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1 think that if it were possible to extract out those
2 unique issues, do you conclude that there is an
3 efficiency in being a subsequent COLA, might not be
4 reflected given the few data points we have, but say,
5 if you were doing 30 or 50 of them, there would be a
6 clear ability to see that the reference COLA and
7 subsequent COLA structure does yield efficiencies?

8 MR. AKSTULEWICZ: So, I believe that if
9 you could do that, you would find that efficiency.

10 My own personal experiences, when we were
11 transitioning from the Phase II to Phase IV to Phase
12 VI or, in this case, Phase B to D, you could see the
13 ease at which the safety evaluation was being
14 developed and those areas where there were no ongoing
15 reviews because everything was either standard
16 language from a previous application that had been
17 approved or was part of the certification that all you
18 were dealing with were those very specific chapters
19 that were site specific.

20 CHAIRMAN SVINICKI: And, the phases for
21 those who aren't familiar is that the NRC staff
22 undertakes a phased review. Could you just describe
23 that briefly?

24 MR. AKSTULEWICZ: Sure.

25 So, for a reference COLA, we use a six

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1 phase review. The first phase is a Request for
2 Information. The second phase is the development of
3 a safety evaluation with open items.

4 A third phase is an ACRS review. A fourth
5 phase is the completion of the safety evaluation by
6 closing all of the open items.

7 The fifth phase is a revisiting with the
8 ACRS again on matters that were open at the time.

9 And, the sixth phase is the final
10 reconciliation of all outstanding issues in terms of
11 a confirmatory nature that completes the licensing
12 record for the application.

13 For a subsequent COLA, we use a four
14 phased A, B, C and D. A is very similar to Phase I,
15 it's a question and answer response phase.

16 Phase B is the development of the safety
17 evaluation with open items.

18 Phase C is a visiting with the ACRS on
19 matters of technical nature.

20 And, Phase D is the completion of the
21 safety evaluation that resolves all open issues.

22 CHAIRMAN SVINICKI: Okay, thank you for
23 that.

24 The other topic I would ask you to perhaps
25 to respond, anyone on the panel who would like to, is

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1 you heard in the panel immediately preceding yours, I
2 asked the Applicant about kind of institutional
3 knowledge keeping that together on a going forward
4 basis.

5 And, the cases -- the case of the NRC
6 staff, of course, is the Commission has approved to
7 the merge of the Office of New Reactors with the
8 Office of Nuclear Reactor Regulation. So, you know
9 you're facing a restructuring on the NRC side of the
10 house.

11 So, how is the staff, at a high level,
12 approaching the same need to maintain a core and
13 institutional knowledge should applicants, upon being
14 granted licenses, decide ten years down the road to
15 construct -- to initiate construction of the units?

16 MS. ORDAZ: Thank you.

17 I would offer that we have a number of
18 procedures in place currently. They have been revised
19 over time and they're going to continue to be revised
20 as we're learning lessons through these reviews.

21 Many of the staff that have been involved
22 through the years, I would offer Frank to my right
23 here, has been involved since day one.

24 I've had some experience in the past four
25 hearings and but the staff behind us and around this

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1 room, I asked this morning when we did roll call for
2 the witnesses, how many have been involved up to this
3 point. And, there was quite a few hands in the air.
4 So, many of the folks around this room have been
5 involved since the very first time and also have had
6 been here -- have been here for previous hearings.

7 So, we can't always declare that they're
8 going to be here in future COLs, however, and there
9 are no future ones on the horizon at the moment, but
10 what we're trying to do is ensure that the procedures
11 that we have in place continue to be updated, learning
12 lessons.

13 And, when we take the opportunity,
14 continuously to look back and factor those lessons
15 into our procedures such that is there is that
16 opportunity for a future COLs, we'll have turn over,
17 we'll have dialogue and we'll be able to preserve
18 knowledge.

19 CHAIRMAN SVINICKI: Thank you for that.

20 And, I would note that upon the issuance
21 of the Commission's decision in this particular
22 mandatory hearing, NRC does and new reactors achieves
23 a significant milestone in the wrapping up of their
24 work on the pending COL.

25 So, I think we will hit a different phase

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1 here in terms of keeping institutional knowledge.
2 And, we will, of course, make use of the very capable
3 team that has worked on this in other capacities and
4 as they move on to different assignments, we'll have
5 the same challenge as the Applicant.

6 So, we'll have to maintain some focus on
7 that. Of course, the notion of maintaining
8 institutional knowledge is not something new for NRC.
9 We do this on the operating reactor side and with
10 other materials licensees. So, I'm very confident
11 that the NRC staff will be able to keep the right
12 knowledge management instruments in place.

13 With that, I would note, if my colleagues
14 don't -- haven't thought of anything else that they
15 care to raise, we will now take a short break. And,
16 I think I'm going to give us until quarter to so that
17 we may reset for the first safety panel and stretch
18 our legs a bit.

19 So, we will reconvene at 10:45.

20 Thank you.

21 (Whereupon, the above-entitled matter went
22 off the record at 10:36 a.m. and resumed at 10:45
23 a.m.)

24 CHAIRMAN SVINICKI: Thank you, everyone.
25 I now call the hearing back to order. We will now

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1 conduct the Safety Panel, which as I have described is
2 the first of the joined panels that will begin with
3 the FPL witnesses and then continue with the NRC staff
4 witnesses.

5 The parties will address relevant sections
6 of the application and two chapters in particular from
7 the Final Safety Evaluation Report, Chapter 2
8 regarding site characteristics, including a novel
9 issue associated with storm surge and sea level rise,
10 and Chapter 11 regarding radioactive waste management,
11 including a novel issue associated with the use of
12 deep well injection for liquid radioactive waste
13 disposal.

14 In connection with the staff's discussion
15 of the liquid rad waste disposal issue I note that in
16 the contested portion of this proceeding, which
17 proceeded separately from today's hearing and has been
18 completed, the Atomic Safety and Licensing Board
19 considered an environmental issue designated
20 contention 2.1.

21 The proponents of that contention argue
22 that certain specified chemical concentrations in the
23 wastewater proposed to be injected into the wells
24 could adversely affect groundwater should they migrate
25 into the Upper Floridan Aquifer and that the staff's

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1 Environmental Impact Statement therefore incorrectly
2 concluded that the environmental impacts from the
3 wells would be small.

4 Following an evidentiary hearing on this
5 contention the Licensing Board concluded in a decision
6 designated LBP17-5 that the staff did in fact
7 demonstrate that the environmental impacts from the
8 injection wells would be small.

9 This specific issue has been finally
10 determined and is not part of the Commission's
11 consideration of the staff's review in the uncontested
12 portion of this proceeding.

13 I will now begin by asking the panelists
14 to introduce themselves, and we will begin with FPL.
15 Please proceed.

16 MR. FRANZONE: Good morning. This is
17 Steve Franzone, Licensing Manger.

18 MR. JACOBS: Paul Jacobs, Engineering
19 Supervisor.

20 MR. ORTHEN: And Richard Orthen, Licensing
21 Engineer.

22 CHAIRMAN SVINICKI: Thank you. Please
23 proceed with the FPL presentation.

24 MR. FRANZONE: Good morning,
25 Commissioners, this is Steve Franzone. Slide 2,

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1 please. Okay.

2 If I may draw your attention to the blue
3 at the bottom right of the figure on Slide 2 this
4 represents the nominal sea level of Biscayne Bay and
5 26 feet above that is our plant design grade.

6 To paint the final plant design grade we
7 started by reviewing different scenarios identified in
8 NRC guidance, such as floods, rains, tsunami, and
9 storm surge.

10 The limiting event which could impact this
11 site was determined to be the probable maximal storm
12 surge. If we look at the figure it identifies the
13 three components of the surge water level.

14 First we need a sea level which to base
15 our storm surge computation. We have conservatively
16 used an antecedent water level of 3.6 feet NAVD-88,
17 which is the elevation standard.

18 The two components which make up this
19 value are the 10 percent exceeding high spring tide
20 and an added one foot projection for sea level rise.
21 The one foot for sea level rise was calculated by
22 using the local relevant data to determine the actual
23 trend for South Florida following NRC guidance.

24 We used data from the closest available
25 tide station to determine our sea level rise and

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1 reviewed more recent data from tide stations that were
2 farther away to see if there was a higher rate of
3 change in the more recent data.

4 We were able to confirm our value was
5 conservative. Accordingly, this adjusted initial
6 water level condition was then used in our surge model
7 simulations.

8 The analysis of the controlling storm
9 surge included parameters such as storm track, wind
10 feels, direction of wind approach, and bottom effects,
11 and resulted in a value of 17.5 feet.

12 These parameters exceeded the documented
13 historical parameters at the site. We conservatively
14 added a factor of 20 percent for uncertainty to the
15 model results.

16 We showed that the model accurately
17 represented site conditions by benchmarking using
18 events such as Hurricane Andrew. Our last component
19 of our surge water level is wave run-up.

20 Wave run-up is calculated using a
21 conservative model which yield a value of 3.7 feet.
22 Therefore when we add these components together that
23 equals 24.8 feet, that we then added 1.2 feet of
24 additional conservatism to obtain the plant design
25 grade of 26 feet.

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1 In conclusion, NRC guidance provides a
2 conservative method for determining the potential
3 surge for a site by adding conservatism to each
4 individual component, the result is a conservatism
5 plant design elevation.

6 Slide 3, please. Okay. All wind is not
7 created equal. For other sites the DCD site parameter
8 value of 300 mile per hour tornado wind speed is the
9 limiting site characteristics.

10 Based on new NRC guidance we investigated
11 missiles generated by hurricane winds which had the
12 potential for our site to be more limiting than
13 missiles generated by a tornado due to the straight
14 line winds in a hurricane.

15 We reviewed potential hurricane missiles
16 generated by our one in 10 million year hurricane wind
17 speed of 260 miles per hour which was taken from their
18 figure you see here.

19 Using the same methodology as described in
20 the DCD the hurricane missiles were evaluated and
21 found acceptable. Another wind design parameter is
22 the operating basis wind speed which is used to
23 establish the loads which could be applied repeatedly
24 without interrupting operation.

25 We determined for our site that basic wind

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1 speed is approximately 150 miles per hour, which is
2 five miles per hour greater than the DCD value of 145
3 miles per hour.

4 These are the winds expected to occur
5 every 50 years. However, since the wind loads are a
6 small contribution to the total applied loads to plant
7 safety-related structures the small increase is
8 acceptable.

9 And, finally, for Turkey Point 6 and 7 and
10 likewise for the existing units we will actually shut
11 down the plant in advance of the site being impacted
12 by Category I hurricane winds, which translate to
13 sustained winds of 74 to 95 miles per hour in
14 accordance with our emergency plan.

15 Thank you. I will now turn the
16 presentation over to Paul Jacobs, our Engineering
17 Supervisor.

18 MR. JACOBS: Good morning, Commissioners.
19 Slide 4, please. Let's see. As Steve mentioned
20 earlier FPL proposed a different method of liquid
21 effluent discharge for Turkey Point Units 6 and 7.

22 The process for collecting plant waste
23 streams performing the required dilution and the
24 release of the waste stream is standard practice for
25 all plants.

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1 The difference for Turkey Point Units 6
2 and 7 is rather than releasing the waste stream to
3 surface water we will release the waste stream to the
4 boulder zone.

5 The boulder zone is an extremely permeable
6 zone in a southeast region of Florida that is capable
7 of receiving large liquid waste quantities.

8 The use of the boulder zone for injection
9 of treated sewage, industrial and domestic waste, is
10 permitted by the Florida Department of Environmental
11 Protection.

12 The boulder zone is overlain by a
13 confining unit which will prevent upward movement of
14 the injected waste. The boulder zone has been in use
15 for disposal of liquid waste since 1943 and there were
16 over 180 permitted Class I injection wells.

17 The basic construction of the injection
18 well consists of a series of concentric casings that
19 are placed at various depths. Each of the casings is
20 cemented in place to isolate the various geologic
21 zones.

22 The depths of each size of casing are
23 determined by the geology of the site and Florida
24 regulatory requirements. The 24-inch and 34-inch
25 casing is placed to provide double protection of the

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1 underground source of drinking water.

2 FPL will install six pair of injection
3 wells. Each pair of injection wells will have a dual
4 zone monitoring well. The dual zone monitoring well
5 is an early detection system used to identify if
6 injectate is migrating upward from the boulder zone.

7 Slide 5, please. Slide 5 contains a cross
8 section of a typical deep well injection arrangement,
9 well arrangement. The figure is not to scale and is
10 intended to point out significant features of the well
11 system.

12 This official well shown in the upper left
13 is simply shown for scaling purposes. The system
14 shown includes an injection well, IW-1, and an
15 associated dual zone monitoring well, DZMW-1.

16 As shown the injection well extends from
17 grade to approximately 3000 feet below land surface.
18 The actual depth of the injection well system that
19 will be installed at Turkey Point will be determined
20 for each well based on the specific well site but
21 should be between 2900 and 3500 feet below land
22 surface.

23 To offer some perspective I would like to
24 point out some of the relevant elevations to
25 demonstrate the features that make the use of these

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1 wells a safe and reliable method of release.

2 The base of the underground source of
3 drinking water is approximately 1450 feet below land
4 surface. The injection elevation is 3000 feet below
5 land surface.

6 Between the injection point and the
7 underground source of drinking water is an area
8 designated as the Middle Floridan Confining Zone. The
9 layer is approximately 1000 feet thick and has a very
10 low hydraulic conductivity that prevents flow through
11 the confining layer.

12 The likelihood of any fluid from the
13 injection zone rising into the underground source of
14 drinking water is very small because the confining
15 layer is thick and has low porosity.

16 Mr. Orthen will now describe the
17 assessment FPL performed to determine how injection
18 might affect the safety of members of the public.

19 MR. ORTHEN: Slide 6, please. Good
20 morning. I will now talk a bit about FPL's work
21 assessing the public safety implications of a
22 non-traditional method of disposing the plant's
23 radioactive liquid effluent using the injection wells
24 Paul just described.

25 The combination of the natural barriers

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1 preventing access to this deep saltwater formation
2 coupled with relatively stagnant movement of water
3 down there make this formation a very attractive
4 alternative to surface water disposal.

5 These features quite simply minimize the
6 prospects for human exposure and for the reasons Paul
7 described we would not expect any member of the public
8 to ever come in contact with this water.

9 But the NRC asked the question what if and
10 so FPL conducted an extremely conservative dose
11 assessment to demonstrate compliance with the NRC's 10
12 CFR 50 Appendix I ALARA dose objectives under highly
13 unlikely circumstances.

14 Because dose assessment methods for
15 effluents released to surface water are not directly
16 applicable to subsurface injection FPL developed a new
17 modeling approach coupling groundwater transport in
18 sites with traditional maximally exposed member of the
19 public dosimetry approaches.

20 We developed several receptor exposure
21 scenarios along the way postulating extraordinary
22 events and assumptions, abnormal situations if you
23 will, in order to hypothetically and maximally expose
24 a member of the public to the injected effluence.

25 These abnormal situations were needed

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1 because the ordinary expected injection practice would
2 confine for decades the effluent within the saltwater
3 formation with no reasonable or practical means for
4 exposure. Then we decided which of these abnormal
5 situations would deliver the highest dose.

6 In summary, FPL's modeling design was
7 conservatively established to define a very unlikely
8 sequence of events and human activities associated
9 with an abnormal, highly unexpected exposure
10 situation.

11 Through a careful screening and selection
12 process FPL found that the worst case scenario
13 involved an unusual person who is both a well driller
14 and a subsistence farmer living about two miles away
15 from Units 6 and 7.

16 FPL hypothesized that in this particular
17 situation the subsistence driller would ignore all
18 notification and permitting requirements for a large
19 and expensive drilling operation and develop a well
20 hundreds of feet deep into the brackish Upper Floridan
21 Aquifer to supply water for drinking and production
22 and consumption of food stuff, such as garden
23 vegetables, beef, and milk.

24 To add to this conservatism we placed this
25 well directly above a hypothetical failure in the

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1 lowermost confining barrier above the saltwater
2 disposal formation, in essence, short circuiting
3 direct access to the Unit 6 and 7 effluence.

4 Despite this being a worst case situation
5 and an extremely unlikely scenario the subsistence
6 driller's dose was found to be less than a few
7 millirem per year, in compliance NRC's Appendix I
8 limits.

9 Because the slow horizontal movement of
10 effluent in a saltwater formation also ensures long
11 periods of radioactive decay before arriving below the
12 subsistence driller's location we are confident this
13 analysis is both conservative and bounding.

14 Slide 7, please. This ends my
15 presentation. Thank you.

16 CHAIRMAN SVINICKI: Thank you. I would
17 now ask the NRC staff panelists to please occupy the
18 spaces behind their name cards. Please introduce
19 yourselves and proceed with the staff's presentation.
20 Thank you.

21 MR. COMAR: Good morning. I am Manny
22 Comar.

23 MS. SMITH: Good morning. Ellen Smith.

24 MR. GIACINTO: Good morning. Joseph
25 Giacinto.

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1 MR. GRAN: Zach Gran with Health Physics.

2 MR. COMAR: Good morning, Commissioners.

3 My name is Manny Comar and I am the Lead Project
4 Manager for the staff review of Florida's Turkey Point
5 Units 6 and 7 Combined License Application review.

6 Slide 2, please. Joining me on the safety
7 panel are Joseph Giacinto and Mr. Zachary Gran of the
8 NRC staff and Ms. Ellen Smith of the Oak Ridge
9 National Lab.

10 Slide 3, please. During this panel Mr.
11 Giacinto and Ms. Smith will discuss the storm surge
12 and sea level rise and Mr. Gran will discuss deep well
13 injection for the liquid radioactive waste disposal.

14 I will now turn over the presentation to
15 Mr. Joe Giacinto and Ellen Smith.

16 MR. GIACINTO: Thank you, Manny. My name
17 is Joseph Giacinto and I am NRC's Lead Hydrologist for
18 the staff's review of the Turkey Point Units 6 and 7
19 Combined License Application.

20 With me is Ms. Ellen Smith who is a
21 hydrologist on the research staff at Oak Ridge
22 National Laboratory. Our testimony will focus on the
23 external flood causing mechanism of storm surge and
24 its related components.

25 Within 10 CFR Part 50 Appendix A General

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1 Design Criterion II requires consideration of the most
2 severe national phenomena historically reported for
3 this site and surrounding area in establishing the
4 plant design basis.

5 In regard to the potential for external
6 flooding from storm surge the storm surge resulting
7 from Hurricane Andrew in August of 1992 remains the
8 highest of record in the State of Florida, including
9 consideration of preliminary data on the recent series
10 of 2017 hurricanes.

11 Hurricane Andrew was a Category 5 storm
12 which is the most severe hurricane category with
13 associated winds of 157 miles per hour or greater.
14 Passing through Homestead, Florida, Hurricane Andrew
15 made landfall approximately eight miles north of the
16 Turkey Point site.

17 The hurricane produced a maximum storm
18 surge of 15.4 feet north of the site and a storm surge
19 elevation of three to four feet at the Turkey Point
20 site.

21 We will move on to the staff's review of
22 the storm surge analyses with the next few slides
23 presented by Ms. Ellen Smith.

24 MS. SMITH: Thank you, Joe. Good morning,
25 I am Ellen Smith, a hydrologist at Oak Ridge National

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1 Laboratory and the Lead Technical Reviewer for surface
2 water in support of NRC's staff review of the Turkey
3 Point Units 6 and 7 COLA.

4 Slide 5, please. FPL's analysis for storm
5 surge modeled a Probable Maximum Hurricane, or PMH,
6 consistent with NRC guidance and Standard Review Plan
7 2.4.5 of NUREG-0800 using the combination of hurricane
8 parameters that yields the highest storm surge at
9 Turkey Point.

10 This PMH is much more severe than
11 Hurricane Andrew. The calculated storm surge height
12 from this PMH was then increased by 20 percent to
13 account for uncertainty.

14 The staff confirmed FPL's modeling results
15 and confirmed that the FPL analysis also includes
16 other conservatisms specified by NRC guidance.
17 Specifically, the analysis used as the peak surge that
18 occurs in an extreme high tide coincident with the
19 highest recorded sea level anomaly in the area and
20 that includes an allowance for sea level rise, which
21 is discussed in the next slide.

22 Wave run-up on top of the surge was
23 calculated as 3.7 feet based on using conservative
24 straight line constant winds from a storm with wind
25 speeds higher than the threshold for a Category 5

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1 hurricane.

2 The resulting total flood hazard elevation
3 from storm surge was calculated to be 24.8 feet at the
4 site, which is 1.2 feet below the design grade of 26.0
5 feet. An ITAAC requires FPL to verify the design
6 plant grade elevation.

7 Slide 6, please. Sea level rise is one
8 component of the storm surge calculation, which is
9 expanded upon in this slide.

10 NRC guidance and Standard Review Plan
11 2.4.5 indicates that information from sea level
12 records should be considered in flood analysis for
13 coastal sites and JLD-ISG-2012-06 recommends using
14 observed sea level trends at nearby tide gauge
15 stations as a basis for estimating sea level rise,
16 future sea level rise.

17 The National Oceanic and Atmospheric
18 Administration, or NOAA, maintains a network of tide
19 stations and publishes tide and sea level data from
20 those stations.

21 Miami Beach is the nearest station to the
22 Turkey Point site that has a period of record long
23 enough to span multiple multi-decade tidal cycles.
24 NOAA's data analysis shows that sea level there is
25 rising at a rate of 0.78 feet per century.

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1 NRC staff reviewed the data and the
2 analysis and confirmed this trend. The Miami Beach
3 station was removed from service in 1981 but Transit
4 Miami Beach are well correlated with Transit Key West
5 where NOAA tide records are available from 1913
6 through 2016.

7 Informed by the observed data and NRC's
8 guidance FPL estimated a rise of 1.0 foot to account
9 for sea level change over the life of the Turkey Point
10 Units 6 and 7 nuclear plant.

11 The staff notes that sea level change is
12 observable and gradual, so if sea level rise should
13 exceed this estimate there would be opportunities to
14 reevaluate the situation and take additional action if
15 warranted.

16 Slide 7, please. In summary, the heights
17 of the various components of the calculated flood
18 hazard elevation are high tide plus sea level anomaly
19 at 2.6 feet, sea level rise at 1.0 feet, storm surge
20 with an added 20 percent uncertainty at 17.5 feet, and
21 wind wave run-up at 3.7 feet, for a total flood hazard
22 elevation of 24.8 feet, which is 1.2 feet below the
23 design grade elevation.

24 Sea level rise is only one component in
25 this flood hazard elevation and therefore any

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1 discussion of the relative merits of the sea level
2 rise component should also consider any conservatisms
3 from other parameters that contribute to the overall
4 design basis flood height. Thank you. Now to Joe.
5 Slide 8, please.

6 MR. GIACINTO: Thank you, Ellen. The
7 storm surge estimate exceeds the surge from the most
8 extreme historical event. Considering the multiple
9 layers of conservatism in the storm surge analysis the
10 NRC staff concluded that the design basis value of
11 storm surge flood height is appropriate and reasonably
12 conservative.

13 Because the design basis flood elevation
14 does not inundate the design plant grade it will not
15 affect safety-related structures, systems, and
16 components.

17 I will now turn the presentation over to
18 Mr. Zachary Gran for a presentation of deep well
19 injection for liquid radioactive waste disposal.

20 MR. GRAN: Thank you. Slide 9, please.
21 Good morning.

22 COMMISSIONER BURNS: Could you move your
23 mic a little closer?

24 MR. GRAN: Okay. How's that?

25 (No audible response)

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1 MR. GRAN: Good morning. My name is
2 Zachary Gran and I am a Health Physicist in the Office
3 of New Reactors. I am the lead reviewer for Chapter
4 11, Waste Management Systems, for the Turkey Point
5 COLA.

6 I will be presenting the staff's review of
7 the maximum potential dose resulting from the deep
8 well injection method proposed by FPL.

9 FPL is proposing to use deep well
10 injection to dispose of liquid effluent instead of
11 disposal into surface water. This design feature has
12 been designated as novel as it represents the first
13 use of such a disposal method by a nuclear power plant
14 in the United States.

15 10 CFR 20.2002 describes the information
16 required for obtaining approval of a proposed disposal
17 method.

18 Slide 10, please. First, some background
19 on deep well injection. The injection will be into
20 the boulder zone of the Lower Floridan Aquifer which
21 is a cavernous, high permeability, saline zone located
22 over 3000 feet below the surface at the site.

23 The salinity of water within the boulder
24 zone is roughly the same as sea water. Water within
25 the boulder zone is kept separate from the overlying

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1 brackish Upper Floridan Aquifer by around 1500 feet of
2 low permeability dolomitic limestone and dolomite.

3 This low permeability zone is referred to
4 as the Middle Confining Unit of the Floridan Aquifer
5 System and is relied upon in Florida to provide
6 confinement of injected wastewaters.

7 In the vicinity of the site water within
8 the Upper Floridan Aquifer is brackish and would
9 require treatment before drinking.

10 Slide 11, please. Deep well injection of
11 both municipal and industrial wastewater is widely
12 used in the State of Florida in part because of laws
13 that limit releases to surface water bodies.

14 Currently there are over 180 deep
15 injection wells, which are also known as Underground
16 Injection Control wells, permitted by the State of
17 Florida under authority delegated from the
18 Environmental Protection Agency.

19 At the Turkey Point site FPL proposes to
20 install 12 Class I underground injection control wells
21 and six dual-zone monitoring wells located between
22 each injection well.

23 Slide 12, please. Given the nature of the
24 discharge method it was necessary for FPL to
25 demonstrate compliance with 10 CFR 20.2002, Methods

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1 for Obtaining Approval of Proposed Disposal
2 Procedures.

3 In past reviews of applications, other
4 than for a power reactor license, the staff has
5 typically approved 10 CFR 20.2002 requests that result
6 in a dose to a member of the public that is no more
7 than a few millirem per year.

8 For this criterion the staff determined
9 that the criteria present in 10 CFR Part 50 Appendix
10 I were suitable for evaluating dose since these are
11 the criteria used to demonstrate compliance with
12 surface water disposals.

13 Slide 13, please. The staff performed an
14 independent dose analysis using radionuclide
15 concentrations provided by the Applicant.

16 The staff independently confirmed that the
17 radionuclide concentrations described by the Applicant
18 as having the highest contribution to dose were
19 conservative.

20 The staff confirmed that four
21 radionuclides, tritium, cesium-134 and cesium-137, and
22 strontium-90 contribute 99 percent of the dose from
23 the AP-1000 source term.

24 The staff identified the nearest
25 hypothetical receptor location at 2.2 miles of the

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1 site and staff considered multiple pathways as noted
2 on the slide.

3 However, the staff's analysis for
4 compliance only used the irrigated vegetable pathway
5 since no other pathway is plausible based on land use
6 practices around the site.

7 As part of the analysis of the fate and
8 transport of injected effluent from the injection well
9 to the receptor location the staff used conservative
10 primaries and assumptions in order to evaluate the
11 abounding injection scenario.

12 The conservative assumptions are discussed
13 on the next slide. Slide 14, please. This slide
14 illustrates a conceptual model of the bounding
15 transport scenario which was used to describe the
16 maximum exposure scenario at the receptor location.

17 On the right side we have the injection
18 well, which is the point at which the liquid effluent
19 is being injected into the boulder zone. Prior to
20 being injected the effluent will be diluted to meet 10
21 CFR Part 20 Appendix B, Effluent Concentration Limits.

22 In our analysis the staff used the smaller
23 of the two possible dilution sources because that will
24 result in the highest concentration of radionuclides
25 in the injected effluent.

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1 Once the water is in the boulder zone the
2 staff used conservative assumptions to minimize travel
3 times to receptors and maximize the concentrations of
4 the effluent.

5 Conservative parameters for dilution,
6 radionuclide decay, sorption, and the aquifer
7 effective porosity and thickness were all used to
8 minimize the travel time to the receptor location.

9 Staff analysis confirms that the injection
10 pressure would have a greater influence on plume
11 migration rates than the slow natural flow within the
12 boulder zone and would be the primary mechanism
13 driving transport for radionuclides once inside the
14 boulder zone.

15 Accordingly, the staff determined that the
16 maximum radionuclide concentrations at the receptor
17 well and for this does analysis the staff used the
18 maximum concentration determined for each
19 radionuclide.

20 At 2.2 miles from the site staff assumes
21 that there is a private well completed in the Upper
22 Floridan Aquifer located directly above a complete
23 breach of the Middle Confining Unit.

24 This assumption is conservative since the
25 staff analysis has determined that over the 100-year

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1 simulation the effluent would not travel more than 310
2 feet vertically through the 1500-foot confining unit.

3 The staff then calculated the dose to a
4 member of the public through the irrigated vegetable
5 pathway using the concentrations found at 2.2 miles in
6 the boulder zone.

7 Slide 15, please. Based on the staff's
8 analysis the staff determined that the calculated
9 releases were below the limits specified by 10 CFR
10 Part 20 Appendix B and 10 CFR Part 50 Appendix I.

11 The Health Physics Program required by
12 Part 20 and the ALARA Program required by Part 50
13 Appendix I are both operational programs and do not
14 have associated ITAAC in accordance with the staff
15 requirements memorandum on SECY-04-032.

16 The Applicant demonstrated compliance with
17 10 CFR Part 20 Appendix B by specifying and
18 maintaining flow rates at the blowdown sump discharge
19 corresponding to the minimum dilution factor of about
20 6000 gallons per minute per unit prior to discharge.

21 The staff confirmed the dose results
22 reported by the Applicant through independent
23 calculations. The staff confirmed that the doses were
24 below the dose objectives in 10 CFR Part 50 Appendix
25 I.

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1 And, in addition, the Applicant has
2 provided all of the information needed to demonstrate
3 compliance with 10 CFR 20.2002 by, one, providing a
4 description of the waste disposed and the manner of
5 the disposal, and, two, demonstrating compliance with
6 the limits of 10 CFR Part 50 Appendix I and the
7 maximum dose criterion of a few millirem to the
8 maximally exposed individual.

9 This concludes the staff's presentation.
10 Thank you.

11 CHAIRMAN SVINICKI: Well thank you to the
12 FPL and the staff panelists for those presentations.
13 This is the part of the day, this part and the next
14 panel where the room layout creates a slight bit of
15 awkwardness but I know we can handle it, so we do have
16 the FPL witnesses behind the staff.

17 I don't think you need to move yourselves
18 all the way. I think that there is few enough of
19 everybody that we can --

20 (Simultaneous speaking)

21 CHAIRMAN SVINICKI: Okay, all right. Well
22 Commissioner Baran has a blocked view, but okay.

23 COMMISSIONER BARAN: That's good. You're
24 good, you're good, you're good.

25 CHAIRMAN SVINICKI: Okay. And we will

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1 begin the question period of this Safety Panel with
2 Commissioner Burns. Please proceed.

3 COMMISSIONER BURNS: Well, thank you.
4 Thank you for the overview on those two issues, on the
5 deep well injection as well as the -- I think it was
6 a very interesting issue in terms of designing to
7 accommodate, or, you know, a severe, potentially
8 severe flooding events and severe weather events given
9 the experience of Turkey Point being in that very
10 strong hurricane, Hurricane Andrew in 1992.

11 Let me actually start with a couple
12 questions related to the deep well injection. I have
13 one for the Applicant and then one for the staff.

14 For FPL, I think in the response to
15 Pre-Hearing Question 18 on requirements associated
16 with the deep well injection you discussed groundwater
17 monitoring requirements imposed by the Florida
18 Department of Environmental Protection and you stated
19 that "it's expected that mechanical integrity tests in
20 the injection wells will be performed every five
21 years."

22 Can you tell me whether those tests are
23 required by the Florida Department or is there some
24 other commitment that FPL is making toward those
25 testing, that testing?

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1 MR. JACOBS: The license for the injection
2 well is renewed on a 5-year basis and prior to that
3 renewal you do a mechanical integrity test.

4 COMMISSIONER BURNS: Okay.

5 MR. JACOBS: So it is required by
6 regulations.

7 COMMISSIONER BURNS: And that's, right,
8 that's required by the Florida Department?

9 MR. JACOBS: By the environmental
10 protection regulation, yes.

11 COMMISSIONER BURNS: Okay, all right.
12 Thank you, that answered my question. And with
13 respect to the staff, as the staff, as Mr. Gran noted
14 I think this is the first circumstance in which we
15 have had for a power reactor licensee, this type of
16 mechanism or this type of design and I guess my
17 question would be that if you, did you have particular
18 guidance for reviewing deep well injection liquid
19 effluence other than what is described in Part 20 and,
20 you know, I think, yes, you also mentioned some
21 documents on Slide 12, was there other experience and
22 other circumstances or industries that you took into
23 account in making your assessment?

24 MR. GRAN: Yes. Like you point out the
25 few millirem criteria is where started off.

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1 COMMISSIONER BURNS: Yes.

2 MR. GRAN: We're trying to assess the dose
3 criteria. For normal reactors with the service water
4 disposal we had our, we previously had our computer
5 codes that we would use to do those dose analysis and
6 we could leverage some of the dose conversion factors,
7 the consumption factors, all these various injection
8 pathways to determine the dose.

9 For this one it was definitely a bit
10 different. I can only speak from the radiological
11 point of view and maybe the -- If you want more
12 details on the water transport we can refer to someone
13 else, but for us it was really how we get the
14 concentrations in the boulder zone.

15 But once we figured out what the
16 radioactivity was inside the boulder zone determining
17 the dose to a member of the public was somewhat
18 similar to what we normally would do.

19 COMMISSIONER BURNS: Okay. Okay, all
20 right. Thank you. Let me turn to some questions
21 related to dealing with storm surge and the impact of
22 weather conditions and potential flooding.

23 There was some illusion -- or I think
24 actually, Mr. Giacinto, you referred to that we have
25 looked preliminarily at data from the 2017 hurricane

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1 experience, which as you noted I think, I think you
2 testified that it's less, the parameters or the
3 characterization of those events, the hurricane
4 events, is less than that of Andrew, correct?

5 MR. GIACINTO: That is correct. We looked
6 at the data for the 2017 hurricanes which some of it
7 is preliminary but from the existing data that we have
8 looked at the surge from those 2017 hurricanes was far
9 below anything that PMH would approach.

10 COMMISSIONER BURNS: Okay. What's the
11 nature, as you said what we have is in effect
12 preliminary data, which doesn't surprise me given
13 these events were only within the last couple of
14 months, what other, what is the data to come and
15 maybe, Ms. Smith, you --

16 MS. SMITH: Well typically the data on the
17 storm surge from a hurricane event is largely based on
18 places where people found debris.

19 COMMISSIONER BURNS: Yes.

20 MS. SMITH: So in the immediate aftermath
21 of the hurricane we did have some tide records where
22 they weren't knocked out. The records in Puerto Rico
23 were largely lost, but the numbers from the gauges are
24 typically less than the numbers you end up with later
25 on when somebody does a detailed retrospective.

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1 The highest value I have seen for storm
2 surge in Florida from this year's hurricanes was a
3 news report indicating about ten feet of surge in the
4 Florida Keys from Hurricane Irma.

5 The highest measured surge was at
6 Jacksonville and was about 7-1/2 feet above the tide
7 level and then the tide was fairly high, so it was
8 probably in the same order totally when you added tide
9 to surge, but those numbers are well below the kinds
10 of numbers we are talking about.

11 COMMISSIONER BURNS: Okay. Now would the
12 Applicant have anything it would like to add on this
13 question of where we are in terms of preliminary?

14 MR. FRANZONE: No, I think you accurately
15 portrayed it though.

16 COMMISSIONER BURNS: Okay. Perhaps one if
17 I can cut through my notes and find it. Again, Ms.
18 Smith, you talked about sort of historical
19 observations with respect to sea level rise and it was
20 something like about three-quarters of a foot or 0.77,
21 0.78 feet rise over the, about the last century.

22 Are there -- In terms of looking at data
23 given, you know, it's something we almost read about
24 in the paper every day issues of sea level rise, two
25 things I would say.

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1 Do we have indications that suggest a
2 greater, a more rapid sea level rise although given in
3 context I think when you say this is something you can
4 watch, or, you know, it's not suddenly you're going to
5 have tomorrow a 3-foot rise in sea level, it's
6 something, it progresses over time, but do we have
7 indications of an acceleration of sea level rise?

8 MS. SMITH: Well there certainly have been
9 some people who have been reporting observations that
10 indicate a higher rate of sea level rise, but most
11 predications of higher sea level rise are still based
12 on somebody's model analyzing the factors that are
13 expected to lead to the rise.

14 COMMISSIONER BURNS: Okay.

15 MS. SMITH: And data interpretation on sea
16 level rise is a lot more complicated than a person
17 might immediately assume.

18 There are all sorts of factors that create
19 noise in the data so it is very difficult to actually
20 evaluate what is affecting sea level rise on a global
21 scale or locally.

22 So this is something that is -- We're
23 going to know more in the future, but at the moment
24 the data, the observed data are what we have and the
25 linear fit was the best way we can interpret the

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1 historical data.

2 COMMISSIONER BURNS: Did you want to add
3 something, Mr. Giacinto?

4 MR. GIACINTO: Yes, I'd just like to add
5 there have been -- Sea level rise is an evolving
6 science and as such characterization of sea level rise
7 literature by the federal government and also the
8 inter-governmental panel on climate change are
9 published every few years to review the state of the
10 science and new information.

11 So to that end, NOAA recently published a
12 national climate assessment in 2017 and their likely
13 range of sea level rise to 2100 was one foot to 4.3
14 feet.

15 COMMISSIONER BURNS: Say that again for
16 me, please, one foot to --

17 MR. GIACINTO: 4.3 feet.

18 COMMISSIONER BURNS: 4.3 feet, okay.

19 MR. GIACINTO: To 2100, yes.

20 COMMISSIONER BURNS: And my final question
21 related to that then is given what the staff has
22 analyzed and the models that the Applicant has used
23 and with the staff's conclusions am I correct in
24 assuming that the design parameters used are
25 conservative enough to account for that level of rise?

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1 MR. GIACINTO: Yes, it's very
2 conservative. We have a PMH hurricane with an
3 intensity that has never been seen before in the
4 continental United States, a landfall.

5 The intensity is well beyond the Category
6 5 threshold. We have a PMH that is approaching the
7 boundaries of physics quite frankly for the Atlantic
8 Ocean and we assume no weakening of the storm at
9 landfall, which is typically the case for a large
10 storm.

11 We added extreme high tides to the
12 analysis. The Applicant had a simulation program that
13 actually tends to over predict intense hurricanes,
14 such as the PMH, and on top of that we added the 20
15 percent margin and we added the sea level rise to that
16 and all resulting in a storm surge that is over nine
17 feet higher and 40 percent greater than the storm
18 surge of record from Hurricane Andrew in Florida.

19 COMMISSIONER BURNS: Okay. Thank you very
20 much. Thank you, Chairman.

21 CHAIRMAN SVINICKI: Well thank you again
22 for your presentations. I will begin with a question
23 for the Applicant.

24 Before I do that though I want to note
25 that the Commission asked a number of pre-hearing

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1 questions to both the staff and the Applicant and I
2 did find that the responses were both thorough and
3 very clear, not that they haven't been in other
4 mandatory hearings, but I want to compliment both
5 parties.

6 I thought that they were very illuminating
7 and as a result I don't have questions on a number of
8 very important areas, but I think that the record is
9 very strong in those areas.

10 I did have a couple of items outside of
11 that though. The first for the Applicant is the
12 Applicant adopted an approach of a consolidated
13 technical support center consolidated with the
14 emergency operations facility that would service both
15 the existing nuclear units at Turkey Point and the
16 AP-1000 units if they were constructed.

17 Now there are technology differences of
18 the AP-1000 with the current generation of operation
19 reactors. What were the pluses and minuses that the
20 Applicant considered in requesting that approach and
21 why did you arrive at your request to have the
22 consolidated center?

23 MR. FRANZONE: Okay. This is Steve
24 Franzone. Thank you, it's a good question. When you
25 look the site the existing units have been there for

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1 a while, their TSC is located inside the protected
2 area.

3 When we looked at the new Units 6 and 7 we
4 tried to not just look at Turkey Point 6 and 7 alone
5 because our emergency plan actually we transitioned
6 from an individual site emergency plan to the, I mean
7 an individual unit to a site, and so that was one of
8 the considerations when we looked at placing a tech
9 support center.

10 We wanted to do it locally, centrally
11 between the both units. We could actually take
12 advantage really of new technology for the existing
13 units since they would be operating at the same time
14 period.

15 The other thing that we had, we wanted to
16 do was FPL's experience at having, you know, a tech
17 support center combined was -- I thought we had the
18 experience that we thought having a tech support
19 center for all four units would be more efficient in
20 a lot of ways.

21 It can support an incident at both the 3
22 and 4, the existing units, and then 6 and 7, so that
23 wasn't a problem. Let me think. I think that
24 generally answers the question.

25 CHAIRMAN SVINICKI: Okay, thank you. And

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1 for the staff, there is this metric on population
2 density that is considered, it is I think exists in
3 NRC guidance, it's a density criterion of 500 people
4 per square mile for the siting of nuclear power plants
5 and this was somewhat of a complex issue for the
6 staff.

7 I think that there were -- Well I should
8 back up and say that it isn't really a hard
9 requirement not to exceed the 500 person and it says
10 if the proposed location "significantly exceeds 500
11 people per square mile" and then it doesn't define
12 significant so the staff has to use some expert
13 judgement there as well.

14 But could the staff clarify at all what
15 the source of 500 is and how did the staff approach
16 that technical judgement about significantly exceeding
17 500?

18 MR. NAZER: I am going to ask Rao Tammara
19 here, to come up to the podium to --

20 CHAIRMAN SVINICKI: Oh. And, again, as
21 you approach the podium would you state your full
22 name, your organizational affiliation within NRC, and
23 whether or not you have been sworn.

24 MR. TAMMARA: My name is Seshagiri Rao
25 Tammara. I am with the DSEA, NRO. I am the lead

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1 reviewer for the external hazards in population
2 distribution.

3 CHAIRMAN SVINICKI: And you have been
4 sworn as a witness? You have been sworn in as a --

5 MR. TAMMARA: Yes, I am sworn in, yes

6 CHAIRMAN SVINICKI: Yes, thank you.

7 MR. TAMMARA: According to the regulation
8 100.21(h) the regulation says the nuclear unit
9 preferably to be located at a low density area not
10 really highly dense area.

11 In doing so there is another way, another
12 step you can look at provided not in a dense area if
13 safety environmental and other considerations can be
14 feasible you can locate but the regulation did not
15 specify a value that it should exceed other -- you
16 know, within that point, but they left it that way so
17 that preferably it should not be a very densely area.

18 But later on when the 4.7 guidance was
19 provided the guidance was given preferably a nuclear
20 unit should be located from the date of the initial
21 approval within five years thereafter the people
22 should be, the density should be within 500 people per
23 square meter within the 20 miles from the reactor site
24 in any radial distance -- average road and radial
25 distance. That was the guidance.

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1 So but the guidance also says if this
2 exceeds not well in excess of 500 you can demonstrate
3 that the safety, environmental, and other
4 considerations are favorable or outweigh the density
5 criterion can be real -- or overlooked.

6 So that is the gist of the guidance which
7 has given. So if the 500 is a preferred value for the
8 review of the application, if it exceeds, not well in
9 excess, still it can be pursued. That is the way the
10 guidance is developed.

11 So when we look at the Turkey Point
12 obviously it exceeded 500 within 20 miles, so then we
13 projected what should -- you know, so we went a little
14 bit more closely, we're looking at the zero to five
15 miles, zero to ten miles, zero to 20 miles, and we
16 looked at the density, estimated the density, so the
17 density varied from 58 to 518, 718.

18 So then staff considered and determined
19 200 above the preferred value is not well in excess,
20 therefore -- and also in the connection they evaluated
21 the sites on the safety, environmental, and other
22 considerations.

23 In addition, this is only the guidance but
24 the environmental planning and other ones are also
25 being evaluated in other areas and they are updated

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1 every five years, so these all went into the thinking
2 and then the staff considered it is acceptable.

3 CHAIRMAN SVINICKI: Okay.

4 MR. TAMMARA: That is the basis for it.

5 CHAIRMAN SVINICKI: Okay. Thank you very
6 much for that answer. And now I will turn to
7 Commissioner Baran for any questions he might have and
8 the time he wishes to consume.

9 COMMISSIONER BARAN: Thanks. I am going
10 to consume more this time. I would like to follow up
11 on Commissioner Burns's questions about the estimates
12 of sea level rise used in the application and the
13 safety evaluation.

14 If Units 6 and 7 were licensed and
15 constructed they could potentially operate beyond the
16 year 2100 so sea level rise is a relevant issue that
17 could have safety implications.

18 In 2012 NOAA provided sea level rise
19 scenarios for the National Climate Assessment, which
20 is, of course, the federal government's authoritative
21 report on the state of climate science compared every
22 four years.

23 NOAA explained that in recent decades the
24 dominant contributors to global sea level rise have
25 been ocean warming and expansion and ice sheet loss.

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1 NOAA described four global sea level rise scenarios,
2 lowest, intermediate low, intermediate high, and
3 highest.

4 In the highest scenario the global sea
5 level rose an average of 6.6 feet by 2100. In the
6 lowest scenario the mean sea level rise was eight
7 inches by 2100.

8 NOAA stated that there was a better than
9 90 percent chance that global mean sea level rise
10 would ultimately be bounded by these two scenarios,
11 the lowest and highest scenario.

12 The lowest scenario, as was referred to I
13 think a little bit earlier, is based on a linear
14 extrapolation of the historical sea level rise rate
15 derived from tide gauge records beginning in 1900.

16 NOAA explained that the intermediate low
17 and the lowest scenario, so the two lowest scenarios,
18 are "optimistic scenarios for future environmental
19 change."

20 According to NOAA the highest scenario
21 should be considered in situations where there is
22 little tolerance for risk, for example new
23 infrastructure with a long anticipated life cycle,
24 such as a power plant, and the lowest scenario should
25 be considered where there is a great tolerance for

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1 risk.

2 As Joe mentioned earlier in January this
3 year, 2017, NOAA updated sea level rise scenarios and
4 increased the lowest scenario to one foot of sea level
5 rise by 2100.

6 So to put this in context, this one foot
7 sea level rise by 2100 reflects the low end of the
8 range of sea level rise outcomes expected under the
9 most optimistic carbon emission scenario in which net
10 emissions drop to zero later this century.

11 For the purposes of calculating the design
12 basis flood level FPL, as we have talked about, uses
13 an estimated sea level rise of one foot and according
14 to NOAA, again, one foot is what you would expect
15 under the lowest, most optimistic scenario.

16 So I want to ask the staff given the state
17 of the science why is a one foot assumption adequate?

18 MR. GIACINTO: Well sea level rise is a
19 global phenomena and staff is confident that the
20 Applicant's analysis is very conservative with an
21 adequate safety margin.

22 When you look at -- Global sea level rise
23 has implications in site-specific terms, but for the
24 Applicant's analysis there is so many layers of
25 conservatism built into the storm surge.

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1 We are, like I say we are at the
2 boundaries of physics on how big a hurricane can get
3 in terms of the Atlantic Ocean. And, also, I'd like
4 to point out in the NOAA report these sea level rise
5 scenarios are not going to, are not anticipated to
6 diverge until after 2050.

7 So until that time they are going to track
8 closely and what happens at 2050, you know, we'll see,
9 but, again, sea level is an evolving science. The
10 high estimates are based on the different scenarios
11 for emissions and temperature and things like that and
12 there is different models for those.

13 In terms of the 2012 report that has been
14 superseded by the, obviously, the 2017 report, so I
15 think the 2017 report uses that evolving science along
16 the way to get a better estimate on sea level rise
17 ranges, because they are ranges, they're not values.

18 COMMISSIONER BARAN: In my reading of the
19 2017 report is that I guess you would characterize it
20 overall as more pessimistic than the 2012 report,
21 right, because the lowest scenario went from eight
22 inches to a foot and some of the other scenarios kind
23 of expanded a bit as well.

24 MR. GIACINTO: It's difficult to project
25 sea level rise because it is noticeable on decadal

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1 scales, so you really have to look at the measurements
2 in terms of decades and you also have to look at, you
3 know, obviously, the objective of the sea level rise
4 studies and the science behind those predictions as
5 well, so it's variable.

6 COMMISSIONER BARAN: And so when I look at
7 Slide 7 of the staff's slides which has the storm
8 surge components, I thought this was really useful,
9 what I am trying to figure out, at least initially, so
10 one element, the second from the bottom, the yellow
11 element, is future sea level rise and that's a foot.

12 And as you mentioned there are a couple
13 other areas here where there are conservatisms built
14 in. I think in the response to pre-hearing questions
15 FPL mentioned a couple of them, which is like a 10
16 percent at around the high tide, which is at the
17 bottom there, the green.

18 I guess that yielded 1.2 feet of margin.
19 They mentioned I think this design plant grade at the
20 top, which is another 1.2 feet of margin. You have
21 mentioned the middle, the hurricane storm surge and
22 the maximum probably hurricane there.

23 With respect, and understand this is just
24 one component, if we look at the future sea level rise
25 component of one foot that isn't conservative though,

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1 right? One foot isn't conservative if it is the low
2 end of the lowest scenario that NOAA has that one
3 element is not conservative I would say.

4 MR. GIACINTO: Well the value of using
5 local tide gauges for sea level rise projections are
6 that inherent in the measurements are local
7 variations, such as vertical land movement.

8 We have sediments accumulating on the
9 ocean floor creating mass loading which would depress,
10 you know, the tide gauge because it is attached to the
11 ground, or you can have erosion of land surfaces which
12 would cause uplift and you also capture the localized
13 variations in the ocean currents.

14 So the local tide gauges from the staff's
15 conversations with subject matter experts on sea level
16 rise is the best thing to use at the current time for
17 sea level projections.

18 COMMISSIONER BARAN: Okay. In August of
19 this year the Pacific Northwest National Laboratory
20 prepared a study for NRC on the potential impacts of
21 climate change on the southeastern United States.

22 It reported something that relates to one
23 of the questions Commissioner Burns had which is that
24 the rate of global mean sea level rise almost doubled
25 between 1993 and 2007 compared to the average over the

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1 20th century.

2 According to PNNL with continued ocean
3 thermal expansion and potentially more rapid melting
4 of glaciers and ice sheets in the future the relative
5 sea level along the southeastern U.S. coast is
6 projected to rise by three to six feet by 2100 under
7 an interagency intermediate one meter global mean sea
8 level rise scenario.

9 So if three to six feet relative sea level
10 rise across the southeastern U.S. coast comes from the
11 one meter or three feet global mean sea level rise and
12 that reflects that the relative sea level rise
13 projections of the east coast, including the Atlantic
14 close to Florida, are higher than the global mean in
15 every scenario.

16 FPL mentioned in their pre-hearing
17 question responses these other conservatisms and they
18 added up to a margin of a total of 3.4 feet. Did the
19 staff analyze the impacts of a three to six foot sea
20 level rise on this site?

21 MR. GIACINTO: No, the staff did not
22 analyze a three to six foot sea level rise. The
23 Applicant's analysis was very conservative with the
24 appropriate safety margin and it included sea level
25 rise and it was actually within the range of likely

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1 estimates for 2017 from the NOAA climate report.

2 And, again, you know, with a storm surge
3 of over nine feet above and 40 percent greater than
4 the historical storm surge of record staff feels it is
5 sufficiently conservative to account for variations in
6 sea level rise and also current estimates of likely
7 sea level rise.

8 COMMISSIONER BARAN: Let me ask FPL the
9 same question. You know, you have talked about the
10 complete margin of 3.4 feet, although that doesn't
11 include the probably maximum hurricane conservatism,
12 did you analyze the impacts of a sea level rise beyond
13 a 3.4 feet, such as six feet?

14 MR. FRANZONE: No. No, not as a specific
15 example in the, you know, FSAR. However, you know,
16 when you do look at it we look at the margin --

17 COMMISSIONER BARAN: Right.

18 MR. FRANZONE: -- and we knew that we had
19 a significant margin. And then even so, it's a
20 phenomena that doesn't occur overnight and so we have
21 time to observe it and we can, and the existing
22 regulatory regime and our corrective action program
23 easily allows us to evaluate if it, if say the
24 scenario of the one foot assumption that somehow
25 becomes invalid or is shown to be not conservative,

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1 and we would enter that into our corrective action
2 program and then take appropriate action at the time.

3 COMMISSIONER BARAN: In its 2017 report,
4 the latest NOAA report, it explained "the projection
5 results presented in several peer review publications
6 provide evidence to support a physically plausible
7 global mean sea level rise in the range two meters to
8 2.7 meters," or six to eight feet, "and recent results
9 regarding Antarctic ice sheet instability indicate
10 that such outcomes may be more likely than previously
11 thought."

12 So according to the climate experts at
13 NOAA and working with NOAA a 6-foot sea level rise by
14 2100 is a real possibility. I guess the question I
15 have in terms of this response of, well, if it's a
16 slow moving phenomena there is a lot of time, doesn't
17 it make sense to prepare for that possibility now at
18 the licensing stage?

19 I mean here we are, we're talking about
20 potentially licensing a piece of infrastructure that
21 could be there past 2100 shouldn't we factor this in
22 now to our analysis rather than wait and see how
23 things pan out in 40 or 50 years?

24 MR. GIACINTO: Well sea level rise, of
25 course, is recognized over decadal scales from, for

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1 example, the 1993 to 2007 estimate of doubling, that
2 might be in that period but that doesn't mean it's
3 going to double again.

4 It's a decadal pattern that you have to
5 look at. In some cases sea level rise can go up and
6 down. That's why we need to look at the decadal
7 scales, on a decadal scale.

8 So it's a variable, it's an evolving
9 science. Some of these estimates of ice sheet melts
10 are highly variable. There is a lot of factors that
11 goes into the estimate of sea level rise ranges and a
12 lot of variables that go into that and that's why
13 we're getting so many different ranges.

14 We have a thermal expansion of the ocean.
15 The ocean basin itself could change volume, you could
16 have uplift, it's a matter of the changing volumes and
17 the concentration scenarios that are presented, the
18 four that you mentioned.

19 So it is an evolving science. There are
20 potential, it potentially could rise that high, but at
21 this point in time we're not see it. It's a global
22 phenomena so it probably would be more applicable as
23 an operating fleet, maybe a generic communication to
24 a generic issue, as a safety significant issue, or
25 perhaps another avenue would be a 50.54(f) letter

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1 requesting information and direction for the
2 licensees.

3 COMMISSIONER BARAN: What I am hearing
4 from both FPL and the staff -- and if Mr. Franzone
5 wants to jump in with something else, please do -- it
6 sounds like when we look at these multiple components
7 of storm surge the staff's view and FPL's view is
8 there actually is a lot of conservatism built into
9 that, there is a lot of margin.

10 It may not be reflected on this one
11 element, but it sounds like what I am hearing is,
12 well, even if one of these higher scenarios ended up
13 coming to pass on sea level rise and we had,
14 intermediate is actually three to six feet, but if we
15 had six feet or eight feet by 2100 that there would
16 still be enough conservatism coming from maximum
17 probable hurricane and other things to make you feel
18 comfortable today at the licensing stage, is that
19 where you are at?

20 MR. FRANZONE: Yes, and I want to add one
21 more thing, is that we actually looked at newer data
22 as the result of an RAI from the NRC and we found that
23 the actual, using the same linear trend over the next
24 hundred years we actually ended up with like 0.69
25 feet, 0.70 feet using the Key West station, so it was

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1 actually less of a sea raise.

2 Now that data went from I believe 1941 to
3 2010 and so we covered that period. So I mean when,
4 you know, for us as applicants we need to use the
5 data. I mean that's really the best source of
6 information for us and based on that we used, we
7 project it, and so --

8 COMMISSIONER BARAN: And it sounds like
9 from Ellen's presentation the increase in rate, the
10 rate of increase that PNNL was reporting between 1993
11 and 2007 being double the rate of increase between
12 1900 and 1993, that's not really being reflected in
13 the gauge closest to Turkey Point, you're not seeing
14 that there.

15 MS. SMITH: The gauge closest to Turkey
16 Point was the one at Miami Beach --

17 (Simultaneous speaking)

18 COMMISSIONER BARAN: Right, yes it stopped
19 --

20 MS. SMITH: -- and it's not operated most
21 recently. The experts in interpreting these data
22 point out that data for a very short period can give
23 extremely misleading results because of the multiple
24 factors that affect sea level rise at any location or
25 globally.

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1 It's things like El Nino oscillation, La
2 Nina, a similar oscillation in the Atlantic related to
3 tides and large scale circulation. There is also a
4 19-year cycle of the sun and the moon and all these
5 things come together.

6 So for a short period, and you can be
7 shown with historical sea level data that for short
8 periods you can find very anomalous results that don't
9 match the long return trends.

10 COMMISSIONER BARAN: So their view -- I
11 should wrap this up, I think. So their view is that
12 basically it's actually, you're going to get better
13 projections going all the way from 1900 to present
14 than to take the most recent period where you saw an
15 increase in the rate of sea level rise?

16 MS. SMITH: It may or may not be better,
17 but it's more consistent. It's difficult to discern
18 a real trend with a very short time period and very
19 short, 20 years is very short in this context.

20 COMMISSIONER BARAN: All right. Thank you
21 very much.

22 CHAIRMAN SVINICKI: All right. Well I
23 thank the panelists again for this, our Safety Panel.
24 We will now break for lunch and we will reconvene at
25 1:30 p.m. So we are adjourned until 1:30 p.m. Thank

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1 you.

2 (Whereupon, the above-entitled matter went
3 off the record at 11:54 a.m. and resumed at 1:33 p.m.)

4 CHAIRMAN SVINICKI: Well, good afternoon,
5 everyone. I call the hearing to order once again. So
6 now we will hear from the environmental panel.

7 The parties will address the environmental
8 review performed in connection with the combined
9 license application, including relevant sections of
10 the final environmental impact statement related to
11 the following novel issues: cooling water sources,
12 alternative sites, critical habitat, and consultations
13 with the U.S. Fish and Wildlife Service and the
14 National Marine Fisheries Service under the auspices
15 of the Endangered Species Act.

16 I remind all of the witnesses that they
17 remain under oath, and that the Commission is familiar
18 with their prehearing filings. I would ask the
19 panelists to please introduce themselves, and again,
20 for this combined panel, we will begin with the FPL
21 witnesses, so please introduce yourselves and then
22 proceed with your portion of the environmental panel
23 presentations.

24 MR. MAHER: Good afternoon, Commissioners.
25 My name is Bill Maher with Florida Power and Light.

1 MR. JACOBS: Paul Jacobs, Florida Power
2 and Light -

3 MR. ORTHEN: Richard Orthen.

4 (Simultaneous speaking)

5 MR. JACOBS: - engineer.

6 MR. ORTHEN: Richard Orthen, Florida Power
7 and Light, licensing engineer.

8 MR. MAHER: We'll start with the
9 presentation, slide two, please. As Mr. Franzone has
10 mentioned earlier, Florida Power and Light has over 50
11 years of environmental stewardship coupled with power
12 generation at the Turkey Point site.

13 Turkey Point 6 and 7 utilizes an existing
14 industrial facility next to an existing nuclear power
15 plant using approximately 80 percent of the existing
16 transmission corridors for a new nuclear power plant.

17 The construction roadway network that we
18 are building in order to provide construction worker
19 access to the site is being proposed to be removed
20 after construction is completed in order to preserve
21 the environment around the Turkey Point site.

22 In addition, as you have heard previously,
23 Turkey Point is creating water reuse opportunity for
24 both Miami-Dade county and for - with minimizing the
25 environmental impact associated with that. So what

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1 I'd like to do is turn it over to Mr. Paul Jacobs, and
2 he'll continue with the presentation.

3 MR. JACOBS: Thank you. Good afternoon.
4 During the early phase of the planning for Turkey
5 Points Units 6 and 7, FP&L performed a detailed study
6 to determine the optimal method of supplying cooling
7 water makeup to the units.

8 A total of 14 potential water sources were
9 identified. The study concluded that reclaimed water
10 was the best alternative that was technically
11 feasible, could be permitted, and was environmentally
12 preferable. Slide three, please?

13 Miami-Dade and FPL worked together to
14 develop a joint participation agreement for supplying
15 reclaimed water to Units 6 and 7. Under this plan,
16 Miami-Dade's South District Wastewater Treatment Plant
17 would provide up to 90 million gallons a day to FPL
18 for plant cooling water, makeup, and other plant uses.

19 The use of reclaimed water is beneficial
20 to the county to help it meet its reuse requirement,
21 and for FPL to have an adequate and reliable water
22 supply with no impacts to surface water.

23 FPL will also construct a reclaimed water
24 treatment facility on site to further treat the
25 reclaimed water to optimize the water quality for

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1 efficient plant operation. The figure displays the
2 nine-mile route the reclaimed water pipeline will take
3 from the South District Treatment Plant to the Turkey
4 Point site. Slide four, please?

5 This figure is a schematic of a typical
6 radial collector well installation. The radial
7 collector well supply system will be available to the
8 plant in the event that reclaimed water from the South
9 District Plant is not available in sufficient quantity
10 and quality.

11 As was pictured in the overview portion of
12 the presentation, the radial collector well system
13 caisson and pumping system will be located on the
14 Turkey Point peninsula in an upland area and can be
15 constructed without disturbance to Biscayne Bay.

16 Pictured on the left is a concrete caisson
17 approximately 50 feet in diameter and 50 feet in
18 depth. The figure shows one lateral, but each of the
19 four installed caissons will have a number of laterals
20 that extend radially outward under the bay.

21 The laterals shown as extending from the
22 caisson will be drilled at a depth of between 30 and
23 45 feet below the bay bottom where construction will
24 not cause disturbance to the bay.

25 I'd like to turn this over to Mr. Orthen

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1 who will now discuss the FPL augmented site selection
2 process.

3 MR. ORTHEN: Yes, thank you, Paul. Slide
4 five, please? Good afternoon. In our process for
5 considering alternative sites, we used the NRC's
6 environmental standard review and regulatory guidance,
7 as well as the EPRI siting guide.

8 Our region of interest in this process was
9 a geographic area we looked in to find potential and
10 candidate sites for the project, that is the FPL
11 service territory and areas closely adjacent to it.

12 This region was studied, or as I say,
13 screened, using exclusionary avoidance criteria to
14 eliminate areas that were unsuitable or significantly
15 less suitable than other potential siting areas.
16 Using this screening process, we found 16 candidate
17 areas that we could use to identify potential sites to
18 host the project.

19 FPL was able to identify 21 potential
20 sites for the reactors in these candidate areas using
21 mostly our corporate knowledge of the areas as well as
22 a more detailed canvassing effort to pinpoint
23 potential greenfield potential sites. This is why we
24 call it an augmented analysis.

25 Carrying this selection process through to

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1 the next step, we looked at the slate of 21 potential
2 sites, screened each one to identify primary sites,
3 and from that group, found the most suitable candidate
4 sites. Slide six, please?

5 From the 21 potential sites, we found
6 eight primary sites in the first screening cut, and
7 five of those eight sites made it through to the
8 second group as our group of final candidate sites.

9 We based our second cut screening on
10 fundamental site suitability criteria such as required
11 infrastructure, including transportation, railroad,
12 road, and barge access, as well as any civil work
13 necessary for site development.

14 Next, we went onto the final step in the
15 selection process, comparing each of the five
16 candidate sites on various issues and attributes, as
17 well as factoring in the cost and environmental
18 tradeoffs needed to develop each site.

19 At last, we arrived at the point where we
20 could rank those candidate sites. Based on this
21 ranking, we concluded there were no sites that were
22 environmentally preferable to our proposed site down
23 at Turkey Point. Slide seven, please?

24 Now I will to turn to talk about the
25 Turkey Point site critical habitat for the American

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1 crocodile, most notably the important work FPL carries
2 out to improve wildlife sustainability there.

3 Crocodiles were first observed at the
4 Turkey Point site in 1976, with active nesting
5 observed two years later. At the time, the crocodiles
6 had a very small population, but they have thrived in
7 the cooling canals in the Turkey Point industrial
8 wastewater facility.

9 The cooling canals are vital to the
10 crocodiles' success because they contain an extensive
11 system of canals and berms, and they support a variety
12 of wildlife that are tolerant of the subtropical
13 salient environment found there.

14 Critical habitat for the American
15 crocodile has been established in south Florida and a
16 small portion, less than one percent, exists at Turkey
17 Point, mostly in the cooling canals, but also
18 including the 218 acres of partially disturbed mud
19 flats that is the site for Units 6 and 7.

20 FPL proudly manages these areas through
21 its crocodile management program that features habitat
22 enhancement on the banks of the cooling canals to
23 improve the opportunities for nesting, active
24 management of water to improve quality, and foraging
25 opportunities, and monitoring reproductive success.

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1 These habitat management efforts, as well
2 as other efforts in the larger critical habitat beyond
3 Turkey Point, have been so effective that in 2007, the
4 U.S. Fish and Wildlife Service was able to down list
5 the crocodile species from federally endangered to
6 threatened.

7 Now, regarding our consultation with the
8 agencies, FPL began informal consultation with them in
9 September 2007 when we formed our compatibility
10 working group which included federal, state, and local
11 regulatory agencies that we invited to offer their
12 views on the ways the project could complement or
13 enhance their goals and objectives for the areas
14 affected by the project.

15 The Fish and Wildlife Service was an
16 active participant in this process which met eight
17 times between 2007 and 2009. FPL continued this
18 collaboration by working closely with Fish and
19 Wildlife Service staff throughout the project to
20 examine potential impacts to listed species, methods
21 for avoiding impacts, conservation measures to reduce
22 impacts, and unavoidable impacts mitigation.

23 In its 2017 biological opinion of the
24 project, the U.S. Fish and Wildlife Service concluded
25 that disturbance from the project due to activities at

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1 the Units 6 and 7 sites may affect, but would not
2 adversely affect the six ESA listed species. Please
3 note the slide seven count should read six, not five.
4 They further determined that the level anticipated
5 take of these species would not likely jeopardize
6 them.

7 The service described the crocodile
8 habitat within the proposed Units 6 and 7 site as
9 relatively poor quality. This can be attributed
10 mainly to the fact that this area is dry during
11 certain times of the year. Moreover, vegetation and
12 aquatic prey species for the crocodile do not occur
13 there, and observations by FPL indicate that it's not
14 a place the crocs like to be in for any length of
15 time.

16 Slide eight, please? With this view of
17 our project setting, that will end my presentation.
18 Thank you.

19 CHAIRMAN SVINICKI: I thank the applicant
20 panelists for that presentation. I would now as the
21 NRC staff panelists to please come and sit behind your
22 name tents, and please introduce yourself and then
23 proceed with the staff's presentations. Thank you.

24 MS. WILLIAMSON: Good afternoon. My name
25 is Alicia Williamson and I'm the environmental project

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1 manager for this project.

2 MR. HAQUE: Good afternoon. I'm Mohammed
3 Haque, senior hydrologist with the NRO.

4 MR. KUGLER: My name is Andrew Kugler and
5 I'm a senior project manager in the Office of New
6 Reactors.

7 MR. DOUB: Good afternoon. I'm Peyton
8 Doub, ecologist and wetland scientist with the Office
9 of New Reactors.

10 MS. WILLIAMSON: Hello, my name is Alicia
11 Williamson, and I'm the environmental project manager
12 for the Turkey Point Units 6 and 7 environmental
13 review. Today, the staff will be presenting
14 information on three environmental topics. The first
15 will be by NRC hydrologist, Mr. Mohammad Haque, who
16 will talk about the proposed cooling water sources.

17 Next, we will have Mr. Andrew Kugler, NRC
18 senior project manager, speak about the alternative
19 sites review. Finally, we will close the
20 environmental staff presentations with NRC ecologist,
21 Mr. J. Peyton Doub, who will present the staff's
22 findings regarding critical habitat for the threatened
23 American crocodile and the Endangered Species Act
24 consultation. Next slide, please?

25 MR. HAQUE: Thanks, Alicia. My name is

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1 Mohammad Haque. I'm a senior hydrologist in the
2 Office of New Reactors. I will be presenting
3 information on the cooling water sources for the
4 proposed Turkey Point Units 6 and 7.

5 The primary source of cooling water for
6 the circulating water system will be reclaimed water,
7 which is unique because only one other nuclear plant
8 in the United States, the Palo Verde Nuclear
9 Generating Station, uses reclaimed water for cooling.

10 The reclaimed water will be obtained from
11 the Miami-Dade water and sewer department's South
12 District Wastewater Treatment Plant, hereafter called
13 the South District Plant.

14 Additionally, FPL includes in the design
15 a backup water source for added power generation
16 reliability in case the reclaimed water cannot meet
17 the plant's needs for a period. The addition of this
18 backup water source is unique to the proposed Turkey
19 Point Units 6 and 7 because no other U.S. nuclear
20 plant has a backup water source.

21 The proposed backup source of cooling
22 water for the circulating water system for Turkey
23 Point Units 6 and 7 would be saltwater obtained from
24 beneath Biscayne Bay through four radial collector
25 wells. The pumping period and amount of water

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1 withdrawn from the wells would be limited by the
2 Florida Department of Environmental Protection's
3 Conditions of Certification to 60 days or less per
4 year.

5 The circulating water system would be
6 designed to utilize 100 percent of its required water
7 supply from reclaimed water, saltwater, or a
8 combination of the two sources. Next slide, please?

9 This slide presents a simplified
10 illustration of the two proposed cooling water sources
11 for the proposed Turkey Point Units 6 and 7 and
12 disposal of the plant's effluent water. About 73
13 million gallons per day of reclaimed water would be
14 obtained from the South District Plant located about
15 nine miles north of the Turkey Point site.

16 The water would be piped to FPL's
17 reclaimed water treatment facility for further
18 treatment. The treated reclaimed water would be
19 stored in a makeup water reservoir from which water
20 would be withdrawn as needed to provide cooling water
21 to the cooling tower basins for each unit.

22 The backup source of cooling water is
23 saltwater extracted from beneath Biscayne Bay to four
24 radial collector wells. Each radial collector well
25 would contain several lateral collector lines at

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1 depths of 25 to 40 feet beneath the bay floor,
2 extending out horizontally up to 900 feet. When used,
3 the saltwater from radial wells would be pumped
4 directly to the cooling tower basins as needed to
5 provide cooling water.

6 The disposal of the effluent would be done
7 by injection into the border zone of the lower Florida
8 aquifer under the Florida Department of Environmental
9 Protection's underground injection control program.
10 The border zone is a deep-set aquifer over 3,000 feet
11 below the surface at the site.

12 Water within the border zone is kept
13 separate from the overlying brackish upper Florida
14 aquifer by around 1,500 feet of low permeability zone.
15 The low permeability zone is referred to as the middle
16 confining unit of the Florida aquifer system. Next
17 slide, please?

18 This slide shows a planned view of a
19 typical radial collector well system as presented in
20 figure 3-5 of the EIS. As shown in this diagram, each
21 radial collector well would have several lateral
22 collector lines extending horizontally beneath the
23 Biscayne Bay. Next slide, please?

24 In the EIS, the review team's evaluation
25 considered how surface water and groundwater resources

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1 would be affected during the construction and
2 operation of Turkey Point Units 6 and 7. The staff
3 concluded that the impacts to surface and groundwater
4 use and quality would be small during construction and
5 operation. Because no surface water or groundwater is
6 being withdrawn to be used as the primary water source
7 for cooling, there is no impact on surface water or
8 groundwater users.

9 The staff also concluded that impacts to
10 surface and groundwater use and quality would be small
11 during construction and operation when the backup
12 source saltwater from the radial collector wells is
13 used. This conclusion, as discussed in detail in the
14 EIS, was based on part on the limited use of the
15 radial wells.

16 The conclusion was also based on the
17 understanding that only a small portion of water would
18 come from the Biscayne aquifer, which staff determined
19 based on effects on certain hydrological features as
20 projected by FPL's modeling effort, a NRC-sponsored
21 USGS modeling study, and an additional modeling
22 analysis confirming the review team's understanding.

23 A detailed description of this analysis,
24 including the modeling efforts, is provided in the EIS
25 in sections 2.3, 4.2, 5.2, and appendix G.2.3. This

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1 concludes my remarks. I will now turn the
2 presentation over to Mr. Andy Kugler.

3 MR. KUGLER: Thank you, Mohammed. The
4 consideration of alternative sites is a fundamental
5 part of the staff's review of a new reactor
6 application.

7 When it compares sites, the staff
8 typically uses the same type of cooling water source,
9 such as surface water, at the proposed and alternative
10 sites to avoid a potential bias in the comparison.
11 This is consistent with the guidance in the
12 Environmental Standard Review Plan.

13 However, the guidance allows for the use
14 of a different type of cooling water source at the
15 alternative sites if the type of source used at the
16 proposed site cannot be used. That is the case for
17 the Turkey Point combined license application.

18 None of the alternative sites would have
19 had access to an adequate source of reclaimed water,
20 and the staff did not identify other viable sites that
21 could have access to enough reclaimed water.
22 Therefore, the alternative sites would have to get
23 water from some other source. Next slide, please?

24 The location of the alternative sites and
25 the proposed sites are shown on this slide. The St.

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1 Lucie alternative site is on the east coast while the
2 other three alternative sites are clustered around
3 Lake Okeechobee and its associated rivers. Next
4 slide, please?

5 For the St. Lucie alternative site, water
6 would come from the Atlantic Ocean through the
7 existing intake for the currently operating units at
8 that site. The situation for the three inland
9 alternative sites, Glades, Okeechobee, and Martin, is
10 more complex because surface water in that region is
11 tightly managed.

12 FPL had initially proposed the use of
13 surface water to cool the plant at these sites, but
14 based on discussions with the South Florida Water
15 Management District, it became clear that obtaining
16 sufficient surface water to cool the plants was
17 unlikely.

18 Therefore, FPL modified its approach
19 proposing to use a combination of surface water and
20 groundwater at these alternative sites. FPL proposed
21 to use excess surface water whenever it was available
22 and to store excess surface water in a 3,000 acre
23 reservoir.

24 When no excess surface water was available
25 and the water in the reservoir had been consumed, the

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1 plant would use groundwater pumped from a deep saline
2 aquifer.

3 FPL also proposed the use of a
4 desalination plant to reduce the salt content of water
5 being pumped out of the aquifer. This step was
6 proposed to protect nearby vegetation from drift from
7 the cooling towers. Drift refers to water droplets
8 carried out of the cooling tower with the water vapor.
9 Drift carries with it particulates such as salts.
10 Next slide, please?

11 Because the applicants' proposed approach
12 for the three inland sites was unusual, the staff
13 considered whether a further modification of this
14 approach would lead to reduced environmental impacts.
15 First, the staff looked at whether impacts could be
16 reduced by eliminating the reservoir and relying on
17 groundwater whenever excess surface water was not
18 available.

19 In addition, it was not clear that the
20 desalination plant was warranted to protect nearby
21 vegetation because the amount of drift escaping from
22 a modern cooling tower and reaching nearby vegetation
23 is already small. As such, the staff did not include
24 a desalination plant in its evaluation.

25 Therefore, the staff's evaluation of the

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1 impacts of the inland alternative sites was based on
2 cooling the plant with excess surface water whenever
3 it was available and using saline groundwater at other
4 times. Next slide, please?

5 Using the approach that it had developed,
6 the staff compared the impacts of building and
7 operating the nuclear units at the alternative sites
8 to those at the proposed site. Based on predicted
9 environmental impacts at the proposed site and the
10 alternative sites, the staff concluded that none of
11 the alternative sites was environmentally preferable
12 to the proposed site.

13 In addition, in the EIS, the staff
14 acknowledged there was uncertainty regarding how the
15 cooling water system at the inland sites could be
16 implemented. No user has ever requested a permit to
17 use water in these quantities from the deep aquifer
18 FPL proposed to use. This would be a first of a kind
19 application.

20 Because of this uncertainty, the staff
21 qualitatively evaluated how the impacts would be
22 different if the 3,000 acre reservoir was included.
23 Including the reservoir would increase the impacts on
24 terrestrial ecology and land use, and in a minor way,
25 would also increase the impacts on aquatic ecology and

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1 surface water use. Impacts on other resources would
2 likely not change appreciably.

3 This concludes my remarks. I will now
4 turn the presentation over to Mr. Peyton Doub.

5 MR. DOUB: Thank you, Andy. Accessing the
6 potential -

7 PARTICIPANT: I think your mic is off.

8 MR. DOUB: Accessing the potential for
9 effects to threatened and endangered species and their
10 habitats is a key component of the staff's
11 environmental review of a new reactor application.
12 Under the Endangered Species Act, habitats may be
13 designated as critical, meaning they are essential to
14 support species protected under the act.

15 The designation of critical habitat does
16 not necessarily restrict development, but does require
17 proponents of development in designated areas to
18 examine the protection of important characteristics of
19 the habitat.

20 The Turkey Point application is novel
21 since it proposes to build new reactors in an area
22 designated as critical habitat, in this case for the
23 threatened American crocodile. No other COL
24 application to date has involved building new
25 facilities in areas designated under the Endangered

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1 Species Act as critical habitat.

2 On June 23, 2017, the U.S. Fish and
3 Wildlife Service issued a biological opinion that
4 among other considerations concurred with the staff's
5 conclusions that construction and operation will not
6 adversely affect designated critical habitat for the
7 American crocodile. Next slide, please?

8 The entire proposed Turkey Point Units 6
9 and 7 plant area and most of the nearby industrial
10 waste facility are situated within designated critical
11 habitat for the American crocodile. Potential impacts
12 to critical habitat include the permanent loss of
13 approximately 270 acres to accommodate the proposed
14 new reactors and associated infrastructure.

15 Additionally, approximately 211 acres of
16 additional critical habitat would be affected by
17 relocation of the soils and other solid material to
18 three disposal areas on upland berms of the industrial
19 waste facility.

20 The review team's analysis concluded that
21 the affected area constitutes only about 0.09 percent
22 of the total terrestrial crocodile critical habitat
23 available were only about 270 out of 293,000 acres in
24 south Florida as depicted on this map.

25 Past monitoring and nesting surveys

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1 conducted by FPL suggests that the proposed plant area
2 in the northeast portion of the industrial waste
3 facility is generally considered to be low quality
4 crocodile habitat that is not actively used by
5 crocodiles.

6 The applicants specifically selected the
7 three proposed muck storage areas in the industrial
8 waste facility because of their lack of suitable
9 nesting substrate for crocodiles and because they
10 represent only a very small percentage of berm habitat
11 available for crocodiles in the industrial waste
12 facility.

13 Higher quality foraging and nesting
14 habitat occur south and west of the affected areas.
15 The Fish and Wildlife Service considers nesting and
16 foraging qualities to be important features for
17 critical crocodile habitat.

18 Because the designated critical habitat in
19 the power block and muck storage areas is considered
20 to be poor quality for nesting and foraging for the
21 crocodile, the Service in their biological opinion
22 agreed with the staff's conclusions that although
23 there may be adverse effects to the American
24 crocodile, there would be an overall minimal impact to
25 the species. Next slide, please?

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1 The applicant already implements ongoing
2 active crocodile monitoring and work restrictions on
3 the site as part of compliance with an existing
4 biological opinion for Turkey Point Units 3 and 4.
5 These measures include speed limits and other
6 protective measures related to vehicular incidents,
7 habitat management, nesting surveys, and crocodile
8 relocation.

9 These existing measures would be
10 complemented by additional measures established as
11 terms and conditions in the new biological opinion
12 specifically issued by the Fish and Wildlife Service
13 for Units 6 and 7.

14 As stated in the biological opinion, FPL
15 would implement several protective measures for the
16 crocodile including education of construction workers
17 regarding crocodile habitats, behaviors, and reporting
18 any contact with nests or individuals, installation of
19 exclusion fencing to prevent migration to the power
20 block area from the northern portion of the industrial
21 waste facility, and daily pedestrian surveys
22 immediately prior to and during land clearing and fill
23 placement within the power block area, and during much
24 hauling along associated roadways. Other measures
25 outlined in the biological opinion such as enhancing

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1 other nearby wetland habitat may also indirectly
2 benefit the crocodile.

3 The Fish and Wildlife Service concluded
4 that the proposed project can be expected to result in
5 the incidental take of crocodiles in the form of harm
6 from habitat loss and possible injuries or mortalities
7 from vehicle collisions.

8 Based on the increase in road traffic
9 during construction and the use of fencing to minimize
10 risk to crocodiles at road crossings, the Service
11 estimated incidental injury and mortality along roads
12 to be one crocodile every five years or a total of two
13 crocodiles over the duration of the estimated ten-year
14 construction phase. During operation, the Service
15 estimated injury and mortality along the roadways to
16 be one crocodile every ten years over the operational
17 life of the project.

18 Therefore, although Turkey Point Units 6
19 and 7 would be constructed on designated critical
20 habitat, the Fish and Wildlife Service confirmed that
21 the construction and operation of the new units would
22 not jeopardize the survival of the American crocodile
23 population, nor would the project result in adverse
24 modification of designated critical habitat to the
25 extent that it detrimentally affects the overall

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1 crocodile population. Next slide, please?

2 The American crocodile is but one of
3 several threatened or endangered species that the
4 staff considered in its environmental review for
5 Turkey Point Units 6 and 7.

6 The staff prepared and submitted separate
7 biological assessments to the U.S. Fish and Wildlife
8 Service and the National Marine Fisheries Service
9 addressing potential effects of the project on
10 threatened and endangered mammals, birds, reptiles,
11 fish, insects, and plants knowing to occur or
12 potentially occur in the affected area.

13 The National Marine Fisheries Service
14 concurred with the staff that the project would have
15 no effect, or may affect, but was not likely to
16 adversely affect the marine and anadromous fish, sea
17 turtles, and marine mammals under its purview.

18 The Fish and Wildlife Service determined
19 in its biological opinion that the project may
20 adversely affect the American crocodile, eastern
21 indigo snake, everglade snail kite, Florida panther,
22 rufa red knot, and wood stork.

23 The Fish and Wildlife Service issued NRC
24 an incidental take statement establishing incidental
25 take limits for each of these six species measured in

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1 numbers of individuals affected and/or areas of
2 habitat disturbed. To comply with the terms and
3 conditions of the biological opinion, the applicant
4 must implement specific protective and conservation
5 measures.

6 The draft environmental protection plan
7 prepared by the staff incorporates many of these terms
8 and conditions, and the U.S. Army Corps of Engineers
9 has agreed to incorporate the remainder as conditions
10 to a future Department of the Army permit for the
11 project. Now I return you to Alicia Williamson.

12 MS. WILLIAMSON: Thank you, Peyton. The
13 staff thanks the Commission for this opportunity to
14 present and it's ready to take any questions. Thank
15 you.

16 CHAIRMAN SVINICKI: Thank you for those
17 presentations, and similar to the safety panel, I
18 would ask that given that you have the other witnesses
19 sitting behind you, if you would move slightly off to
20 the sides, that would be appreciated. Thank you. And
21 so for the questioning of this environmental panel, I
22 will lead off today.

23 So for the applicant, let me begin.
24 Regarding the reliance on the reclaimed water system
25 which has been described, I think, by both the

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1 applicant witnesses and the staff, I imagine that that
2 process required FPL to engage with local and state
3 regulatory agencies.

4 Could you please describe at a high level
5 the engagement that you had with these other
6 authorities regarding siting and construction of the
7 on-site treatment facility and the system that
8 connects the existing wastewater treatment plant with
9 those on-site facilities? And what are the principal
10 interest areas of those local and state authorities
11 with which you needed to engage?

12 MR. MAHER: Yes, Commissioner, this is
13 Bill Maher. We engaged with Miami-Dade County early
14 on in the project as you have heard, and we have come
15 up with a joint participation agreement which outlines
16 at a very high level the water attributes that we
17 would be looking for once we were to build Turkey
18 Point Units 6 and 7.

19 With respect to the location of the
20 reclaimed water treatment facility, as you heard, we
21 had relocated that as a result of some county
22 interactions in order to minimize environmental
23 impacts, so that illustrates some of the engagement
24 that we had with the county and city officials.

25 CHAIRMAN SVINICKI: Okay, thank you. And

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1 for the staff, typically I ask this type of question,
2 and I know that there's a description in the record of
3 the process that the staff used for identifying and
4 evaluating potential new and significant information
5 for the environmental analysis, but could one of the
6 NRC staff panelists just give a description of how you
7 went about doing that, of identifying and then
8 evaluating any potential new and significant
9 information given the long pendency of the staff's
10 review?

11 MS. WILLIAMSON: For this particular
12 application, we did utilize the staff's guidance. We
13 were on the lookout for new and significant
14 information. Although we did not formally initiate
15 that process, I think it calls for sending the
16 applicant a letter and telling them to keep us
17 apprised of information because of the -

18 We always thought that the hearing was
19 imminent or impending, so we never officially sent
20 that letter, but did keep apprised of that particular
21 process by talking with, a continuing dialogue with
22 our other federal partners and state partners
23 throughout the various times after the EIS was
24 published.

25 Additionally, there's a strong level of

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1 public interest for this particular project, so we did
2 receive some calls or emails from members of the
3 public as well, but mainly through our dialogue with
4 our various federal, state, and local partners.

5 CHAIRMAN SVINICKI: As a result of that
6 process, was there any information that met the
7 staff's threshold for being new and also significant,
8 and in any way modifying the staff's previous
9 environmental conclusions?

10 MS. WILLIAMSON: No, there was nothing
11 that met the new and significant criteria.

12 CHAIRMAN SVINICKI: Okay, thank you. With
13 that, I will recognize Commissioner Baran.

14 COMMISSIONER BARAN: Thanks. I'd like to
15 begin by asking about the site selection process that
16 led to selecting the Turkey Point site as the location
17 for the proposed units. I'll start with some
18 questions for FPL.

19 If I understand it from the final EIS and
20 from your presentation on this panel, the site
21 selection process identified 21 potential sites. FPL
22 then applied the screening criteria and identified the
23 top eight ranked sites which did not include Turkey
24 Point.

25 However, because it was an existing

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1 nuclear power plant site, Turkey Point was included on
2 an expanded list of ten potential sites that remained
3 in consideration along with the St. Lucie site. Is
4 that right?

5 MR. ORTHEN: That's correct.

6 COMMISSIONER BARAN: And when these ten
7 remaining sites entered the next phase of the
8 selection process, FPL used 34 weighted criteria to
9 evaluate them, and based on that evaluation, Turkey
10 Point emerged as the number one preferred site. Is
11 that right?

12 MR. ORTHEN: That was part of the import
13 of that process, yes, but it was ranked highest in the
14 technical evaluation and it graded more favorably in
15 eight of ten, 12 considerations of risk and strategic
16 measures.

17 COMMISSIONER BARAN: Okay, and I see on
18 your slide five, it walked through this -

19 MR. ORTHEN: Right.

20 COMMISSIONER BARAN: - a little bit on
21 slide six. Can you walk us through how did Turkey
22 Point end up finishing first in the second phase after
23 failing to make the top eight in the first phase?
24 What was driving that outcome?

25 MR. ORTHEN: I'd like to ask Kyle Turner

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1 if he could please speak to that.

2 MR. TURNER: Sure.

3 CHAIRMAN SVINICKI: And as you approach
4 the podium, if you could please again identify
5 yourself, your title or organizational affiliation,
6 and confirm that you've been sworn as a witness?

7 MR. TURNER: My name is Kyle Turner. I'm
8 a principal with McCallum-Turner, Incorporated. We
9 were a contractor to FPL, and I have not been sworn
10 in.

11 CHAIRMAN SVINICKI: Oh, okay, well, then
12 I will ask our general counsel here to, okay. You
13 have identified yourself, so I would ask that you
14 raise your right hand and I will read the oath. Do
15 you swear or affirm that the testimony you will
16 provide in this proceeding is the truth, the whole
17 truth, and nothing but the truth?

18 MR. TURNER: I do.

19 CHAIRMAN SVINICKI: Thank you very much.
20 And if there is no objection to this witness, I will
21 let you proceed to provide a response.

22 MR. TURNER: To expand a little bit on the
23 process, the first down select, I'll call it, from 21
24 sites to ten was made on the basis of what we call
25 screening criteria. They're derived from those in the

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1 EPRI siting guide, and they're very generalized.

2 They're intended to give us a very quick
3 and dirty picture of the relative suitability of all
4 of the sites then under consideration. The purpose of
5 that is to arrive at a smaller number of sites that we
6 can then spend a larger set of resources in examining
7 in more detail.

8 Those criteria are - the set of criteria
9 that we call screening criteria are typically
10 organized and crafted in order to examine greenfield
11 sites. They don't really have in them anything that
12 allows you to reflect the goodness or badness of an
13 existing site.

14 So the fact that in the second phase where
15 we used a much more detailed set of 34 criteria, that
16 Turkey Point rose much higher in the ranking, is
17 neither really should be surprising, nor is it unique.
18 There have been other site selection studies we've
19 done where a similar thing happened in regards to an
20 existing plant site.

21 COMMISSIONER BARAN: And were there - when
22 I look at the slide six and it has the scores there of
23 the ten and Turkey Point is the highest by a fair bit,
24 were there any particular factors you could point to
25 there as driving the relative high score of Turkey

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1 Point?

2 MR. TURNER: Well, I can answer that very
3 generally, but those scores are very much a composite
4 of a weighting and rating scheme, and it's very
5 difficult to draw out of that a central theme.

6 COMMISSIONER BARAN: Okay.

7 MR. TURNER: Because Turkey Point, as
8 other sites, would rate better or worse than others
9 depending on what criterion one might be examining, so
10 the result there truly is a composite one, and the
11 aggregate Turkey Point came out better for multiple
12 reasons.

13 If I had to, off the cuff now, give you a
14 suspicion of what probably drove that, it would be
15 that it's an existing site. It had very good ratings
16 in regards to new disturbance, in regards to proximity
17 to existing infrastructure and those kinds of things.

18 COMMISSIONER BARAN: Okay, thanks. That's
19 helpful. Let me ask the NRC staff. In response to
20 prehearing questions, the staff acknowledged that the
21 Turkey Point site was handled differently than the
22 alternative sites, but stated that NRC guidance
23 provides for this because it's an existing nuclear
24 power plant site.

25 Is the guidance in the standard review

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1 plan how the Turkey Point site made it through the
2 first round of the site selection process? Does it
3 automatically get through the first round because it's
4 an existing power plant site?

5 MR. KUGLER: I believe the way the
6 applicant wrote their environment report, that they
7 did include both Turkey Point and St. Lucie as
8 existing sites because of the exception that's
9 discussed in the environmental standard review plan
10 for an existing site.

11 COMMISSIONER BARAN: So that's what gets
12 them through phase one?

13 MR. KUGLER: Yes, it would get them
14 through phase one essentially regardless of their
15 rating. Really that exception is intended by the
16 staff to just be for the proposed site. In other
17 words, the way the process is set up, an applicant can
18 just choose a site.

19 Just pick it, put it aside, then go
20 through a process to identify and evaluate alternative
21 sites, come down a group of alternatives, and then
22 compare each alternative site to the proposed site and
23 determine if they are environmentally preferable.

24 It wasn't really intended to necessarily
25 include all nuclear sites within the region. That was

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1 the approach that FPL took. It did not harm the
2 process because they still had a good set of
3 alternative sites for us to do the comparison.

4 COMMISSIONER BARAN: The site selection
5 guidance establishes exclusionary criteria to be
6 applied at the beginning of the site selection
7 process. To be a candidate site, a site has to meet
8 these minimum criteria. If a site can't meet all of
9 the criteria, that would preclude siting a nuclear
10 power plant at that location.

11 Some of the exclusionary criteria relate
12 to national parks, critical habitat for endangered or
13 threatened species, and population density. Was the
14 Turkey Point site required to meet the exclusionary
15 criteria?

16 MR. KUGLER: It would not be because it
17 was chosen through the exception. So basically you
18 take and you set it aside so it doesn't go through
19 that process.

20 COMMISSIONER BARAN: Okay, so that's part
21 of that phase one it moves past -

22 MR. KUGLER: Correct.

23 COMMISSIONER BARAN: - because it's an
24 existing site?

25 MR. KUGLER: Correct.

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1 COMMISSIONER BARAN: If Turkey Point
2 wasn't an existing nuclear power plant site and the
3 exclusionary criteria were applied to the site, would
4 the exclusionary criteria have been met?

5 MR. KUGLER: Well, this is a hypothetical,
6 but I don't believe it would have based on the
7 critical habitat at least because there is critical
8 habitat on the site. Population density, I'm not sure
9 if it would have. It is over 500 at this point, so I
10 think it -

11 COMMISSIONER BARAN: I think the
12 exclusionary criteria actually had the population
13 density cut off at 300 -

14 MR. KUGLER: 300?

15 COMMISSIONER BARAN: - per square mile
16 with a 20-mile radius, and the actual amount was 656.
17 I don't know if FPL wants to chime in on this. If
18 Turkey Point wasn't an existing nuclear power plant
19 site and the exclusionary criteria were applied to the
20 site, would the criteria have been met?

21 MR. ORTHEN: I would have to take that
22 back and think about it at this point. I really have
23 not considered that fully.

24 COMMISSIONER BARAN: For anything that
25 wasn't an existing site, if you exceeded - if you did

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1 have portions of the site that lied within mapped
2 American crocodile critical habitat or you exceeded
3 the population density by a factor of two, would that
4 have eliminated such a site from consideration for a
5 nonexisting power plant site?

6 MR. KUGLER: Well, again, this portion of
7 the process is actually run by the applicant. It
8 would probably make more sense if they responded to
9 that portion.

10 COMMISSIONER BARAN: I have a thought on
11 that.

12 MR. ORTHEN: Could you repeat that?

13 COMMISSIONER BARAN: Well, what I'm trying
14 to understand is in part if we were talking about a
15 site that was not an existing power plant site, and it
16 lied within mapped critical habitat, and it more than
17 doubled the population density cutoff, that 20-mile
18 radius, would any site that wasn't an existing power
19 plant site, would they have been excluded, eliminated
20 based on those criteria?

21 MR. ORTHEN: It would be a possibility,
22 yes, but again, I'd have to defer to Kyle for that.

23 MR. MAHER: Yes, this is Bill Maher. So
24 if you look at - if Turkey Point was not a nuclear
25 site, if you look at siting a power plant down there,

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1 Florida, as you know, is a peninsula, and the majority
2 of the population zones at least are situated around
3 the coast.

4 On the inland sites, as Mr. Kugler has
5 already informed you, there are water restrictions,
6 both ground and surface water restrictions, also
7 inland sites are mostly agricultural in nature.
8 Within Florida, as we wrote for our purpose and need
9 on this particular project, it was to serve baseline
10 - or provide base load generation for the Miami load
11 center.

12 And if you look at where Turkey Point is
13 in relation to that Miami load center, it provides a
14 balance around that load center. So if it was not a
15 nuclear power site, you would have to go through that
16 weighting criteria that Kyle had talked about
17 previously to see, given those changed circumstances,
18 if you would still be able to provide a balanced load
19 around that load center for a new plant.

20 COMMISSIONER BARAN: Okay, the National
21 Park Service was a cooperating agency on the Turkey
22 Point final EIS. The Park Service is involved because
23 the Turkey Point site is immediately adjacent to
24 Biscayne National Park, and Everglades National Park
25 is located seven miles to the west of the facility.

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1 In a December 2016 letter to NRC, the Park
2 Service stated, "NPS continues to have serious
3 concerns regarding the adequacy and accuracy of the
4 final EIS." The Park Service expressed its view that,
5 "This project poses serious direct and cumulative
6 impacts to National Park Service resources."

7 NPS went on to say, "It does not seem to
8 be in the public interest to expand a power plant
9 adjacent to Biscayne National Park and near Everglades
10 National Park." Did the staff evaluate these
11 concerns, and if so, what did you conclude?

12 MS. WILLIAMSON: This is Alicia
13 Williamson. Yes, we did evaluate the Park Service's
14 concerns. As it was talked in one of the earlier
15 panels, they were a cooperating agency on the EIS, so
16 they did have - they worked with us as partners as we
17 built the EIS.

18 I think that some of the, I guess I'll say
19 differences of opinion, and why they may still have
20 concerns stems from our various - they're more of a
21 conservation agency while we are a regulatory agency.

22 In terms of examples of some of the things
23 that we did do, specifically as a result of their
24 comments on the DEIS, we actually went back and
25 conducted an additional water modeling analysis as a

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1 result of their concerns that came out of their DEIS
2 comments.

3 Additionally, we also had many meetings
4 with them, in person as well as on telecom, sometimes
5 weekly, sometimes biweekly just depending on what
6 phase of the review we were in, to discuss their
7 concerns, but they were intimately involved with the
8 production of the EIS.

9 COMMISSIONER BARAN: On an earlier panel,
10 the staff referred to the National Park Service as
11 having special expertise in this area. Isn't the
12 National Park Service best positioned to assess the
13 impacts on Biscayne National Park and Everglades
14 National Park?

15 MS. WILLIAMSON: Yes, they did provide us
16 input. They do have a direct knowledge that we were
17 able to draw upon and use within our analysis within
18 the EIS.

19 COMMISSIONER BARAN: And were they
20 ultimately satisfied with the EIS analysis?

21 MS. WILLIAMSON: According to their
22 December letter, they did still express concerns.

23 COMMISSIONER BARAN: Okay, so there wasn't
24 anything after that in which they came back and said
25 they were satisfied?

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1 MS. WILLIAMSON: No.

2 COMMISSIONER BARAN: Okay, and then in
3 another December 2016 comment to letter to the NRC,
4 the EPA stated that it also, "has several
5 environmental concerns that were not adequately
6 addressed in the final EIS."

7 EPA indicated that its overriding
8 environmental concerns stem from the fact that the
9 existing facility is currently impacting an
10 underground source of drinking water and that the
11 plant expansion could, "potentially complicate or
12 exacerbate existing environmental impact issues." Did
13 the staff evaluate those concerns, and if so, what did
14 you conclude?

15 MS. WILLIAMSON: Yes, the staff did also.
16 We also worked with the Environmental Protection
17 Agency Region IV in Atlanta. We met with them many
18 times also over the course of the review and took
19 their comments directly, particularly regarding the
20 USDW.

21 For more specifics, I might want to ask
22 one of the staff members from the audience to come and
23 give us a little bit more detail on those EPA comments
24 and some of the activities we conducted with EPA.

25 CHAIRMAN SVINICKI: And again, if you

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1 would state your name, your organizational
2 affiliation, and indicate whether or not you've been
3 sworn as a witness?

4 MR. BARNHURST: Sure, my name is Daniel
5 Barnhurst. I'm a hydrogeologist with NRO and I have
6 been sworn in.

7 CHAIRMAN SVINICKI: Thank you.

8 MR. BARNHURST: And so as Ms. Williamson
9 indicated, the concerns that were brought up from the
10 EPA related to potential impact to water resources.
11 Each of those concerns actually came to us in the form
12 of comments and in person as we met with them
13 throughout the process, and those are things that we
14 evaluated in the EIS and documented in section 5-2 and
15 7-2.

16 And then as Ms. Williamson also indicated,
17 there was additional modeling that was performed
18 between the DEIS and the FEIS stage, and if you look
19 at the FEIS, you can see change bars in the column
20 indicating new text that was added between the DEIS
21 and the FEIS. Much of that was added because of - in
22 order to be responsive to the National Park Service
23 and the EPA's concerns.

24 And so in the water section for instance,
25 she indicated there was additional modeling that was

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1 performed. That modeling was done to evaluate the
2 Units 3 and 4, the issues that were occurring at the
3 plant at that time with the hypersaline, the cooling
4 canal system, the hypersaline plume that was moving
5 into Biscayne from beneath the plant.

6 COMMISSIONER BARAN: Was EPA ultimately
7 satisfied with that modeling and the final EIS?

8 MR. BARNHURST: I think their comment
9 letter indicates that they still have concern. I do
10 feel, you know, from a technical aspect, that we did
11 fully evaluate that and we determined that the impact
12 from the existing plant, or, excuse me, the proposed
13 plants, 6 and 7, the impact that would occur, the
14 nexus there between Units 6 and 7 and the site would
15 be mainly the operation of radial collector wells
16 which, again, would be limited.

17 And so as we evaluated the entire site and
18 the changes in the baseline, that it occurred because
19 of the hypersaline plume and some of the other issues
20 there, mitigation measures that were proposed. As we
21 evaluated that in the new model, we determined that
22 those impacts would occur. They would be there
23 regardless of whether or not Units 6 and 7 were built
24 and that operation of the radial collector wells would
25 not impact the water resources there.

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1 COMMISSIONER BARAN: I'm kind of out of
2 time, but is it fair to say that in the end, the NRC
3 staff ultimately disagreed with the EPA and the
4 National Park Service on this?

5 MS. WILLIAMSON: I would say that it is a
6 difference of opinion, yes.

7 COMMISSIONER BARAN: Thank you.

8 CHAIRMAN SVINICKI: Thank you.
9 Commissioner Burns, please proceed.

10 COMMISSIONER BURNS: Yes, one question I
11 have, I think we've had, and I think Ms. Williamson
12 may have alluded to it, is the question about whether
13 we have looked or have identified any potential new
14 and significant information that might require
15 supplementation of the FEIS.

16 And I think in the response to question
17 58, staff indicated the only information considered
18 was new information regarding a draft settlement
19 between FP&L and the city of Miami that would lead to
20 underground siting or underground extension of
21 transmission lines.

22 We had a lot of discussion this morning
23 with respect to the recent hurricane information, and
24 I take it, and to some extent I am inferring from the
25 testimony we received this morning, but I also would

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1 like to hear from this panel and the environmental
2 experts whether or not you considered any of the
3 recent information from the aspects of the hurricanes
4 that were recently experienced as potentially new and
5 significant information in that area? Has the staff
6 taken that into consideration?

7 MS. WILLIAMSON: We did not specifically
8 take into account the recent series of hurricanes
9 within our new and significant process, although we
10 did examine and look at the potential of hurricanes as
11 part of the environmental impact assessment.

12 COMMISSIONER BURNS: Okay, the other -
13 another aspect I'd be interested in, in prehearing
14 question 47, the Commission asked about potential
15 license conditions discussed in a letter resulting
16 from the consultation with the National Marine
17 Fisheries Service.

18 In the response, it stated none of - the
19 staff said none of the three items noted in the
20 question would be addressed in the COLs if they were
21 granted, but they did not say other than - it did not
22 really explain why other than a note that the staff
23 expected the Department of the Army permits would
24 include these items. Is that how you would expect
25 that would come out?

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1 MR. DOUB: Yes, what we did with both the
2 concurrence letter from the National Marine Fisheries
3 Service and the incidental take statement from the
4 Fish and Wildlife Service, we looked at the various
5 requirements, identified each.

6 Some of them pertained to survey and
7 reporting actions, and those are being included in our
8 environmental protection plan which will actually be
9 part of the license conditions, and others pertained
10 to conservation measures that don't strictly fall
11 under NRC's regulatory authority.

12 For those, the U.S. Army Corps of
13 Engineers specifically agreed to include them as
14 conditions to their Department of the Army permit that
15 they will issue under the Clean Water Act.

16 COMMISSIONER BURNS: Is that because we
17 would consider them preconstruction activities?

18 MR. DOUB: No, it's more what we have
19 authority to enforce.

20 COMMISSIONER BURNS: Okay.

21 MR. DOUB: And if you need more details on
22 that, I might refer you to a lawyer.

23 COMMISSIONER BURNS: Not this one. I
24 don't want to argue with myself. Anyway, no, I
25 appreciate, all kidding aside, I appreciate that

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1 because I think what you note is that there is more
2 than one regulatory agency or oversight body involved
3 in the permitting of projects, you know, nuclear power
4 plants as well as many other projects, so this is
5 something where we've taken, as I understand your
6 answer, we look at this as something within the
7 purview of the Corps?

8 MR. KUGLER: Yes, sir.

9 COMMISSIONER BURNS: Okay, thank you.
10 Thank you, Chairman.

11 CHAIRMAN SVINICKI: All right, well, I'd
12 like to thank the panelists for the environmental
13 panels, and if you will take your seats, I would ask
14 the closing statement participants by the applicant
15 and the NRC staff to please come up and take places at
16 the table. We'll just take a brief moment here to
17 reset for that purpose.

18 So as the staff take their seats, I will
19 now offer each party the opportunity to make a closing
20 statement, and we will begin with the applicant, FPL.
21 Please proceed.

22 MR. MAHER: First, thank you,
23 Commissioners for the time and effort that you put
24 forth in preparing for and conducting this hearing.
25 We appreciate your insights and questions, and ensure

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1 that any follow-up information that you may want is
2 addressed.

3 I would also like to recognize the work
4 done by the NRC staff. I believe that this hearing
5 has fully demonstrated the exhaustive review done by
6 the staff and validates the staff's safety and
7 environmental findings with about 120,000 hours of
8 review by the NRC staff and contractors, or about 57
9 man-years worth of work.

10 We certainly agree with the conclusions
11 that the AP 1000 is safe, the environmental
12 considerations have been addressed, and the Commission
13 has the information necessary to make the required
14 findings for issuance of the Turkey Point COL.

15 I also want to recognize the
16 professionalism and thoroughness of our FPL team in
17 addressing the information needs and emergent issues
18 required to complete the COLA review.

19 FPL, Bechtel, Westinghouse, Rizzo, and the
20 rest of the Turkey Point 6 and 7 COLA team invested
21 several hundred thousand man-hours to prepare the COL
22 application and to complete the COLA review.

23 Despite the significant and unique
24 challenges that we and others have faced in completing
25 the COLA review, FPL fully supports the standard

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1 design approach. We have benefitted from the lead
2 plant applications, ongoing construction activities,
3 and believe that our experience will also benefit
4 subsequent applicants.

5 It should be no surprise that with a new
6 design that there are emergent issues that must be
7 addressed. We believe that the benefits of a
8 certified and standard design will not be fully
9 realized until completion of the first of a kind
10 construction currently in progress.

11 Our work to address the emergent industry
12 issues and AP 1000's specific issues has not reduced
13 our confidence in the safety of the AP 1000 design and
14 the significant value of passive safety systems.

15 Obtaining this Turkey Point COL is key to
16 FPL's ability to meet generation and resource
17 requirements. Our planning identifies base load
18 generation needs that support the addition of the
19 Turkey Point plant.

20 Having a COL minimizes construction risk
21 and provides us the ability to implement 2200
22 megawatts of nuclear generation five to seven years
23 faster than would otherwise be possible. These are
24 significant strategic considerations in making a final
25 decision on whether to move forward with a

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1 multibillion dollar mega-project.

2 The company will make a final decision on
3 new nuclear generation in Florida in the future based
4 on, among other factors, energy needs, project costs,
5 carbon regulation, natural gas prices, existing or
6 future legislative provisions for cost recovery, and
7 the requirements of the NRC's combined operating
8 license.

9 Commissioners, thank you again for your
10 efforts. We welcome any further questions you may
11 have regarding the Turkey Point 6 and 7 combined
12 license application.

13 CHAIRMAN SVINICKI: Thank you very much.
14 I now invite the NRC staff to make its closing
15 statement.

16 MS. ORDAZ: Thank you, Chairman. We thank
17 you for the opportunity to speak today. In the
18 staff's paper to the Commission pertaining to this
19 mandatory hearing, the staff's final safety evaluation
20 report, and the final environmental impact statement,
21 and in our presentations to you during this hearing,
22 we have provided an adequate basis for making the
23 necessary finding set forth in 10 CFR 52.97 and 10 CFR
24 51.107 to support the issuance of the combined
25 licenses for Turkey Points Units 6 and 7.

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1 In this hearing, we've described why the
2 staff's review of the Turkey Point Units 6 and 7
3 combined license application has been both thorough
4 and complete. The review was appropriately focused by
5 the finality afforded to issues within the scope of
6 the AP 1000 design certification.

7 The staff has demonstrated the
8 thoroughness of our review in part through its
9 reliance on staff guidance and interactions with the
10 ACRS. The ACRS agrees with the staff's conclusion
11 that the combined licenses for Turkey Point Units 6
12 and 7 should be issued.

13 Today, we highlighted certain aspects of
14 our safety and environmental reviews. During the
15 staff's safety panel, we explained the staff's
16 evaluation of storm surge and sea level rise and deep
17 well injection for liquid radioactive waste disposal.

18 With regards to the low population density
19 criterion discussed this morning, we would like to
20 clarify for the record that it should have been 500
21 people per square mile as opposed to 500 people per
22 square meter.

23 PARTICIPANT: Yeah.

24 MS. ORDAZ: During the staff's
25 environmental panel, we discussed cooling water

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1 sources, alternative sites, critical habitat in
2 consultation with the U.S. Fish and Wildlife Service
3 and the National Marine Fisheries Service. We also
4 highlighted our process for compliance with the NRC's
5 National Environmental Policy Act, regulations
6 specified in 10 CFR Part 51, and other applicable
7 environmental statutes, and appropriate interactions
8 with other government agencies and the public.

9 We are similarly confident that through
10 the ITAAC process, the construction reactor oversight
11 process, inspections of construction activities, and
12 oversight of the transition from construction to
13 operation, we will be able to confirm that the plant
14 has been constructed and will operate in conformance
15 with the licenses, the Atomic Energy Act, and the
16 Commission's regulations.

17 The applicant understands the necessity of
18 complying with the requirements, and also understands
19 what needs to be done if any noncompliance is
20 discovered including determining the safety
21 significance, determining operability, determining the
22 extent of condition, and taking prompt corrective
23 action to restore compliance.

24 In those instances in which we relied on
25 commitments, we have done so in accordance with the

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1 Commission's commitment policies and practices. We
2 have verified that there is an established process by
3 which the licensee maintains commitments and
4 implements changes, and we of course oversee those
5 changes if any are made. The staff appreciates the
6 opportunity to present to the Commission today the
7 results of our thorough and complete review.

8 And before I conclude my final remarks, I
9 want to take a brief moment to reflect on our progress
10 at implementing Part 52. This marks the eighth
11 mandatory hearing and the last for a combined license
12 application for a large light water reactor. We have
13 learned much since the initial hearings for Vogtle and
14 Summer, and have revised our internal procedures to
15 reflect those lessons learned.

16 Because many of us here today may not be
17 present for the next combined license mandatory
18 hearing, we have undertaken efforts to
19 institutionalize those best practices and internal
20 staff documents, and are examining how best to retain
21 those practices as the NRO and NRR merge in the near
22 future. There's a specific working group under the
23 merger efforts focused on KM activities.

24 I want to thank this moment to thank the
25 current Commission and the past Commissioners for

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1 their active engagement in the licensing process.
2 Your questions have encouraged the staff to better
3 explain its basis supporting licensing decisions and
4 to be better able to articulate those bases in a
5 public and transparent manner.

6 And finally, I want to publicly commend
7 the tremendous staff from NRO and all of our
8 supporting business lines who provided information
9 today in this hearing and in past hearings. These
10 individuals worked tirelessly every day to resolve the
11 technical issues in support of the NRO mission. This
12 concludes my remarks. Thank you, Chairman.

13 CHAIRMAN SVINICKI: Thank you very much,
14 Vonna. I thank both the applicant and the staff for
15 their closing statements. Before we proceed to
16 Commissioners' closing remarks, I'd like to ask my
17 fellow Commissioners if they have any questions
18 associated with the closing statements by the parties
19 or otherwise? Okay, seeing shaking of heads, I will
20 now recognize Commissioner Baran for any closing
21 remarks he'd like to make.

22 COMMISSIONER BARAN: I just want to thank
23 the NRC staff and all of today's participants for your
24 hard work throughout the review of this application
25 and for your thorough preparation for today's hearing.

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1 We really appreciate it. Thank you.

2 CHAIRMAN SVINICKI: Thank you.

3 Commissioner Burns?

4 COMMISSIONER BURNS: I'll echo that, the
5 same appreciation to the staff and the applicant for
6 their preparation for today's hearing, and the
7 testimony, as well as the answers to the questions
8 that we've posed them.

9 I also want to acknowledge with respect to
10 the NRC, the participation of sister agencies and
11 organizations such as Oak Ridge National Laboratory,
12 the Army Corps of Engineers, as well as the National
13 Park Service, Fish and Wildlife Service, and the EPA.
14 These are important, as I noted in my last question
15 there. There are a lot of folks who are potentially
16 involved to inform our decision making, so I want to
17 express my appreciation to them as well as to the NRC
18 staff. Thank you.

19 CHAIRMAN SVINICKI: Thank you. Before I
20 close with some closing procedural matters, let me
21 give my closing remarks as a member of the Commission
22 and not as the Chairman presiding.

23 Vonna, I appreciate your remarks about the
24 somewhat important milestone that we encounter here
25 today for the Nuclear Regulatory Commission. Having

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1 been here for the first of these mandatory hearings
2 that were conducted in the modern era, and Frank is
3 nodding his head, that felt very historic in that
4 moment as well, and although there continues to be new
5 reactors licensing work before the agency, it is true,
6 and we should acknowledge that today's is the last COL
7 mandatory hearing of those that we have contemplated.

8 The staff of NRO under leaders over the
9 last, I would say, four or five years, have been
10 pushing very, very hard, pushing the capable team of
11 folks that you have in the New Reactors Office to get
12 to this milestone today.

13 So as NRO and NRR prepare for a future new
14 organizational structure where work on new reactors
15 will continue to go on, but in a different
16 organizational structure, I think that today is a
17 significant milestone, so I commend you, and it's been
18 a very long journey, and it's not just those of you
19 sitting at the table here, but all of the folks here
20 today, and the witnesses, and experts who contributed
21 to previous reviews as well.

22 I also commend the applicant on a very
23 vigorous and thorough defense of the application. You
24 all have been engaged in a very long endeavor as well,
25 and articulating it as 57 man-years of work makes - I

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1 don't know. It makes me fatigued. I don't know about
2 anybody else in this room. I'm tired just hearing
3 that. That sounds like a really, really significant
4 effort which indeed it was.

5 Also I want to acknowledge of course, as
6 a Commission we can't successfully conduct these
7 mandatory hearings without the able support of the
8 Office of the Secretary, the Office of Commission
9 Appellate Adjudication, and the Office of General
10 Counsel, and all of those elements of the Office of
11 Administration that support us, and all of the
12 administrative support that each of us has in the work
13 we do here day to day, so I thank them for that.

14 And I will now conclude with the important
15 procedural matters for the parties who aren't off the
16 hook yet, so in closing and for the information of the
17 parties, the deadline for responses to any
18 post-hearing questions will be January 9, 2018 unless
19 the Commission directs otherwise.

20 The secretary plans to issue an order with
21 post-hearing questions, if any, by December 19, 2017.
22 The deadline for transcript corrections will be
23 January 9. The secretary plans to issue an order
24 requesting proposed transcript corrections by December
25 18.

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1 As I mentioned this morning in my opening,
2 the Commission expects to issue a final decision
3 promptly with due regard to the complexity of the
4 issues. With that, the hearing is adjourned. Thank
5 you.

6 (Whereupon, the above-entitled matter went
7 off the record at 2:43 p.m.)

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
FLORIDA POWER & LIGHT COMPANY) Docket Nos. M-52-040 and 52-041-COL
(Juno Beach, Florida))
)
(Turkey Point, Units 6 & 7))

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing **ORDER (Setting Deadline for Proposed Transcript Corrections)** have been served upon the following persons by Electronic Information Exchange.

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[Original signed by Brian Newell _____]
Office of the Secretary of the Commission

Dated at Rockville, Maryland,
this 18th day of December, 2017.