UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD
Michael M. Gibson, Chairman
Dr. Michael F. Kennedy
Dr. William W. Sager

In the Matter of	)	
	)	
FLORIDA POWER & LIGHT COMPANY	)	Docket Nos. 50-250-LA
	)	and 50-251-LA
	)	
Turkey Point Nuclear Generating,	)	ASLBP No. 15-935-02-LA-BD01
Units 3 and 4)	)	

March 28, 2016

CITIZENS ALLIED FOR SAFE ENERGY
PROPOSED FINDINGS OF FACTS
AND CONCLUSIONS OF LAW
REGARDING THE AUGUST 14, 2014 NRC EA AND FONSI

Pursuant to 10 C.F.R. § 2.1209 and 10 C.F.R. § 2.712(c) and as directed in this Board's ORDER of January 17, 2016 Citizens Allied for Safe Energy, Inc. (CASE) hereby submits its PROPOSED FINDINGS OF FACTS AND CONCLUSIONS OF LAW in the subject matter (NRC-009) in a timely manner.

BACKGROUND

On July 10, 2014, Florida Power and Light, Inc (FPL) submitted a license amendment request (LAR) by letter (FPL-008) to the Nuclear Regulatory Commission (NRC). Letters dated July 17, 2014 (NRC-018), July 22, 2014 (NRC-012) and (NRC-013), and July 24,(NRC-014) supplemented the original request.

On August 14, 2014 the NRC filed a notice of Environmental Assessment And Final Finding Of No Significant Impact (2014 EA) (NRC-042) into the Federal Register.

On October 14, 2014 CASE filed a Petition To Intervene and Request for a Hearing (INT-038) regarding the 2014 EA.

On January 14, 2015 this Board: conducted a hearing in Homestead, Florida for oral argument to determine whether CASE had standing and whether its proffered contentions were admissible..

On March 23, 2015 this Board issued a MEMORANDUM AND ORDER (Granting CASE's Petition to Intervene) (ORDER). CASE was granted standing and the admission of one contention.

On January 11-12, 2016 this Board conducted an Evidentiary Hearing on the subject matter in Homestead, Florida.

STATEMENT OF THE ISSUES

The March 23, 2015 Board ORDER, at 24, reads

> "…the Board admits Contention 1, narrowed and reformulated to read as follows:
>
> > The NRC's environmental assessment, in support of its finding of no significant impact related to the 2014 Turkey Point Units 3 and 4 license amendments, does not adequately address the impact of increased temperature and salinity in the CCS on saltwater intrusion arising from (1) migration out of the CCS; and (2) the withdrawal of fresh water from surrounding aquifers

to mitigate conditions within the CCS.

Of course, the question whether the EA is, in fact, sufficient to satisfy the NRC Staff's NEPA requirements is not the focus of our in of our inquiry here but must await consideration at a full evidentiary hearing."

These are the only matters being considered in this discussion.

FINDINGS OF FACTS

1 The Atomic Energy Act of 1954, 42 U.S.C. § 2011 et seq., is a United States federal law that is, according to the Nuclear Regulatory Commission, "the fundamental U.S. law on both the civilian and the military uses of nuclear materials."[1] It covers the laws for the development, regulation, and disposal of nuclear materials and facilities in the United States.

2 The U.S. Nuclear Regulatory Commission (NRC) was created as an independent agency by Congress in 1974 to ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment. The NRC regulates commercial nuclear power plants and other uses of nuclear materials, such as in nuclear medicine, through licensing, inspection and enforcement of its requirements.

3 Florida Power & Light Company (FPL), the principal subsidiary of NextEra Energy Inc. (formerly FPL Group, Inc.), is a Juno Beach, Florida-based power utility company[1] serving roughly 4.7 million accounts and 9 million people in Florida. It generates, transmits, distributes and sells electric energy.

4 Citizens Allied for Safe Energy, Inc./CASE is a Florida Not-For-Profit corporation based in Miami, Florida with a commitment to renewable, sustainable energy and protection of the environment.

5 Turkey Point Nuclear Generating Station is a twin reactor nuclear power station located on a 3,300-acre (1,300 ha) site 2 miles east of Homestead, Florida, United States, next to Biscayne National Park located about 25 miles (40 km) south of Miami, Florida near the southernmost edge of Miami-Dade County. Turkey Point is owned by Florida Power & Light. Including the two nuclear plants, Turkey Point operates five power-generating units. It comprises two 400-megawatt oil/natural gas-fired generation units (Units 1 and 2) and two nuclear Westinghouse pressurized water reactors (Units 3 and 4), each supplying steam to one high pressure and two low-pressure turbines with a power output rated at 693 MWe for each unit. In 2007, it added the 1,150 MW combined-cycle gas-fired Unit 5.It serves the entire southern portion of Florida. With a combined capacity of 3330 MW, the site is the largest generating station in Florida and is the sixth largest power plant in the United States.

6 The Cooling Canal System (CCS). CASE has presented and described the ecology and geography of the CCS exhaustively in its filings in these proceedings so a review of them will not be presented here except as specifically referenced in comments below. Specifically, INT-001, INT-047 and in CASE's Initial Statement of Position (INT-000 - redlined ML16015A334).

FACTS FROM NRC DOCUMENTS JULY 10, 2014 TO AUGUST 24, 2014

Letter to NRC July 10, 2014, at 1**: (FPL-008)**

7 Subject: License Amendment Request No. 231, Application to Revise Technical Specifications to Revise Ultimate Heat Sink Temperature Limit

8 Pursuant to 10 CFR 50.90 and 10 CFR 50.91 (a)(5), Florida Power & Light Company (FPL) hereby requests an amendment to the Technical Specifications (TS) for the Turkey Point Nuclear Plant (Turkey Point), Units

3 and 4.

9 *The proposed amendment would revise the ultimate heat sink (UHS) water temperature limit from I00°F to 104°F. The cooling canal system (UHS) temperature has been recently trending higher than historical averages and has approached the current limit. Therefore, FPL requests a timely review of this application because of the potential for the current limit to be exceeded.*

10 *The enclosure to this letter contains a description of the proposed change and includes a no significant hazards determination and environmental considerations.*

11 *There are no new commitments made in this submission.*

12 *FPL requests that this application be approved by August 30, 2014.*

13 *The proposed change has been evaluated in accordance with 10 CFR* 50.91(a)(1) using criteria in 10 CFR 50.92(c) **and it has been *determined that this change involves no significant hazards consideration.***

14 *The Turkey Point Plant Nuclear Safety Committee has reviewed and approved the proposed license amendment. In accordance with 10 CFR 50.91(b)(1), a copy of this letter is being forwarded to the State Designee of Florida. Ms.Cindy Becker, Florida Department of Health*

Enclosure, at 2,

15 Florida Power & Light Company (FPL) proposes a revision to the Ultimate Heat Sink (UHS) temperature limit from 100°F to 104'F.

Background, at 4

16 *In June 2014, UHS temperatures almost approached the currently analyzed maximum temperature of 100°F. Engineering and environmental analysis has determined that the cooling water heat transfer capability is diminished due to the presence of a higher than normal algae content. While immediate eradication of the algae is possible, there are biological impacts from a sudden algae die off and decay that must be mitigated and/or avoided. Thus, a controlled chemical treatment of the canal system over the course of several weeks is planned to gradually reduce the near-term algae content and improve heat transfer efficiency. If UHS temperatures were to exceed the current I 00'F TS limit during the treatment period and ensuing summer months, a plant shutdown would have to be initiated in accordance with the action requirements of TS 3/4.7.4, increasing the possibility of a shutdown transient. Adoption of the proposed TS change would allow continued plant operation with measured UHS temperatures less than or equal to 104'F.*

17 FPL LETTER JULY 17, 2014 TO THE NRC, (NRC-018)

Turkey Point Units 3 and 4
Basis for Emergency
Concerning License Amendment Request No. 231
Application to Revise Ultimate Heat Sink Temperature Limit

1.0 Background

An algae bloom in the Turkey Point cooling canal system (CCS) has reached a level of cell concentration that is reducing cooling efficiency. ***Along with reduced water levels due to lower than normal rainfall,*** *the CCS is experiencing cell concentrations of algae higher than previously observed, as well as, occurring earlier in the year than previous blooms. 17A*

17A

CASE: Case addresses this allegation of reduced rainfall in its Petition, at 8-9, and at 12, extensively. CASE's research showed that concurrent measures a few miles away were significantly different. CASE also showed that similar readings at Turkey Point in the past did not produce the situation for which FPL was seeking relief. There is no report of the NRC Staff seeking corroboration from on site NRC Staff or from an independent source regarding rainfall in the area. Licensee data and conclusions were accepted as fact. Were the gauges properly calibrated and functioning?

2014 EA AND FONSI (NRC-009)

The 2014 EA (NRC-042) states, at 1:

18 *SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of amendments to Renewed Facility Operating License Nos. DPR-31 and DPR-41 issued to Florida Power & Light Company (FPL, the licensee) for operation of Turkey Point Nuclear Generating Unit Nos. 3 and 4 (Turkey Point) located in Homestead, Miami-Dade County, Florida. The proposed amendments would increase the ultimate heat sink (UHS) water temperature limit specified in the Turkey Point Technical Specifications (TSs) from 100 degrees Fahrenheit CF) to 104 oF and* ***add a surveillance requirement*** *to monitor the UHS temperature more frequently if the UHS temperature approaches the new limit.* ***The NRC did not identify any significant environmental impacts*** *associated with the proposed license amendments based on its evaluation of the* ***information provided in the licensee's application and other available information.*** *Accordingly, the NRC has prepared this Environmental Assessment (EA) and Final Finding of No Significant Impact (FONSI) for the proposed license amendments. (emphasis added)*

2014 EA, at 3,

19 *Based on **information provided in FPL**'s application and associated supplements, the **NRC staff's independent review**, and the NRC's **consultation with the U.S. Fish and Wildlife Service** (FWS) pursuant to section 7 of the Endangered Species Act of 1973, as amended (ESA), the NRC did not identify any significant environmental **impacts** associated with the proposed license amendments.*

20 **CASE:** The highlighted statements would indicate that the NRC Staff made no new inquires or requested any verification of FPL's information and relied on "off the shelf" data and reports in spite of the dramatic and unpredicted events being reported by FPL and that needed to be addressed. The addition of a surveillance requirement seemed sufficient to allay any concerns that Staff might have had despite the enormity of the CCS and the complexity of the ecosystem involved, a 4,000 square mile aquifer and wetland system with which the unlined CCS interacts, one must question this lack of inquiry and absence of analysis to reach a FONSI conclusion. The impacts of the actions being approved were not fully vetted nor were any proactive initiatives considered which might have revealed them..

20A
CASE: " NRC's consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973." at Paragraph 19 . The 2014 EA makes no reference as to the impact on non-endangered wildlife. The FWS limits its administration almost exclusively to endangered species.

at 4,

21 *The U.S. Atomic Energy Commission (AEC), the NRC's predecessor agency, and the NRC **have previously conducted environmental reviews of Turkey Point in several documents, and the descriptions therein continue to accurately depict the Turkey Point site and environs.** Those documents include **the AEC's July 1972 Final Environmental Statement (FES); the NRC's January 2002 Generic***

Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Turkey Point Units 3 and 4

—Final Report (NUREG-1437, Supplement 5) (ADAMS Accession No. ML020280236); and the NRC's March 2012 environmental assessment and final FONSI for the Turkey Point extended power uprate (EPU) (ADAMS Accession No. ML12074A251).

21A
CASE: In view of the emergency situation described in Paragraph 82 depending upon 42 year old and 12 year old documents to define a current aberrant seems parsimonious and inadequate for the task at hand.

SHORT DURATION

2014 EA, at 6,

*22 If approved, the LAR would be effective from the date of NRC approval **through the expiration** dates of the renewed facility operating licenses (i.e., through 2032 for Unit 3 and 2033 for Unit 4).*

at 9,

*23 Under the proposed action, the CCS could experience temperatures between I00°F to 104°F. at the TS monitoring location near the north end of the system **for short durations** during periods of peak summer air temperatures and low rainfall. Such conditions may not be experienced at all depending on site and weather conditions. Temperature increases would also increase CCS water evaporation rates and result in higher salinity levels. This effect would also be **temporary and short in duration b**ecause salinity would again decrease upon natural freshwater recharge of the system (i.e.,through rainfall, stormwater runoff, and groundwater exchange). **No other onsite or offsite waters would be affected by the proposed UHS temperature limit increase.***

23A

CASE: The two statements immediately above seem incongruous. If a situation is only going to be of short duration, why would you approve the intended actions for the life of the reactors? And who would bet on the weather in South Florida especially in the face of global warming and constant record breaking temperatures in the area and elsewhere. Staff might have meant that any one event might be of short duration but, considering that the action being approved in this EA will be in place **for the life of the two reactors**, one might expect a higher degree of inquiry and attention to the implications over that extended time including provisions for revisiting and reviewing the course and results of the action being taken. And the statement that no other onsite or offsite waters would be affected belies the extensive, constant and intrusive nature of the interaction of CCS and the 4,000 square mile South Florida Aquifer. CASE'S entire petition speaks to this interaction.

2014 EA, at 6,

24 *The Need for the Proposed Action*

The proposed action is needed to provide FPL with additional operational flexibility during periods when ***high air temperatures,low rainfall, and other factors*** *contribute to conditions resulting in a UHS temperature in excess of hat would otherwise necessitate FPL to place Turkey Point in cold shutdown. In its application, FPL states that loss of load and voltage control resulting from shutdown during periods of high summer demand could result in* ***impacts to grid reliability.*** *UHS temperatures have recently approached and exceeded the I00°F TS limit on several occasions.*

24A

CASE: The 2014 EA does not explain or challenge the reference to grid reliability or explain exactly what insurmountable challenges reducing power in the reactors would present.. Since that is the main reason FPL asserts that it could not change the operation of the reactors, a thorough analysis would have requested a detailed explanation of what that meant at that time and in that context especially in view of the drastic measures being proposed, and not yet proposed, but which analysis might have uncovered as probable, including the withdrawal of hundreds of MGD in freshwater from the Biscayne Aquifer.

2014 EA, at 7,

25 ***Therefore, this environmental assessment does not prevent any further evaluation of the operational impacts on these environmental resources.***

25A

CASE; So, why didn't they do more? Or at least set a follow up period at which time they would reassess the the situation and the impact of the mitigation proposed?

2014 EA, at 7-8 ,

26 ***Based on the above and the available information reviewed by the staff,*** *the NRC concludes that the proposed action would result in no significant impact on land use, visual resources, air quality, noise,* ***the geologic environment, groundwater resources, terrestrial resources,*** *historic and cultural resources, socioeconomic conditions including minority and low income populations (environmental justice), or waste generation and management activities. The NRC previously assessed the environmental impacts of continued operations of Turkey Point in*

NUREG-1437,Supplement 5 and the EA and final FONSI for the EPU, and implementation of the proposed license amendments ***would not result in any impacts*** *beyond those already characterized in these documents. Accordingly, this* ***environmental assessment focuses on*** *the environmental resources that* ***could be affected by the change in the CCS thermal limit:*** *surface water resources, aquatic resources, and Federally-protected species and habitats.*

26A

CASE: ***"Based on the above and the available information reviewed by the staff,"*** **(highlighted above).** Exactly to the point of Contention 1; no new or additional inquiry or assessment was done even in the face of an exigent or emergency situation, which the EA does not mention.. Further, these conclusions and indicated parameters (bold above) of the 2014 EA limit the NRC Staff concerns and inquiries to conditions within the CCS. No mention is made of the impact of actions being authorized beyond the physical boundaries of the CCS.,

2014 EA, at 10,

27 *The CCS supports a variety of aquatic species typical of shallow, subtropical waters, including phytoplankton, zooplankton, marine algae, rooted plants, crabs, and estuarine fish. Because of high water temperatures and salinity content of the CCS, the resident fish assemblage is dominated by species* ***adapted to living in harsh conditions****, such as sheepshead minnow (Cyprinodon variegatus) and several Fundulus species. (emphasis added)*

27A

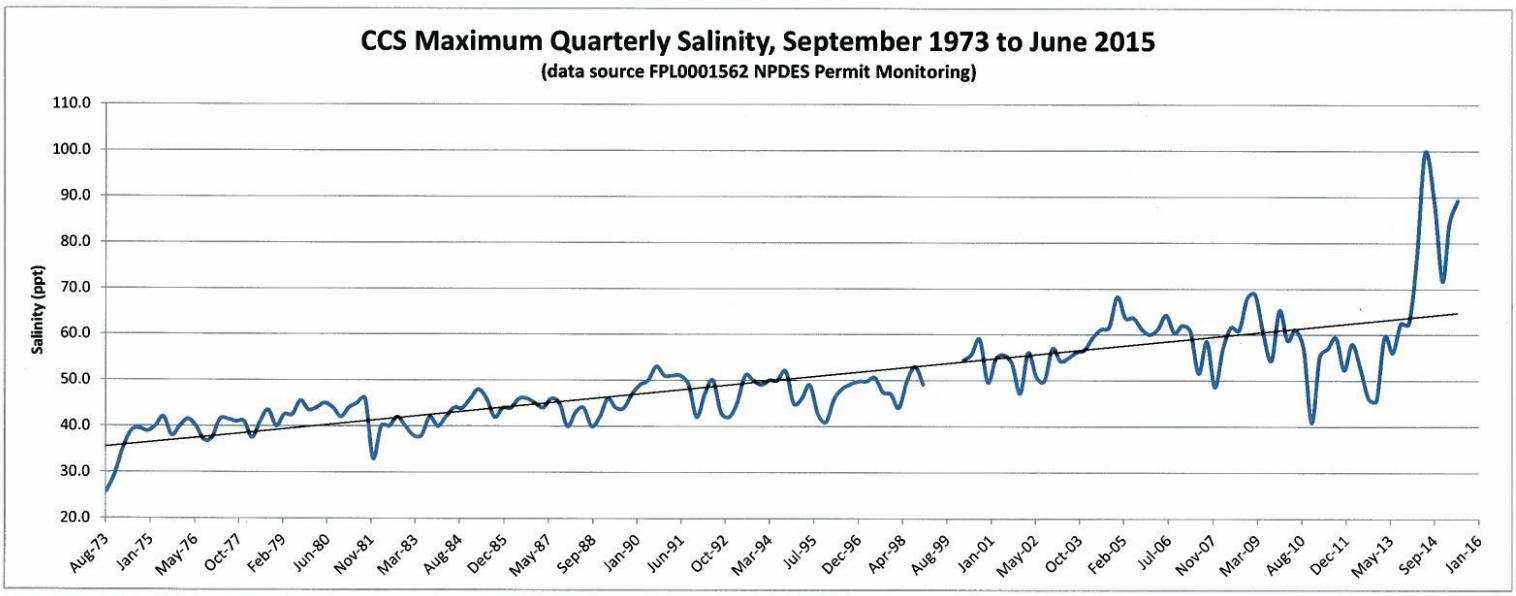
CASE: In CASE's Joint Rebuttal (INT-076) at 6-7, Dr. Philip K Stoddard, Biologist, CASE expert witness, states in response to the foregoing statement:

28 *The highest known spawning temperatures for any ray-finned fish is 93°F (34°C) for Cyprinodon nevadensis (Shrode & Kerking 1997). Short-term exposure (hours) to 34°C reduces survival egg survival by 50% in Cyprinodon macularis (Kinne & Kinne 1962). Local species of Cyprinodon and Fundulus, while relatively heat-tolerant, are unlikely to match the desert species Cyprinodon nevadensis for heat tolerance. Gametogenesis in all animals (except birds) is disrupted at temperatures exceeding 95°F (35°C) (Kim et al. 2013, Moatani & Wainright 2015). The increase in allowable peak temperature signifies a concomitant increase in the time that the water temperatures will exceed the* ***maximum temperature for fish reproduction.*** *Thus, even if the fish and invertebrates residing in the canals are able to survive for the duration of elevated water temperatures, their reproduction is inhibited, and thus populations will diminish.*

28A

CASE: The 2014 EA does not address the impact on wildlife of exorbitant increases in temperature and salinity. The EA assumes everything would be of a short duration; a dangerous assumption if you live in and depend upon the CCS to sustain your life. Dr. Stoddard notes one example of reproductive disruption; the crocodile reproductive cycle is similarly vulnerable. As a biologist, he could also note the impact of high salinity on kidneys. And FWS is only concerned with endangered species.

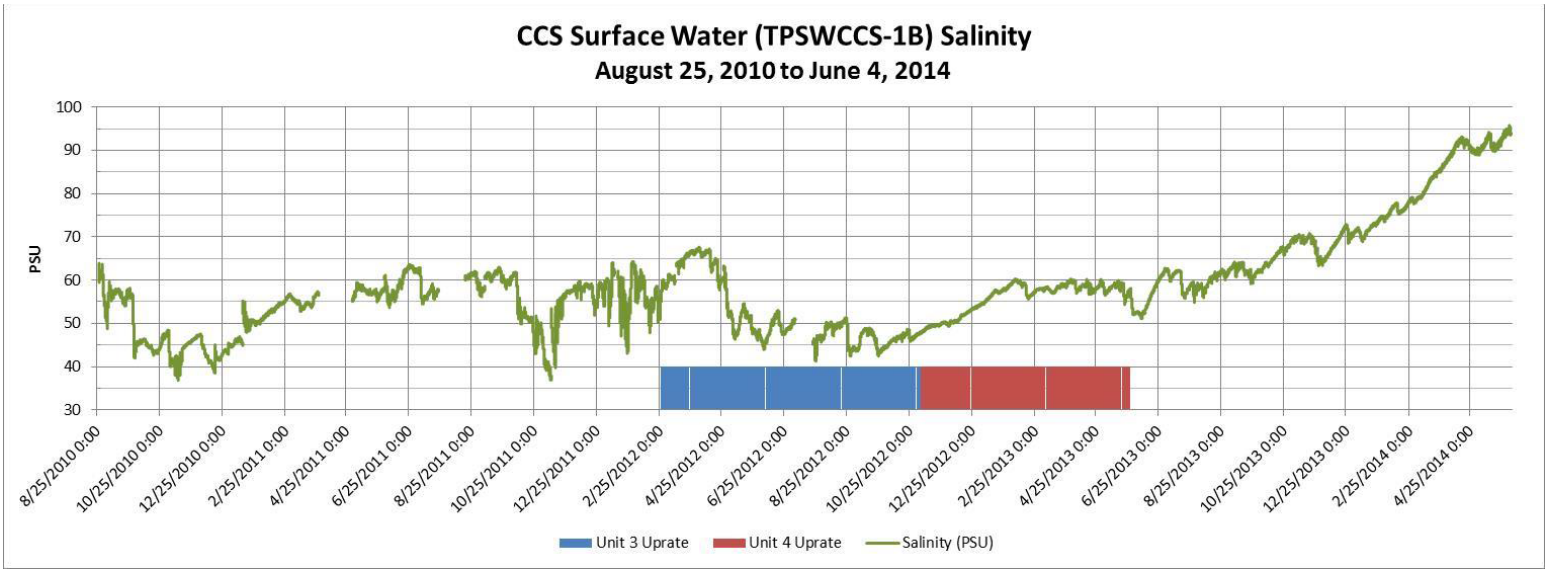
SALINITY


CCS Maximum Quarterly Salinity, September 1973 to June 2015
(data source FPL0001562 NPDES Permit Monitoring)
Salinity (ppt)
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
Aug-73
Jan-75
May-76
Oct-77
Feb-79
Jun-80
Nov-81
Mar-83
Aug-84
Dec-85
May-87
Sep-88
Jan-90
Jun-91
Oct-92
Mar-94
Jul-95
Dec-96
Apr-98
Aug-99
Jan-01
May-02
Oct-03
Feb-05
Jul-06
Nov-07
Mar-09
Aug-10
Dec-11
May-13
Sep-14
Jan-16

INT-003, Graph, CASE SOP, at 23 *CCS Maximum Quarterly Salinity,* September 1973 to June 2015. Miami-Dade County DERM based on FPL data

29

CASE: According to the graph above (INT-003) salinity in August, 1973, when the CCS was built, measured about 26 ppt, less than that of sea water which is about 34 ppt. Salinity increased at a steady rate of about 5% per decade reaching 60 ppt in March of 2009, 36 years later. From then until about September 2013 salinity dropped below average. When both unites came back on line in July, 2014 salinity increased to 100 ppt. This graph shows that salinity increase at a rate of about 1.39 per year until after the EPU. Without the EPU salinity probably would have continued to increase as the same rate eventually creating the circumstance which occurred in July, 2014. Did the EPU cause these problems or was it the weather? The 2014 EA does not pose the question. Concurrence is not causality but it also cannot be assumed to be coincidence. The 2014 EA took none of this into account. Nor did any other agency except DERM.



30

INT-002 Slide 13. SurfaceWater Salinity for CCS Surface Water Station

31

JUDGE KENNEDY:
It seems like there were
1 things going on and all we want to point to is the
2 temperature change.
3 MR. FORD: Yes, the previous EAs
4 considered -- the environmental assessments prior to
5 the ultimate heat sink considered the operation of the
6 CCS. But in my opinion, t**he interactions you are**
7 seeing with the state and people worrying about these
8 salinity conditions, this is a result of the long-term
9 operation of the CCS and would be going on independent
10 of this power uprate decision.
11 JUDGE KENNEDY: But are you suggesting
12 that it wouldn't need to be looked at as part of the
13 environmental assessment?
14 MR. FORD: Sorry, I meant the ultimate
15 heat sink power. Corrected here.
16 So, I'm sorry. Could you repeat your
17 question again?
18 JUDGE KENNEDY: Yes, and I sort of
19 interrupted you. I guess I get it. I mean I know
20 there seems to be a focus on this temperature change,
21 the tech spec limit change but yet, t**here was a lot of**
22 environmental things going on at the same time. And
23 I guess from my perspective, I see some obligation on
24 the part of the staff, unless you can convince me
25 otherwise to look at all what is going on here. And
438
1 I**'m trying to understand why the temperature change**
2 plus all what is going on wasn't part of all that
3 needed to be looked at, as part of this license
4 amendment request and from a NEPA

32

CASE: Both of the graphs above show a post EPU increase in salinity in the CCS of over 50%. These graphs were created by DERM based on

information provided by FPL to them and to the NRC and to the FDEP. DERM is the only agency to review and analyze this data. As Mr Ford, an NRC geologist observes at paragraph 31, lines 8-10, **"*these salinity conditions, this is a result of the long-term operation of the CCS and would be going on independent of this power uprate decision.*"** This exactly what Graph INT-003, Maximum Quarterly Salinity, at paragraph 29 and INT-002, Slide 13, at paragraph 30, show. Mr Ford, at 32A, states further, ***Now the changes that you see in salinities are a result of the long-term operation of this facility for 43 years.*** Mr. Ford was not a part of the 2014 EA team or there might have been a different outcome.

We see here that the water within the CCS has became hypersaline over time and the water down to the base of the aquifer is the same with some lens of freshwater. Recently, FPL, has brought the salinity down to about 25 ppt using hundreds of millions of gallons of freshwater from the L-31E canal but that is not sustainable over time since that source is only available for part of the year and then under special circumstances. Eventually the CCS will become dysfunctional. And maybe, an eon from now, the wetlands will return to nature.

32A

TRANSCRIPT January 11, 2016
436
15 MR FORD: **Now the changes that you see in salinities**
16 are a result of the long-term operation of this
17 facility for 43 years.

MITIGATION

33
2014 EA.
at 9

The Florida Department of Environmental Protection (FDEP) has issued FPL a "No Discharge" National Pollutant Discharge Elimination System (NPDES) permit (No. FL0001562) to operate the CCS as an industrial wastewater facility. Accordingly, the CCS does not discharge directly to ***fresh*** *or marine surface* ***waters.***

CASE: This is the only mention of freshwater in the 2014 EA. And it is patently wrong. At many points in every filing in this matter by every party mention has been made of the interchange between the porous unlined CCS and the Biscayne Aquifer from which it was carved out. The NOV (INT-005) is concrete evidence of this as is the illustration INT-062 (INT-002, Slide 10) Migration of Water From the Turkey Point Cooling Canal System.

34
at 9

Temperature increases would also increase CCS water evaporation rates and result in higher salinity levels.

CASE: This 2014 EA statement recognizes these facts but does not pursue their scope and ultimate impact regarding the parameters at hand or any other possible factors; it is the most prescient observation in the entire 2014 EA. If this line of inquiry had been followed, we might not be in this current inquiry and discussion. The 2014 EA is ipso facto inadequate for this one shortcoming alone.

35 at 10

Because the proposed action would only affect the CCS, and the CCS is a manmade closed cycle cooling system, the NRC concludes that the proposed action would not result in significant impacts to surface water resources.

36 at 14

On June 27, 2014, the FDEP approved FPL's treatment plan for a 90-day trial period (letter contained in Appendix A of ADAMS Accession No. ML 14206A806). The FDEP requested that during the 90-day treatment period, FPL monitor the CCS for total recoverable copper and dissolved oxygen and submit its results to the FDEP.

37 at 14,

The CCS is situated above two aquifers: the shallower ***saltwater*** *Biscayne Aquifer and the deeper brackish Floridan Aquifer.*

38 The current and anticipated future aquifer withdrawals have the potential to **contribute to cumulative effects** on CCS surface water resources, CCS aquatic resources, and crocodiles.

39 Because the CCS is a manmade closed cycle cooling system, aquifer withdrawals are **not likely to have a significant cumulative effect on surface water resources.**

40

Aquifer withdrawals would result in **beneficial impacts t**o CCS aquatic resources and the crocodiles inhabiting the Turkey Point site.

41 FPL anticipates that the **withdrawals will reduce the salinity of the** CCS to about 34 ppt and could also help moderate CCS **temperatures over the long term.** Both of these effects would create favorable conditions for CCS aquatic biota and crocodiles, which are currently tolerating an unusually hot, hypersaline environment

41A

CASE: Not one of the statements above, paragraphs 35 to 41, is accurate or uncontroverted in CASE's filings; some are obscure. At this

point, to enumerate the arguments against each one would not seem to serve any productive purpose other than to bring to this exact point from other points in the discussion the inadequacy of the 2014 EA and FONSI.

at 15-16

42 The South Florida Water Management District (SFWMD) recently granted FPL approval to withdraw a portion (approximately 5 million gallons per day [MGD]) of the Unit 5 withdrawal allowance for use in the CCS.

43 FPL began pumping Floridan Aquifer water into the CCS in early July.

44 FPL has also received temporary approval to withdraw 30 MGD from the Biscayne Aquifer, though FPL has not yet used this allowance.

45 FPL also anticipates the FDEP to issue an Administrative Order
requiring FPL to install up to six new wells that will pump approximately 14 MGD of water from the Floridan Aquifer into the CCS.

46 Modeling performed by FPL consultants and the SFWMD indicates that in approximately 2 years, the withdrawals would reduce the salinity of the CCS to the equivalent of Biscayne Bay (about 34 parts per thousand [ppt]).

47 Such withdrawals could also help moderate water temperatures.

48 The current and anticipated future aquifer withdrawals have the potential to contribute to cumulative effects on CCS surface water resources,

SCIENTIFIC FACTS FROM FILINGS AND EXHIBITS IN THIS MATTER

CASE: NONE OF THE INFORMATION BELOW APPEARS IN THE NRC STAFF 2014 EA AND FONSI.

SALTWATER INTRUSION AND TEMPERATURE

49 2010 USGS Borehole geophysical logging for the Florida Power & Light Turkey Point Plant groundwater, surface water, and ecological monitoring plan: (INT-044)_

Study Area: Miami-Dade County, Florida
Period of Project: February 2010 through September 2010
Principal Investigators: Kevin J. Cunningham, Robert A. Renken, Dorothy Payne
Co-Investigators: Michael A. Wacker, Jeffrey F. Robinson
Cooperator: Florida Power & Light Company

50

Background:

The effect of salinity and temperature (emphasis added) differences and aquifer heterogeneity on density-driven convection, and the combined impact on surface water, groundwater, and ecologic conditions is being evaluated at the Florida Power & Light Company (FPL) Turkey Point Nuclear Plant in southeastern Florida. The power plant contains a large

cooling canal system with warm water;which has salinities elevated above typical, natural surface water in southeastern Florida, circulating within the canals in the uppermost part the highly permeable karst carbonate Biscayne Aquifer. The salinity of the cooling water is greater than natural groundwater salinities in the area, and thus, the presence of unstable density-driven convection is possible.

51 removed

SALTWATER INTRUSION

52 ***USGS GROUND WATER ATLAS of the UNITED STATES Alabama, Florida, Georgia, South Carolina***
INT-047; SOP at 50

"SALTWATER ENCROACHMENT "The delicate natural balance between ***freshwater*** *and saltwater in the Biscayne aquifer is tipped* ***when canals and well fields are superimposed on it.*** *Where a highly permeable aquifer, such as the Biscayne, is hydraulically connected to the ocean, inland movement of saltwater is offset by a slightly higher column of freshwater. Because freshwater is lighter than saltwater, a 41-foot column of freshwater is necessary to balance a 40-foot column of saltwater. This means that,* ***for each foot of freshwater above sea lev el, there is approximately a 40-foot column of fresh water below sea level.*** *Accordingly, lowering of freshwa-ter levels by drainage canals or by intensive pumping creates an imbalance that causes the inland movement of saltwater."*

53 ***Water, Water, Everywhere: Sea Level Rise in Miami*** *INT-013, at 7; CASE SOP, at 15*

The wedge of salt water advances and retreats naturally during the dry and rainy seasons, but ***the combination of fresh water extraction and sea level rise is drawing that wedge closer to land laterally and vertically.***

SALTWATER INTRUSION (CONTINUED)

54 **CASE SOP, at 28-29, (INT-016) LETTER FEBRUARY 1, 2014 DERM TO FDEP**

RER Application to Renew Turkey Point Industrial Wastewater Facility (CCS) Permit Number Fzl0001582

The application asserts that the facility is a ***"zero discharge facility"*** *and that there are* ***no discharges to the surface waters beyond the Cooling Canal System (CCS). This is contrary to recent findings*** *of the interagency team from the SFWMD, DEP and DERM that has been reviewing discharges from this wastewater treatment system….water from the CCS is affecting fresh groundwater west of the G III groundwater boundary. The data also indicate the* ***potential for surface waters*** *impacts at least partially through interaction between this* ***groundwater plum and the nearby canal systems****. This include(s)* ***the L-31E canal….*** *Although the current FDEP monitoring (under the existing permit) is apparently* ***not designed*** *to detect impacts beyond the wastewater treatment facility,* ***it does indicate a*** *continuing deterioration of water quality within the cooling canal* ***system.*** *… This continued*

deterioration of water quality over the life of the wastewater treatment system is also ***evident*** *in groundwater data reported to the SFWMD from FPL's monitoring well network, which extends* ***several miles to the west*** *(upgradient)* ***of the CCS*** *…Based on the long term trend in these data it* ***does not appear that operation of this wastewater*** *treatment facility (CCS) is sustainable without changes. …. monitoring should be required for all constituents that leave the CCS including monitoring of the thermal plume.*

SALTWATER INTRUSION (CONTINUED)

PETITION, at 18-19

Salt Water Intrusion

55 *In 2013 the U.S.Geological Survey published Saltwater Intrusion in the Surficial Aquifer System of the Big Cypress Basin, Southwest Florida, and a Proposed Plan for Improved Salinity Monitoring*
http://pubs.usgs.gov/of/2013/1088/

The abstract states, in part,

55A *The installation of drainage canals, poorly cased wells, and water-supply withdrawals have led to saltwater intrusion in the primary water-use aquifers in southwest Florida. Increasing population and water use have exacerbated this problem. Installation of water-control structures, well-plugging projects, and regulation of water use have slowed saltwater intrusion, but the chloride concentration of samples from some of the monitoring wells in this area indicates that saltwater intrusion continues to occur. In addition, rising sea level could increase*

the rate and extent of saltwater intrusion. (emphasis added).

55B *Beginning in the early 1940s, USGS studies conducted in south Florida identified the following causes of saltwater intrusion: (1) lateral encroachment of saltwater along the base of aquifers caused by reductions in freshwater head by 18 water-supply withdrawals or canal drainage. ...Sea-level rise may exacerbate saltwater intrusion by increasing saltwater encroachment along the base of the aquifer as a result of a decrease in freshwater head relative to sea level or enhanced leakage of saltwater from surface-water features.*

Thus, this report relates freshwater to saltwater intrusion and excessive

MIGRATION
IMPACT ON MARINE LIFE

INT-076 - CASE REBUTTAL DEC 1, 2016, REDLINED, at 6-11.
SWORN TESTIMONY DR PHILIP K STODDARD

AQUATIC RESOURCES

CASE REBUTTAL DEC 1, 2016, REDLINED, at 6-11. (INT-076)
56 **SWORN TESTIMONY DR PHILIP K STODDARD**

The NCR Environmental Assessment And Final Finding Of No Significant Impact misses several effects of allowing an increase in the peak temperature of the Cooling Canal System (CCS or ultimate heatsink) from 100° to 104°F (37.8° to 40°C).

"Let's consider this statement in the 2014 Assessment in the section "Aquatic Resources": "The CCS supports a variety of aquatic species typical of shallow, subtropical waters, including phytoplankton, zooplankton, marine algae, rooted plants, crabs, and estuarine fish. Because of high water temperatures and salinity content of the CCS,

the resident fish assemblage is dominated by species adapted to living in harsh conditions, such as sheepshead minnow (Cyprinodon variegatus) and several Fundulus species."
The highest known spawning temperatures for any ray-finned fish is 93°F (34°C) for Cyprinodon nevadensis (Shrode & Kerking 1997). Short term exposure (hours) to 34°C reduces survival egg survival by 50% in Cyprinodon macularis (Kinne & Kinne 1962). Local species of Cyprinodon and Fundulus, while relatively heat-tolerant, are unlikely to match the desert species Cyprinodon nevadensis for heat tolerance. Gametogenesis in all animals (except birds) is disrupted at temperatures exceeding 95°F 6 35°C) (Kim et al. 2013, Moatani & Wainright 2015). The increase in allowable peak temperature signifies a concomitant increase in the time that the water temperatures will exceed the maximum temperature for fish reproduction. Thus, even if the fish and invertebrates residing in the canals are able to survive for the duration of elevated water temperatures, their reproduction is inhibited, and thus populations will diminish.

57 *The "Aquatic Resources" section continues:*

The CCS is owner-controlled and closed to the public; thus, fish and other aquatic biota in the CCS do not carry any commercial or recreational value." While this statement is true, it ignores the important biological value of these fish and aquatic biota in the food chain for mobile piscivorous predators that have resided in and foraged in the CCS since it was created, including American crocodiles, wading birds, terns, etc. Likewise the statement ignores the threatened status of the American crocodile which constitutes "other aquatic biota" of considerable value.
Mazzotti (1983) reported that American Crocodiles seek temperatures just below 86°F (30°C) and show signs of physiological stress exceed 100°F (38°C). Nile crocodiles die at temperatures approaching 104°F (40°C) (Hutton and Brennan 1985 in Hutton and Child 1989).
Adult American crocodiles can survive in hypersaline water up to 80 ppm (Inchautegui et al. in Thorbjarnarson 1989), but juveniles cannot

survive above 43 ppt (Carney in Thorbjarnarson 1989, Gaby et al. 1981). Juveniles do not perform well in hypersaline environments (Mazzotti 1983) and avoid such conditions in nature, preferring salinities in the range of 0-20 ppt (Cherkiss et al. 2011).

The section of the Assessment on "CCS Chemical Treatments" states: "Regarding crocodiles, the NRC's July 25, 2014, biological assessment notes that FPL has not observed any behavioral or distributional changes or any other noticeable differences that would indicate effects on crocodiles resulting from either the presence of higher algae concentrations or the recent chemical treatments."

In considering crocodile welfare, the NRC ignores the questions of salinity and temperature on the crocodiles. According to FPL, the crocodile population at Turkey Point crashed in 2015, with a 78% decline in the number of crocodile nests within the CCS, and a 90% decline in the number of tagged hatchlings.

The literature suggest that elevated temperatures in the CCS have produced thermal and hypersaline conditions that are hostile to American crocodiles and other aquatic vertebrates, and the recent population crash supports this conclusion. Thus, granting permission to exceed water temperatures of 100°F (37.8° C) can only be seen as granting permission to eliminate American crocodiles and other fauna from the CSS.

57 *The Contention asks whether hypersaline water migrating out of the CSS could also have deleterious effects on Biscayne Bay.* ***Migration of*** *the hypersaline water through the porous oolitic limestone into the Bay is expected to create conditions shown above that are avoided by young crocodiles and are harmful to a variety of aquatic life.*

Likewise the Contention considers the ***consequences of pumping freshwater into the CCS to reduce its salinity.*** *FPL has argued that pumping water from the L-31E is needed when periods of low rainfall contribute to hypersalinity in the CCS. Those same periods of low rainfall are precisely when Biscayne Bay and the Southeast Coastal Everglade are in greatest need of freshwater delivery. Thus* ***FPL could not draw water from the L-31E at a worse time, or one likely to***

produce greater impact on the Bay and Southeast Coastal Everglades.

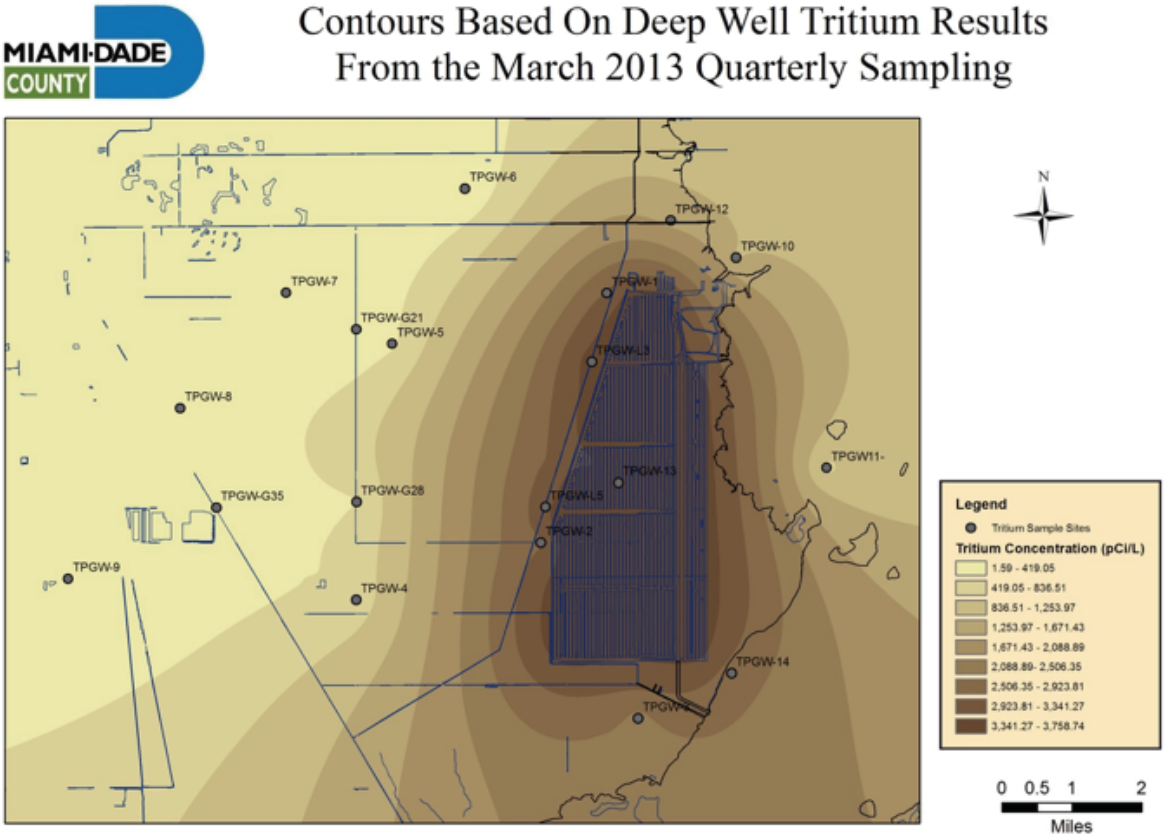
57A *The NRC predicts no deleterious effects from application of copper sulfate to control cyanobacteria ("blue-green algae) within the CCS. The report notes that most of the copper is adsorbed by the sediments.However the report also notes that sedimentation of the CCS is reducing flow, which could make it advantageous to dredge the sediments in the future. The report makes no mention of whether copper-bound sediments may be safely or legally relocated because of their potential toxicity.*

57B FPL's operation has created thermal and hypersaline conditions inside the CCS that are inhospitable to reproduction and survival of America crocodiles and other aquatic fauna. The proposed elevation of the permitted temperature limits from 100° to 104° effectively sanctions the elimination of crocodile reproduction within the CCS. Migration of hot, hypersaline water into the surrounding bay, and consumption of freshwater destined for the surrounding Coastal Everglades attempts to correct salinity problems in on FPL's site by relocating those problems from the CCS to the surrounding habitat on public lands and waters.

57B
CASE: Dr. Stoddard has enumerated the many undisclosed harms in the 2014 EA to flora and fauna not only from the proposed actions on the CCS but from what has accumulated from the past. Hypersaline water in a delicate wetland stresses all living things. Biologists should know this.

MIGRATION FROM THE CCS AS EVIDENCED BY THE

TRACER ISOTOPE TRITIUM



INT-062 (INT-002, Slide 10) Migration of water from the Turkey Point Cooling Canal System. Analysis by Miami-Dade County

INT-028 (TP 6& 7) DEIS Comment Submittal for Miami-Dade County, May 22,2015 ML15146118 (INT-028)

58 MDC (Miami-Dade County) strongly emphasizes that the state certification for the Units 6 & 7 project, issued on ***May 19, 2013,*** *was issued at a time when the impacts of the implementation of the Units 3 & 4 Uprate were not yet evident because some of the water quality monitoring data were either not yet available or had not yet been reviewed and analyzed. The most noteworthy issue to point out as it relates to the evaluation of the Units 6 & 7*

project's proposed RCW is the significant increase in the ***tritium*** *concentration at the deep well of monitoring well cluster* ***TPGW10, which is located on Biscayne Bay slightly north and east of the Turkey Point Plant and within the cone of influence of the*** *proposed RCW, see Figure 1. In September of 2012****, tritium was identified by DEP, the SFWMD and MDC as the tracer to delineate vertical and horizontal extent of the CCS hypersaline plume. The increase in tritium concentration at TPGW-10D first became evident in the quarterly monitoring results for the June 2012 sampling,*** *which coincides with the time that Unit 3 was being uprated and not all circulating pumps were operating, see Figure 2 attached. MDC believes that this is a significant finding because it appears to suggest that mobilization of the CCS hypersaline plume under the bay towards the area where the RCW are proposed to be installed may have been facilitated by the reduction in operation of the CCS* ***circulating pumps.*** *It is important to note the results of the aquifer performance test that FPL provided in support of the proposed radial collector wells. Although FPL did not provide the types of data that MDC requested, the limited data that was provided should be carefully reviewed. Most noteworthy are the* ***extremely high levels of sulfate*** *detected in the monitoring wells during the* ***test in addition to the elevated sulfate levels in the surface waters of Biscayne Bay.*** *These data suggest that the* ***highly contaminated water beneath the cooling canals was drawn into the surface waters of Biscayne Bay,*** *albeit with a much lower pumping volume during the test than would be realized when the radial collector wells are in operation.*

Determining whether operation of the radial collector wells, which would be the largest well field in Miami-Dade County in terms of daily pumped volumes, would result in ***violations of applicable water quality standards in the tidal waters of Biscayne Bay including Biscayne National Park*** *is necessary.*

CASE: Data from the USGS and DERM presented at paragraphs 49, 52, 54, 55A, 58 ,59 ,59a, 69 and 70 evidence that **water** from the CCS **migrates** into the Biscayne Aquifer, into Biscayne National Park and into the Biscayne Bay Estuary.

INCREASE IN GROUND AND SURFACE WATER TRITIUM EAST OF THE CCS

CASE SOP, at 38-40
Memo from DERM to SFWMD

59 From: Otero, Luis (RER) (DERM)
Sent: Wednesday, May 14, 2014 12:57 PM
To: Burns, Scott; Steve Krupa (skrupa@sfwmd.gov); Janzen, John
Cc: Grossenbacher, Craig (RER); Blair, Stephen (RER)
Subject: Uprate monitoring issues

…the data show some changes in the water quality of some monitoring stations and these changes appear to coincide with the period of time when Units 3 & 4 were undergoing their Uprate. Unit 3 was off-line to be uprated from February 26 to August 29, 2012 gradually brought back to full operating capacity by November 5, 2012. Unit 4 was off-line to be uprated from November 5, 2012 to April 6, 2013 gradually brought back to full operating capacity by May 27, 2013. ***Changes of particular note are the increase in tritium concentration in the groundwater at monitoring station TPGW10 (TPGW-10D in particular),*** CASE: Location described in citation immediately above) ***and the increase in TKN * in the surface waters of the CCS*** *(see graphs below). I plotted the groundwater levels of monitoring station TPGW-13 to see if these would provide any clues as to what happened to groundwater levels in the CCS during the Uprate period but unfortunately it appears that none of the water level sensors at TPGW-13 were working for a very long time (over 1 year), including during the Uprate period,… Were any of you aware that the water level monitoring at TPGW13 had been off line for this period.*

**TKN (Total Kjeldahl Nitrogen) is the total concentration of organic nitrogen and ammonia.*

GRAPHS in CASE SOP (INT-076), at 39,40

59A
CASE: Tritium levels went from near zero to 1200 from June/July 2010 to March 2013. Ammonia and **Surface Water TKN** increased seven fold at most of 13 wells. Note that DERM's distribution on this note only went to the SFWMD; no other agency was copied.
TPGW10 (TPGW-10D well is about one mile northeast of the CCS just off of the coast in Biscayne Bay.

100 MGD FROM THE L-31E CANAL AUTHORIZED BY SFWMD INT-042 (INT-001, AT 7)

SFWMD FINAL ORDER WITHDRAWALS FROM L-31E CANAL AUGUST 14, 2015

at 8,

60 *24. Pursuant to the limitation defined in the fall 2014 Emergency Order, FPL pumped a limited number of days and volumes. The **withdrawals**, when allowed, ranged from 1 to **103 million gallons per day (MGD)** of water, which equated to 3.69 to 3790.61 acre feet. FPL withdrew a total of 1,135 million gallons (MG) of water, which equated to approximately 4,163 acre feet*

at 6 of TETRA TECH ATTACHMENT

61 *The greatest decrease in average salinity occurs with the L-31E water added to the CCS is constrained only by the withdrawal pump capacity (maximum of 100 MGD)*

61A

CASE: The 2014 EA indicates withdrawals of 14 MGD. No mention is made of the possibility of the potential need for larger amounts.

WITHDRAWAL OF FRESHWATER

PETITION, at 16-17

62 Regarding water to be withdrawn from the (Biscayne) aquifer Biscayne National Park Superintendent Brian Carlstrom wrote to the SFWMD on August 29, 2014 (Petition, Exhibit 4, ML14296A290) expressing his concern about the source and amount of freshwater to be used to mitigate the CCS situation:

> *The proposed quantity of **freshwater** to be **withdrawn** has been characterized as being about the amount reserved (i.e. **"excess")** for the Biscayne Bay Coastal Wetlands (BBCW) Comprehensive Restoration Plan Project (CERP). … The amount of **freshwater** received in the wet season above Reservation amount is necessary to maintain the correct salinity balance into the beginning of (the)dry season within the (Biscayne National) Park and Biscayne Bay…. The proposed withdrawals from the L-31E Canal for the CCS for Turkey Point units 3 & 4 are withdrawals of water from the Regional System.*

FPL-001 WRITTEN TESTIMONY

63 C. Pete Andersen, at 18,

Q29. Are any of the water sources used by FPL in the CCS classified a "**freshwater**"?

*A29. (SS) Yes. The **excess** storm **water from the L-31E canal** contains agricultural and suburban runoff, but **can be classified as a freshwater** source due to the limited chloride content of the water. However, the SFWMD has approved the use of this **excess** storm water (emphasis added)*

63A
CASE: Note what Mr. Anderson described as ***excess* freshwater** is seen by Superintendent Carlstrom as ***essential* freshwater.** NEPA would call this an Unresolved Conflict Over Resources

Sec. 102 [42 USC § 4332] (1) (E). Also, Mr. Anderson describes the L-31E Canal water as freshwater where the 2014 EA, at xx, describes it as saltwater.

SALTWATER INTRUSION AS RELATED TO FRESHWATER WITHDRAWAL

64
Saltwater Intrusion of Coastal Aquifers in the U.S., James Spatatora, Johnson State College, Senior Seminar, May 6, 2008 (INT-041)
http://kanat.jsc.vsc.edu/student/spatafora/setup.htm

What is saltwater intrusion?

Salt water intrusion occurs in coastal freshwater aquifers when the different densities of both the saltwater and freshwater allow the ocean water to intrude into the freshwater aquifer. These areas are usually supporting large populations where the demanding groundwater **withdrawals f**rom these aquifers is **exceeding the recharge rate.** Figure 2 gives a rough illustration of what an overdrawn aquifer may look like. This can cause lateral and vertical intrusion of the surrounding saltwater, and evidence of saltwater intrusion has been found throughout the eastern seaboard of the U.S. (USGS, 2007). The encroaching seawater will encounter an area known as the zone of dispersion, where the freshwater and saltwater mix and form an interface, as illustrated in Figure 3. This interface moves back and forth naturally because of fluctuations in the recharge rate of freshwater back into these coastal aquifers (Ranjan, 2007). Aquifers are naturally replenished by precipitation and surface waters that saturate into the ground and work their way through the soil and geologic material to the water table.

65 What causes saltwater intrusion?

When groundwater levels in aquifers are depleted faster than they can recharge. This is directly related to the position of the interface and determines the amount of saltwater that can intrude into the freshwater aquifer system. Since saltwater intrusion is directly related to the recharge rate of the groundwater, this allows for other factors that may contribute to the encroachment of seawater into the freshwater aquifers. **Climatic variables, such as precipitation, surface runoff, and temperature can play a big role in affecting saltwater intrusion**. **With lower precipitation amounts and warmer temperatures, the recharge rate will be much less due to lack of groundwater present and increased evaporation** (Ranjan, 2007). Along with this, other factors may influence the groundwater recharge rate indirectly. An example of this would be the rising carbon dioxide emissions in the atmosphere. Increasing carbon dioxide levels can lead directly to an increase in average surface temperatures, indirectly increasing the evaporation rate and affecting the recharge of freshwater into the coastal aquifers. Figure 4 illustrates a situation where **major pumping of well water has lead to a cone of depression in the water table.** Figure 4 illustrates a situation where **major pumping of the well water has lead to a cone of depression in the water table. When this occurs, it will move the saltwater freshwater interface inland, resulting in a higher saline concentration in the aquifers' water, rendering it useless for human consumption, unless it is treated.**

65A DERM INTERNAL COMMUNICATION, August 29, 2014
copies sent to NRC and to FPL,
CASE SOP, (INT-018,) at 37

"*It has become clear that the Cooling Canal System (CCS) that provides cooling for FPL's Units 3 and 4* ***is damaging the ecological values in the South Dade Wetlands.*** *Operations at the Turkey Point power plant complex result in harvesting of water from the surrounding areas, including the* ***fresh water*** *in the South Dade Wetlands, to provide make-up water for the CCS. …"*

SALTWATER INTRUSION

Origins And Delineations of Saltwater Intrusion

(INT-045; INT-001, at 13-14)

66

"Intrusion of saltwater into parts of the shallow karst Biscayne aquifer is a major concern for the 2.5 million residents of Miami-Dade County that rely on this aquifer as their primary drinking water supply. Saltwater intrusion of this aquifer began when the Everglades were drained to provide dry land for urban development and agriculture. The reduction in water levels caused by this drainage, combined with periodic droughts, allowed saltwater 13 to flow inland along the base of the aquifer and to seep directly into the aquifer from the canals."

66A *INT-001, at 6-7*

The wedge of salt water advances and retreats naturally during the dry and rainy seasons, but the combination of fresh water extraction and sea level rise is drawing that wedge closer to land laterally and vertically. In other words, the water table rises as sea level rises, so with higher sea level, the saltwater exerts more pressure on the fresh water in the aquifer, shoving the fresh water further away from the coast and upward toward the surface.

SALTWATER INTRUSION, CONTINUED,

PETITION, at 6

67 *In January, 2013 the U.S.Department of the Interior published its Annual Report on Technology Transfer FY 2012. It includes the*

following information:

*In **2010**, the USGS Fort Lauderdale Water Science Center entered into a Technical Assistance Agreement (TAA) with Florida Power & Light Company (FPL) to collaborate on **a study of salinity intrusion into groundwater at FPL's Turkey Point Nuclear Plant in southeastern Florida. This power plant uses a recirculating cooling system. The salinity of the cooling water is greater than natural groundwater salinities in the highly permeable carbonate Biscayne aquifer located in the area. Aquifers in terrain with landforms and hydrology created from the dissolution of soluble rocks, also known as karst aquifers, are highly vulnerable to contamination due to the hydrogeology of the landscape. In the U.S., about 40% of the groundwater used for drinking comes from such aquifers. (emphasis added)***

MIGRATION FROM THE CCS

67A
USGS Origins and Delineation of Saltwater Intrusion in the Biscayne Aquifer and Changes in the Distribution of Saltwater in Miami-Dade County, Florida - 2014
Prepared in cooperation with Miami-Dade County (NRC-036)

CASE: USGS Origins etc, Illustration 3, in CASE SOP, INT-000, page 12, (Scientific Investigations Report 2014-5025) shows how **salt laden water from the CCS descends from each furrow in the CCS to bottom of the Biscayne Aquifer about 90 feet below and spreads in all directions.**

TRITIUM AS A TRACER

USGS Origins (NRC-036; Int-001, at 9-16))

Turkey Point Nuclear Power Plant Cooling Canal System

68

The cooling canal system (CCS) of the Turkey Point Nuclear Power Plant east of Florida City (fig. 8) was constructed during the early 1970s and contains hypersaline water (Janzen and Krupa, 2011). This hypersaline water may be contributing to saltwater encroachment in this area (Hughes and others, 2010). Water in the cooling canals is reported to have tritium "concentrations at least two orders of magnitude above surrounding surface and groundwater and [tritium] therefore [is] considered a potential tracer of waters from the CCS" (Janzen and Krupa, 2011, section 2, p. 8). ***The tritium concentration of samples collected from sites located within 8.5 km of the CCS ranged from 4.1 to 53.3 TU and averaged 12.4 TU, whereas the tritium concentration of samples collected farther away from the CCS averaged 1.3 TU*** *(appendix 2, table 2–3) (see the Tritium and Uranium Concentration section of this report).* ***Saltwater intrusion is a recent occurrence at most of the groundwater monitoring wells (***figs. 18, 19, 21–26) ***within 8.5 km of the CCS, except at wells FKS4 and FKS8 near the Card Sound Road Canal*** (see the Card Sound Road Cana section of this report)***.*** *No samples were collected from the CCS or wells within it as part of the current study to detect any possible influxes of CCS water into* ***t****he aquifer; however, monitoring wells were installed in 2010 adjacent to the CCS for other studies and* ***these wells are being monitored using electromagnetic induction groundwater logging.***

The Summary and Conclusions state:

69 ***TRITIUM***

The highest tritium concentrations (3.2 to 53.3 TU) measured during the study were measured in water from wells FKS4, FKS7, G–1264, G–3698, G–3699, G–3855, and G–3856. These seven wells are within 10 km of the Turkey Point Nuclear Power Plant, and hypersaline water with high tritium concentrations from the cooling canals may be contributing to saltwater encroachment near the wells. *Geochemical analyses and long-term monitoring*

data from wells G–1264, G–3698, G–3699, G–3855, and G–3856 confirmed the recent arrival of saltwater intrusion.

70

CASE: 2011 and **2013** analysis by DERM of FPL CCS data **show tritium two miles to the east of the CCS at:**

(INT-002, *Units 3 & 4 Uprate Implementation Water Quality Impacts,* Slides 8 and 10 (Slide 10 also in CASE SOP, INT-000, Page 10) *Contours Based on Deep Well **Tritium** Results from June 2011/March 2013 Quarterly Sampling.*

PERMEABILITY OF THE SOUTH FLORIDA AQUIFER

71 **MIGRATION STUDY:**

McNeill, Donald F., 2000. A Review of Upward Migration of Effluent Related to Subsurface Injection at Miami-Dade Water and Sewer South District Plant. Prepared for Sierra Club - Miami Group. 30 p. (INT-046 (INT-001), at 17)

*…at south (Miami-Dade County water) treatment plant … the presumed very thick low permeability zone (between the Floridan Aquifer and the Boulder Zone) was in fact **only about 14 feet i**n thickness and lay just above the Boulder zone at a depth of 2,456'-1,443' depth. Ten of the deep injection well(s) for the effluent came out above the low permeability zone. …the depth difference between Turkey Point and Black Point, (has) low permeability surface rises up to the northwest. **Effluent injected at Turkey Point will flow up the surface's gradient to the NW and then probably N. (It) will have lots of opportunities to encounter breaks in the permeability barrier in this lateral travel.***

***TRANSCRIPT** January 11, 2016,*
72 Mr. Anderson, FPL Staff

at 434,

1 MR. ANDERSEN: Yes. I agree with
2 everything Bill is saying. In addition, too, that
3 ***there is an upward hydraulic gradient from the***
4 Floridan to the Biscayne. The Floridan is under
5 pressure. Therefore, you have flow from the Floridan
6 into the Biscayne and not vice-versa.
7 CHAIR GIBSON: Okay.
8 MR. BOLLETER: Well, and also just adding
9 on, furthermore, there is water quality data from the
10 ***Floridan Aquifer*** *that it is not -- I mean* ***it is***
11 brackish water. It is low salinity.
12 CHAIR GIBSON: Correct. Well, I just
13 wanted to make sure I understand what the source of
14 the information was, that's all. But thank you.
15 MR. FORD: And I have one correction.
16 CHAIR GIBSON: Okay.
17 MR. FORD: Well, based on my
18 interpretation that if they were connected, ***the heads***
19 might drive the Floridan water upward into the
20 Biscayne but they are not hydrologically connected.

CASE: The two citations above indicate the **permeability of the confining layer is less than perfect.** The entire 4,000 square mile South Florida Aquifer is porous and interconnected. Eventually, water flows everywhere and the eco system is an interconnected, flowing mass. The CCS impacts all of it.

CYANOBACTERIA

2014 EA, at 13,14

73 CCS Chemical Treatments:

In 2011, FPL began to notice increased blue green algae

(cyanobacteria) concentrations in the CCS. The concentrations have steadily increased since that time. FPL has performed engineering and environmental analyses and believes that the presence of higher than normal CCS algae concentrations may be diminishing the CCS's heat transfer capabilities. FPL developed a plan to gradually reduce algae concentrations through controlled chemical treatment of the CCS over the course of several weeks.

On June 18, 2014, FPL submitted a request to the FDEP to approve the use of ***copper sulfate,*** *hydrogen peroxide, and a bio-stimulant to treat the algae*

- 14-

(letter contained in Appendix A of ADAMS Accession No. ML 14206A806). On June 27, 2014, the FDEP approved FPL's treatment plan for a 90-day trial period (letter contained in Appendix A of ADAMS Accession No. ML 14206A806). The FDEP requested that during the 90-day treatment period, FPL monitor the CCS for total recoverable copper and dissolved oxygen and submit its results to the FDEP. The FDEP also recommended that FPL coordinate with the Florida Fish and Wildlife Conservation Commission (FWC) due to the presence of crocodiles in the cooling system. The FWC provided its comments on FPL's treatment plan in a letter dated July 1, 2014 (letter contained in Appendix A of ADAMS Accession No. ML 14206A806).

The CCS chemical treatments have the potential to contribute to cumulative effects on CCS surface water resources, CCS aquatic resources, and the American crocodile*. Because the CCS is a manmade closed cycle cooling system, treatment of the CCS is not likely to have a*

significant cumulative effect on surface water resources. Monitoring required by the FDEP will
ensure adequate water quality throughout and following treatment. Monitoring will also ensure
that any unanticipated effects on the aquatic organisms that inhabit the CCS are appropriately
addressed. During the treatment period, FPL has agreed to report any potentially related fish
kills in the CCS to the FWC. ***No fish kills have been reported to date.*** *Regarding crocodiles, the*
NRC's July 25, 2014, biological assessment notes that FPL has not observed any behavioral or
distributional changes or any other noticeable differences that would indicate effects to
crocodiles resulting from either the presence o

74
TRANSCRIPT, January 11, 2016, at 501-502

16 MR. SCROGGS: Yes and no. In the summer
17 of 2013 and '14 we had a cyanobacteria, which is a
18 blue green algae, that was ***very aggressive*** *and high*
19 salinity supported blue green algae. As we have
20 reduced the salinity, we have seen a significant shift
21 in the population away from that blue green algae but
22 another algae has started growing. And the core issue
23 is there are nutrient levels in the system because of
24 all the vegetation surrounding it and that is what is
25 keeping the algae going and that is our longer term
502
1 challenge. (emphasis added)

CASE: Several issues come together here. Copper Sulfate, a toxic metal, is being used to try to control blue green algae, a potentially toxic cyanobacteria. Salinity has reached 100 ppt; nothing can live in that. This is all in a background to an exigent situation, although the EA does not mention that. Extraordinary biological processes have led to a situation which could shut down the reactors and destroy all life in the CCS. With all of this, the EA Staff deferred to past studies to address the current situation and allowed for no follow up to determine how things turn out.

CONCLUSIONS OF LAW

BOARD ORDER, March 23, 2015,

at 10-12,

75 *CASE argues that its members' injuries have been caused by the NRC's issuance of license amendments to FPL, because those amendments allow continued operation of FPL's "Turkey Point cooling canal system (CCS) at its current extreme levels of temperatures and salinity and increased use of freshwater resources [that] is a threat to the financial and ecological viability of the area."54 Additionally, CASE*

alleges "that the corrective actions taken to mitigate the situation were caustic and not exhaustively evaluated experimentally."55 While the NRC did not authorize any aquifer withdrawals per se, the NRC's approval of the present amendments enables Turkey Point Units 3 and 4 to continue operating at the same power level and with elevated CCS temperatures, which could effectively require additional aquifer withdrawals and lead to additional saltwater intrusion in the future. After all, absent NRC action, FPL would have been forced to shut down or at least reduce power at Turkey Point Units 3 and 4, a result that could have potentially obviated any need for more extensive aquifer withdrawals, at least during periods when CCS intake temperatures exceed 100°F

As to whether this proceeding could afford CASE's members a potential remedy, CASE alleges "that the NRC by its own regulations does have the authority to temporarily and permanently correct this situation in these proceedings We agree, and are not convinced by the assertion from the NRC Staff and FPL that this proceeding presents no opportunity to redress CASE's members' claimed injury. Standing law does not require that a possible remedy make a claimant whole by completely resolving an alleged injury. Rather, the United States Supreme Court has made clear that a remedy that makes even a small contribution to resolving a larger, more complex injury can still support a standing claim. As CASE states in its reply, the claimed injury could have been prevented through a variety of means, including "shutting down or reducing the operation of one or both reactors."58 The issue before this Board is not whether it may order the shutdown of Turkey Point Units 3 and 4, but rather, whether the NRC Staff is obligated to

evaluate more fully the environmental impacts associated with issuance of
the challenged license amendments, including the impact of aquifer withdrawals that are the
immediate or reasonably foreseeable result of the NRC's granting of the subject amendments.

76 § 51.20 Criteria for and identification of licensing and regulatory actions **requiring environmental impact statements.**
(a) Licensing and regulatory actions requiring an environmental impact statement shall meet at least one of the following criteria:
(1) The proposed action is a major Federal action significantly affecting the quality of the human environment.
(2) The proposed action involves a matter which the Commission, in the exercise of its discretion, has determined should be covered by an environmental impact statement.
(b) The following types of actions require an environmental impact statement or a supplement to an environmental impact statement:

77 (14) Any other action which the Commission determines is a major Commission action significantly affecting the quality of the human environment. As provided in§ 51.22(b), the Commission may, in special circumstances, prepare an environmental impact statement on an action covered by a categorical exclusion.

BOARD ORDER, March 23, 2015

at 16-17,

78 Ultimately, however, both the NRC Staff and FPL acknowledge that

the crux of CASE's concern is that the NRC failed to comply with NEPA in its evaluation of FPL's license amendment request … The Board disagrees with the NRC Staff's and FPL's characterization of Contention 1 as a direct challenge to the 2012 EPU license amendments. It is the Board's view that CASE refers to the uprate in order to highlight the alleged failure, by NRC Staff, to question FPL's claim that increased CCS temperatures have been caused by "unseasonably dry weather and . . . reduced cooling efficiency caused by an algae bloom."82 CASE maintains that the **NRC Staff should have considered the uprate of Turkey Point Units 3 and 4 as a potential cause of the temperature increase** necessitating the subject amendments.83 As CASE stated, "we're not challenging the up-rate. What we're saying is, you must look at the consequences and what it's causing, what's happening." (emphasis added)

79 NOTICE OF VIOLATION (INT-005(/CONSENT DECREE (INT-006) ISSUED BY MIAMI-DADE COUNTY DERM TO FPL

October 6, 2015
From: Barbara Brown, Code Enforcement Officer, Miami-Dade County, Florida
To: Randall R LaBauve, NextEra Energy, *Juno Beach, Florida*
Eric E. Silagy, FPL, Juno Beach, Florida
Re: FPL Turkey Point power plant *facility located at, near or in the vicinity of 9700 SW 344 Street, Unincorporated, Miami-Dade County, Florida*
NOTICE OF VIOLATION AND ORDERS FOR CORRECTIVE ACTION

Dear Messrs. LaBauve and Silagy:

Miami-Dade County Department of Regulatory and Economic Resources, Division of Environmental Resources Management (DERM) has reviewed data submitter in monitoring reports related to the Florida Power & Light (FPL) power plant at Turkey Point.

This review revealed levels of chloride in samples collect from

groundwater monitoring wells, including but not limited toTPGWL3, TPGW-15, TP GW-1 AND TPGW-12. ***These wells are located outside of the FPL cooling canal system (CCS) and beyond the boundaries of the property.*** *The* ***chloride levels constitute violations of the water quality standards*** *in Section 24-42(4) of the Code of Miami-Dade County.*
In addition, ***these elevated chloride levels exceed the applicable clean-up target level*** *set forth in Section 24-44* ***and therefore constitute water pollution*** *as defined in Section 24-5. On September 26, 2012, the South Florida Water Management District* ***identified tritium as the trace for determining the presence of CCS water****.* ***A review of tritium data shows that the groundwater originating from the CCS has expanded beyond FPL property boundaries.*** *Based on the foregoing information,*

DERM maintains that ***hypersaline water attributable to FPL exists in the groundwater outside the CCS and outside the property boundaries.*** *(emphasis added) As the letter above states,* ***there can be no doubt that water from the CCS is migrating from it, and is polluting the***
Biscayne Aquifer. *Attachments 5 and 6 contain the full letter and the* ***Consent Agreement entered into by the parties (INT-006)****.* ***DERM Staff clearly sees that more than the temperatures within the CCS need to be monitored; so should have the NRC Staff.***

EMERGENCY/EXIGENT SITUATION

FPL Letter to NRC July 10, 2014 (FPL-008),

at 1:

80 Subject: License Amendment Request No.

231, Application to Revise Technical Specifications to Revise Ultimate Heat Sink Temperature Limit

81 *Pursuant to* ***10 CFR 50.90 and 10 CFR 50.91 (a)(5),*** *Florida Power &*
Light Company (FPL) hereby requests an amendment to the Technical Specifications (TS) for the Turkey Point Nuclear Plant (Turkey Point), Units 3 and 4 (emphasis added):

FPL LETTER JULY 17, 2014 TO THE NRC, (NRC-018)

82 at 1,

Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Renewed Facility Operating License Nos. DPR-31 and DPR-41
Subject: License Amendment Request No. 231, Application to Revise Ultimate Heat Sink Temperature Limit - Request for ***Emergency*** *Approval (emphasis added)*

In the referenced letter, Florida Power & Light Company (FPL) requested an amendment to the Technical Specifications (TS) for the Turkey Point Nuclear Plant (Turkey Point), Units 3 and 4 pursuant to 10 CFR 50.90 and 10 CFR 50.91(a)(5). This letter clarifies that the referenced application was not requested to be processed in accordance with the emergency provisions of 10 CFR 50.91(a)(5) at the time of submission. ***The cited reference to 10 CFR 50.91(a)(5) was an administrative oversight.*** *At this time however, FPL requests the referenced application be approved on an emergency basis.*

CASE CITATION:

83 **10 CFR 50.91 (a)(5:)** *Whenever an emergency situation*

exists, a licensee requesting an amendment ***must explain why this emergency situation occurred and why it could not avoid this situation, and the Commission will assess the licensee's reasons for failing to file an application sufficiently in advance of that event. (emphasis added0.***

84 ***MEMORANDUM AND ORDER***
(Granting CASE's Petition to Intervene), March 23, 2015, at 26,

The NRC Staff, in reviewing the present license amendments, did indeed find that (1) "exigent circumstances exist"; and (2) "the amendment involves no significant hazards considerations."129 (129 Amendment Notice, 79 Fed. Reg. at 47,690). In light of 10 C.F.R. § 50.91(a)(5), the "exigent circumstances" determination seems compelled by the fact that violation of the TS limit for the CCS, ***whatever the cause*** *of the temperature increase, requires a dual unit shutdown. And, the second finding – the "no significant hazards determination– may not be challenged before the Commission or a licensing board.130 (130 10 C.F.R. § 50.58(b)(6)) . (emphasis added)*

CASE: Although in the Amendment Notice referenced above mentions exigent circumstances, nowhere in the 2014 EA do the words emergency or exigent actually appear. If, as FPL asserts in the two letters cited above, the condition is an emergency situation then 10 CFR 50.91 (a)(5) would seem to apply and not 10 CFR 50.90. On July 17, 2014 FPL withdrew its errant reference to 10 CRS 50.91 in its July 10, 2014 letter, invoking 10 CFR 50.90 but continuing to declare an emergency which the latter regulation does not cover but the former does. The words emergency and exigent do not appear anywhere in the 2014 EA so the EA does not convey the true nature of the situation as described by FPL to the Board or to the Commission. This speaks to another inadequacy of the EA. The only emergency at hand is the

possibility of having to downrate or shut down one or both reactors which, as the citation from the 2014 EA above states, NRC regulations state may not be challenged in this matter so that does not and cannot constitute a recognizable or permissible emergency, whatever the cause. If the EA and FONSI is the official and final statement of the NRC
Staff on the matter, it should have been characterized correctly. Not doing so is an inadequacy.

85
10 CFR 50.91 (a)(5) : *The Commission expects its licensees to apply for license amendments in timely fashion. It will decline to dispense with notice and comment on the determination of no significant hazards consideration if it determines that the licensee has abused the emergency provision* ***by failing to make timely application for the amendment and thus itself creating the emergency****. Whenever an emergency situation exists, a licensee requesting an amendment must explain why this emergency situation occurred and why it could not avoid this situation, and the Commission will assess the licensee's reasons for failing to file an application sufficiently in advance of that event. (emphasis added).*

86
CASE:

3.0 Reason the Emergency Cannot be Avoided
The current condition of the Turkey Point CCS is a new condition that has not been experienced
before. FPL has taken prompt, preventative action to address the CCS water condition as discussed
above in Section 1.0, including the analyses to support increasing the ultimate heat sink temperature
limit.. Furthermore, strong electric demand due to high summer temperatures and humidity are

forecasted to continue. For these reasons, FPL requests the NRC staff to consider the reference
application on an emergency basis.

Turkey Point Units 3 and 4
Basis for Emergency
Concerning License Amendment Request No. 231
Application to Revise Ultimate Heat Sink Temperature Limit
1.0 Background
An algae bloom in the Turkey Point cooling canal system (CCS) has reached a level of cell
concentration that is reducing cooling efficiency. Along with reduced water levels due to lower than
normal rainfall, the CCS is experiencing cell concentrations of algae higher than previously
observed, as well as, occurring earlier in the year than previous blooms.
Turkey Point Technical Specification (TS) 3/4.7.4 Limiting Condition for Operation

NEPA REQUIREMENTS

87 CALVERT CLIFFS

INT-076 CASE INITIAL SOP REDLINED, AT 63-64,

Calvert Cliffs' established an agency's obligation to comply with NEPA to the fullest extent possible. The court was asked to review rules promulgated

by the Atomic Energy Act on NEPA implementation and noted that NEPA makes environmental protection a part of the mandate of every federal agency and department. Agencies are "not only permitted, but compelled to take environmental values into account. Perhaps the greatest importance of NEPA is to require [all] agencies to consider environmental issues just as they consider other matters within their mandates."

Calvert Cliffs' Coordinated Committee v. Atomic Energy Commission, 449 F .2d 1109 (D.C. Cir 1971), cert. denied, 404 U.S. 942 (1972)

88

The National Environmental Policy Act of 1969, as amended

Purpose

Sec. 2 [42 USC § 4321]. The purposes of this Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological

systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

Sec. 102 [42 USC § 4332]. The Congress authorizes and directs that, to the fullest extent possible:

(1)**the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall —**

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by title II of this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(**C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on --**
(i) the environmental impact of the proposed action,
(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review processes;
…
(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

The 2014 EA, at 19:

89 *Agencies and Persons Consulted*
On July 28, 2014, the NRC staff notified the Florida State official, Ms. Cindy Becker, ***Chief of Bureau of Radiation Control, of the Florida Department of***

Health, regarding the environmental impacts of the proposed action. The State official had no comments. (emphasis added)

90
NEPA: PURPOSE

Sec. 2 [42 USC § 4321]. … to promote efforts which will prevent or eliminate damage to the environment and biosphere

Testimony, January 11, 2016

Briana A. Grange. NRC Biologist.

at 403, lines 4-9

4 One thing we take a look at during NEPA
5 reviews is ***what is likely to happen, rather than***
6 looking at the worst case scenario. *We don't look*
7 whether the impacts of it operating at four degrees
8 higher for the rest of the operating license but what
9 do we think is reasonable to occur in the future.

CASE: The NEPA Purpose statement excerpt above, and the entire spirit and intent of NEPA, might demand a higher standard than the NRC staff indicates the followed in preparing the 2014 EA. And, assuming that they had defined all of the factors contributing to the aberrant conditions in July, 2014 might also

be short of the NEPA mark. These standards and criteria of staff analysis and prescription of policies are usually set by senior management; are there established guidelines for staff in these matters? Ms. Grange is most likely a competent and well qualified biologist but does that quality her and her fellow staff members to make important policy decisions of this type?

91

NEPA: HEALTH AND WELFARE OF MAN

Sec. 2 [42 USC § 4321]. The purposes of this Act are: (to) eliminate damage to the environment and biosphere and stimulate the health and welfare of man;

While FPL's letter of August 27, 2014 to the SFWMD did not mention

"*in order to protect the* ***public health, safety, and welfare*** *pursuant to Section 373.119(2), F.S.," (highlighted above) the SFWMD Board Order did as the above citation shows. FPL and the NRC staff did not see this as relevant in this action but people who live and work in the area, and who administer local policy, did. And, if that is true, it does add an additional dimension to the preparation of an EA; were public health, safety and welfare at risk? The SFWMD thought so; the NRC staff did not consider these concerns.*

NEPA REQUIREMENTS

INT-076 CASE SOP, at 65-72,

92
NEPA: CONSIDER ALTERNATIVE ACTIONS

NEPA states:
Sec. 102 [42 USC § 4332] (2):

" ***(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on --***
(iii) alternatives to the proposed action,

93 In FPL's letter to the NRC of July 17, 2014 raising the situation to an emergency we read:

"FPL requests a timely review of this application to avoid exceeding the current limit which would necessitate a dual unit shutdown which would impact ***grid reliability****" (emphasis added)*

The 2014 EA states,

94 *"Alternatives to the Proposed Action*

As an alternative to the proposed action, the NRC staff considered denial of the proposed license amendments (i.e., the "no-action" alternative). Denial of the application would result

in no change in current environmental conditions or impacts. However, denial would result in reduced operational flexibility and could require FPL to derate or shutdown Turkey Point if the UHS average supply water temperature approaches or exceeds the 100 °F TS limit. In its application, FPL states that loss of load and voltage control resulting from such a shut-down during periods of high summer demand could result in impacts to ***grid reliability."***

CALVERT CLIFFS

95

Regarding the possibility of shutting down one or both reactors, Calvert Cliffs (Calvert Cliffs' Coordinated Committee v. Atomic Energy Commission, 449 F.2d 1109 (D.C. Cir. 1971), cert. denied, 404 U.S. 942 (1972)) tells us:

> *Delay in the final operation of the facility may occur but is not a sufficient reason to reduce or eliminate consideration of environmental factors under NEPA.*
>
> *Some delay is inherent in NEPA compliance, but it is far more consistent with the purposes of the act to delay operation at a stage when real environmental protection may come about than at a stage where corrective action may be so costly as to be impossible.*

96

CASE:

The point is simple; modifying the operation of the reactors was not on the table; s Cliffs says it should have been. NEPA would require that it

should have been at least considered further than it was. Could there have been another source of the problems in the CCS. CASE's Petition (INT-038) presented several. Was FPL's assertion that lack of rain and high ambient temperature causing the problem the only explanation? Illustration 8, above, Salinity For CCS Surface Water, suggests that there might be some link to the uprate; the FPL data on which it is based was available to the NRC staff. Salinity increased markedly following the uprate of Units 3 & 4 (blue and red bars). Coincidence does not mean causality but it does indicate that some research should be done. An adequate EA would have posed the question. Were there alternative causes which would the require alternative action? NEPA expects the questions to be asked.

NEPA: LONG TERM PRODUCTIVITY/RESOURCES

Sec. 102 [42 USC § 4332] (1) (C)
(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

97 The excessive use of freshwater and the over commitment of that limited resource is threatening several major municipal and economic interests in the area. Saltwater intrusion is befouling the freshwater aquifer four miles inland to the west and Biscayne National Park and Biscayne Bay Estuary to the east of the CCS. The large orange and red circle in Illustration 2 is the freshwater well field for the Florida Keys Aqueduct Authority. The Keys stretch about 120 miles from this point and the population is about 90,000. If that freshwater source is compromised, desalinization could cost $100 million per year. Rock mining and

agricultural interests are also in harm's way from saltwater intrusion; rock mining must cease at 250 ppt and you cannot farm salted land. Fishing and tourism, the economic backbone of the area are at risk.

NEPA: Sec. 102 [42 USC § 4332] (1) (C) v.

98 The Congress authorizes and directs that, to the fullest extent possible:

…views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards,

CASE: There does not seem to be, as NEPA would require, an established, regular, automatic flow of information from State and local authorizes regarding significant administrative measures and issues regarding the operation of the plant and its impact on and interaction with the environment to the NRC Staff. It would appear that only the information of this type provided by the operator, FPL in this case, reaches the NRC Staff.

NEPA: UNRESOLVED CONFLICTS OVER RESOURCES

Sec. 102 [42 USC § 4332]. The Congress authorizes and directs that, to the fullest extent possible:

(1) **the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall —**

(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

99 § 51.22(b) (b) Except in special circumstances, as determined by the Commission upon its own initiative or upon request of any interested person, an environmental assessment or an environmental impact statement is not required for any action within a category of actions included in the list of categorical exclusions set out in paragraph (c) of this section. **Special circumstances** include the circumstance where the proposed action involves unresolved conflicts concerning alternative uses of available resources within the meaning of section 102(2)(E) of NEPA.

NEPA: MAJOR FEDERAL ACTIONS

100

From ML032450279 1-4 Environmental Review Guidance for Licensing Actions Associated with NMSS Programs Division of Waste Management Office of Nuclear Material Safety and Safeguards U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 :

Chapter 4

101

An EIS must be prepared for proposed actions that

Are major Federal actions significantly affecting the quality of the human environment (10 CFR 51.20(a)(1));

The NRC, as a matter of its discretion, has determined that an EIS should be prepared (10 CFR 51.20(a)(2)); or are of the type listed in 10 CFR 51.20 (b).

An EIS provides decision makers and the public with a de tailed and objective evaluation of significant environmental impacts, both beneficial and adverse, likely to result from a proposed action and reasonable alternatives. In contrast to the brief analysis in an EA, the EIS includes a more de tailed interdisciplinary review. The EIS provides sufficient evidence and analysis of impacts to support the final NRC action in the Record of Decision (ROD; Section 4.10).

102

CASE: One could make the case that the operation of the CCS has broad and deep impact on the lives and well being of one of the rarest environmental settings on the planet and the people who live near it and the businesses which depend on it. An EIS would have been and would not be out of order. In fact, it might have been the only proper course even though the situation has been temporarily mitigated with hundreds of millions of gallons of freshwater and saline water all of which was and is needed to stem saltwater intrusion and to maintain the water table.

NEPA: SEGMENTATION

SEGMENTATION

Source
http://westcoastactionalliance.org/wp-content/uploads/2015/05/E.-Veenendaal-NEPA-Segmentation.pdf

103
Improper Segmentation

(An) environmental analysis is intended to evaluate the entire scope of a single and complete project. However, when a federal action is divided and analyzed into smaller separate components it is known as "segmentation."[22] Since all projects must start and end somewhere, project components may have independent utility and can be considered individually under NEPA.[23] However, when an agency intentionally attempts to circumvent NEPA by dividing a federal action into smaller components in order to allow those smaller components to avoid studying the overall impacts of the single project then "improper segmentation" has occurred.[24] Thus, it is unlawful for agencies to evade their responsibilities under NEPA by artificially dividing a major federal action into smaller components, each without significant impact. To permit non-comprehensive consideration of a project divisible into smaller parts, each of which taken alone does not have a significant impact, but which taken as a whole has significant impact, would provide a clear loophole in NEPA.[25]

In order to provide additional clarity on the issue, the courts have developed a four-factor test to determine whether improper segmentation has occurred. These factors include whether the proposed segment: (1) has logical termini; (2) has substantial independent utility; (3) does not foreclose the opportunity to consider alternatives; and (4) does not irretrievably commit federal funds for closely related projects.[27] While all factors have a modest weight, the analysis of a projects independent utility is the primary focus and the key factor in deciding most improper segmentation cases.

104

First, the project must have a “Logical termini” for project development is defined as (1) rational end points for a transportation improvement, and (2) **rational end points for a review of the environmental impacts.**[28]

Second, independent utility is determined by whether a project segment had an independent function, even if a no other segment of a project was constructed. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility.[29] Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility. Simply, put when the segmented project has no independent jurisdiction, no life of its own, or is simply illogical when viewed in isolation, the segmentation will be held invalid."[30] Consequently, while all factors have a modest weight, the analysis of a projects independent utility is the primary focus and key factor of the most improper segmentation determinations.[31]

The final two factors **require that the project not foreclose the opportunity to consider alternatives** nor irretrievably commit federal funds for closely related projects.[32] These factors are intended to demonstrate that there is no clear nexus between the projects that would limit the federal government’s ability to properly scope[33] the project and evaluate other alternatives as required by NEPA and to protect federal

funds against the waste, fraud, or abuse.

105

CASE: It would seem that the highlighted statements above apply to the subject matter.

- **rational end points for a review of the environmental impacts.**[28]

- **require that the project not foreclose the opportunity to consider alternatives** 32 … to demonstrate that there is no clear nexus between the projects that would limit the federal government's ability ...evaluate other alternatives as required by NEPA

106 Applying these rules to the present inquiry, if CASE, has cited a proper reference, would, as **regards rational end points for a review of the environmental impacts,** seem to give the EA a failing mark since the impacts were not defined and pursued to their rational end points. At almost every turn, the NRC Staff never missed an opportunity to miss an opportunity. Relying on stale analysis and not treating an exigent and unusual environmental event as such, would seem to absent in this EA.

107 (**Requiring) that the project not foreclose the opportunity to consider alternatives** 32 … to demonstrate that there is no clear nexus between the projects that would limit the federal government's ability ...evaluate other alternatives as required by NEPA would seem also to be relevant. In this instance, did suggest considering alternatives, such as reducing the power of the reactors, but this argument was disallowed. (INT-000, CASE SOP at 65=68, redlined) If another application of this principle is possible and seen by more experienced eyes, then it would be to the good to note that. Here again, if the NRC staff had considered alternatives, both as to possible causes and possible remedies, we might not be having this discussion. In terms of future approaches to these procedures, perhaps having management review them with an eye to these considerations might be fruitful. Sometimes staff does need a road map and set of defined standards under which to operate. These are perspectives that come with experience and maturity.

[28] U.S. Dept. of Trans. Federal Highway Admin., NEPA and Transportation Decisions, available at http://environment.fhwa.dot.gov/projdev/tdmtermini.asp.

[32] Piedmont Heights Civic Club, Inc. v. Moreland, 637 F.2d 430 (5th Cir. 1981); Swain v. Brinegar, 542 F.2d 364 (7th Cir. 1976).

STATE ACTION: THE FUNCTIONAL DIVISION OF STATE AND NRC ADMINISTRATIVE AUTHORITY

CITATION: *Idaho v. ICC*, 35 F.3d 585, 595 (D.C. Cir. 1994).

FINDINGS:

108 *…the Commission correctly concluded that it lacked authority to grant the relief sought by the Coeur d'Alene Tribe; and although the Commission violated the Endangered Species Act, this violation was harmless because the Commission promised to evaluate the biological impact of any salvage activities before authorizing them.* ***The Commission failed, however, to take a hard look at the potential environmental consequences of salvage activity as required by the National Environmental Policy Act.***

109
Judge Gibson stated, (Tr 553, 3-12),

```
3 do you have the
4 Idaho vs. ICC citation? Could you put that up? I
5 would just like to make note of one of the things that
6 I would like to be addressed in the proposed findings
7 and conclusions and that is I would like for the
8 parties to address this issue insofar as reliance on
9 State action and whether that is a sufficient basis
10 for, under this case, at least, for relying on what
11 the state is doing to not address an issue or to
12 assume that it is going to be addressed properly.
```

110
CASE: The Idaho v ICC does make a strong case for the need for the NRC staff to take a hard look at local action. In this case it was action by a

petitioner rather than the State. If we extend the hard look requirement for the NRC Staff to proactively observe on a specific and on an on going basis how the State is exercising its NRC given franchise to oversee the impact of reactor operations on the environment this would be a major change in the NRC role as it has evolved. One could postulate removing the function from the State or, alternatively, monitoring more closely how the delegated functions are being performed, if they are being done proactively in a timely, effective and task oriented manner free of local political, economic, private or parochial concerns and influence. Also, where the State finds that an environmental problem could be related to the operation of a reactor, there should be a mechanism for the NRC and the State to address it jointly. This would require an active flow of information from the State regarding their supervision activities and a policy and procedural pronunciation by the NRC but might be required to remedy the situation described herein, at paragraphs 111 and 112.

BOARD ORDER, March 23, 2015

at 22 -23

111 To CASE, the NRC's failure to address matters related to saltwater intrusion appears to be an abdication of responsibility for environmental impacts associated with FPL's operation of the CCS. CASE's critique in this regard seems to be borne out by the NRC Staff's efforts to limit its responsibilities to radiological safety. Thus, at oral argument, counsel for the NRC Staff stated that "in terms of the staff being able to tell FPL that salinity is too high in the canal . . . that would be something that the State of Florida would have authority over, as long as that salinity was not impacting the operation of the reactor." 116 As if to emphasize this narrow view of its NEPA obligations, the state officer with whom the NRC Staff consulted was Cindy Becker, Chief of the Bureau of Radiation Control at the Florida Department of Health, who had no comments on environmental

impacts associated with the proposed action. 117 The Florida Department of Health's Bureau of Radiation Control is responsible for monitoring the radiological environment at Florida's nuclear power plants – not the increasing salinity or temperature of the CCS. Apparently, the NRC Staff made no attempt to consult with the Florida Department of Environmental Protection, which is the state agency that would be in the position to best comment upon environmental conditions in the CCS because it – and not the Department of Health's Bureau of Radiation Control – has primary responsibility for this issue.118 ***To this Board, it appears reasonable to ask whether the NRC Staff has fulfilled its NEPA obligation to take a hard look at environmental impacts associated with issuance of license amendments increasing the allowable temperature in the CCS.***

116 Tr. at 155

117 See Tr. at 204-06; 2014 EA, 79 Fed. Reg. at 44,469

118 See 2014 EA, 79 Fed. REg. at 44,466, 44,468

Foot note, page 22:

112

115 See Tr. at 77-78. According to CASE's representative, "a bifurcated system has evolved where FDEP has responsibility without authority, and the NRC has authority without responsibility. … But if it turns out that the problem is being caused by something in the reactors like the up-rate, [the FDEP] do[es]n't have the authority . . . . And the reverse, the NRC controls the reactor and they have delegated their authority to the DEP to look after how it affects the land and the people."

113

CASE: As cited above, at xxxx, the AEA of 1954 and its 1974 amendment place the responsibility "to ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment"

on the NRC. Delegation of functions to the State may have evolved over time, but, in the final analysis, the NRC is responsible for the entire operation and its consequences.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) ACTIONS AND RELATED JUDICIAL DECISIONS

The 2014 EA,

at 9,

114

> *The Florida Department of Environmental Protection (FDEP) has issued FPL a "No* Discharge" National Pollutant Discharge Elimination System (NPDES) permit (No. FL0001562) **to operate the CCS as an industrial wastewater facility.** Accordingly, **the CCS does not discharge directly to fresh or marine surface waters.**

114

> The proposed action would not require FPL to request modifications to the NPDES permit because the plant discharge limits would not change. Plant discharge limits are not intake-temperature limited; rather, they are a function of ***the quantity of heat rejected to the CCS during plant operation.***

116

CASE: Did the NRC actually know the temperature of water coming from the reactors into the CCS in July, 2014.? Did it send its on site representative over to check it out? Did the FDEP check it out? Does

the NRC responsibility begin at the intake and end at the outflow point?

at 19:

117 *Agencies and Persons Consulted*

> *On July 28, 2014, the NRC staff notified the Florida State official, Ms. Cindy Becker,* ***Chief of Bureau of Radiation Control, of the Florida Department of Health, regarding the environmental impacts of the proposed action. The State official had no comments. (emphasis added)***

118

CASE: THIS IS THE **ONLY** REFERENCE IN THE 2014 EA TO CONTACT WITH ANY AGENCY IN THE STATE OF FLORIDA, INCLUDING MIAMI DADE COUNTY, FROM JULY 10, 2014 TO AUGUST 14, 2014

FLORIDA DEP AO December 23, 2014 OGC No. 14-0741
INT-004, at 6; CASE SOP, at 31-32

119 *The* ***primary goal of the Management Plan shall be to reduce the hypersalinity of the CCS to abate westward movement*** *of CCS groundwater into class G-II(< 10,000 mg/L TDS) ground waters of the State.* ***This westward movement abatement shall be evidenced by decreasing salinity trends in the monitor wells*** *located adjacent to the CCS specifically those designated as TPGW-1, TPGW-2, TPGW-13, L-3 and L-5. (CASE NOTE: Map CASE SOP, at 10) For the purposes of this Order, the term 'abate' or 'abatement' means to reduce in amount, degree or intensity; lessen; diminish. To achieve this goal,* ***FPL shall reduce and maintain the average annual salinity of the CCS at a practical salinity of 34***

and monitor salinity trends in groundwater wells *a specified in Paragraph 37.f. below" (37.f concerns the placement and monitoring of a new well at SW 152 Ave to the west of the CCS within 180 days)*

Florida DOAH Recommended Order, February 15, 2015
Case No. 15-1746 Case No. 15-1747 (Provided by FPL February 17, 2015, per Board request) **FOR THE AO CITED ABOVE**

at 1,

120 STATEMENT OF THE ISSUE

The issue to be determined in this case is whether the Administrative Order issued by DEP on December 23, 2014, (INT-004, cited above) is a reasonable exercise of its enforcement authority.

at 29-31,

121 94. ***The AO is an unreasonable exercise of DEP's enforcement discretion*** *because the success criteria are inadequate to accomplish DEP's stated purposes as explained below.*

122 a. Maintaining Salinity at 34 PSU in the CCS

i. ***Requiring FPL to maintain salinity in the CCS at 34 PSU*** *is based on 34 PSU being the average salinity of Biscayne Bay. However, in the context of addressing existing harm to the Biscayne Aquifer, it* ***could be an unnecessary impediment.*** *It was not shown why it is important not to allow the water in the CCS to become fresher than Biscayne Bay.*
ii. ***The evidence presented shows that, the fresher the water***

in *the CCS, the greater would be the freshening of the Biscayne* ***Aquifer beneath and west of the CCS.*** *Perhaps FPL would be able to explain in the Salinity Management Plan why economic, technological, ecological, or other considerations support the reasonableness of going no fresher than 34 PSU. However this record does not show the reasonableness of restricting FPL's options in this manner. FPL should be free to consider and propose options to lower the salinity in the CCS even further if it is practicable and could achieve greater benefits.*

iii. Requiring salinity to be maintained at 34 PSU is also unreasonable because it forecloses all options that could achieve the goal of the AO to abate westward movement of CCS groundwater into Class G-II groundwater without lowering the salinity of CCS water or not lowering it as much. Respondents did not explain in the record why FPL should be foreclosed from considering any option that achieves the goal of reducing the westward movement of CCS groundwater.

123 b. Decreasing Salinity Trends in Nearby Wells

i. Another success criterion in the AO is for FPL to demonstrate "decreasing salinity trends" in four monitoring wells near the CCS, but the decreasing trend is not quantified.

ii. The wording in the AO allows for achievement of this success criterion even with decreasing trends that are smaller than was predicted by the computer modeling upon which DEP relied. If decreasing salinity trends in wells near the CCS are smaller, then there would likely be less slowing of the westward movement of the saline water interface than was predicted by the modeling, and one of DEP's stated purposes would be thwarted.

iii. In addition, by only using wells near the CCS, the AO allows for the possibility that salinity trends near the CCS decrease as predicted by the computer modeling, but the predicted benefits at distance do not occur.

124 c. FPL's Contribution to the Harm

In this proceeding, DEP never stated that it had made a determination that FPL should not be required to terminate its contribution to the westward movement of the saline water interface. Instead, DEP stated that FPL's contribution had not been determined. That was the reason given for the enforcement approach taken by DEP. However, the AO does not require FPL to determine its contribution.

95. ***All of the infirmities in the AO described above can be cured by*** *amending the AO to delete the proposed success criteria and require FPL to submit a Salinity Management Plan that includes an analysis of the factors contributing to the western movement of saltier groundwater and options that could eliminate the CCS's contribution. In this amended form, the AO would not be an enforcement instrument, but would achieve DEP's apparent intent to require further analysis of the problem and its solution.*

125

96. Petitioners' claim that DEP should take immediate enforcement action to stop FPL's current violations and prevent further harm is a claim that must be brought in a proceeding under section 403.412,

126

CASE: While one must applaud Judge Canter's strong action here, we know from our broader and deeper involvement with the problems and issues in the CCS that it will be hard for the FDEP to come up with an effective plan since they do not control enough of the operational elements involved. One reason is that they do not perform the detailed analysis which DERM does to define and understand what is going on even though they receive the same data from FPL as DERM; they do not look at it. It will be interesting to see how they respond unless the Florida Secretary of Agriculture rejects Judge Canter's Recommended Order.

CONCLUSIONS

127 The objective of this inquiry is to determine if the 2014 EA and FONSI for Florida Power & Light Company's ("FPL") LAR request for the Cooling Canal System at Turkey Point was adequate. Obversely, CASE sought to demonstrate its inadequacy, by exhaustively presenting matters not, or less than fully, considered and acts of omission, if you will, by the NRC Staff. Further, elements of law and the requirements of NEPA not fully observed have been highlighted. The only purpose for the technical and procedural information presented by CASE was to indicate, by example, what an adequate EA might have included. If, in the process, CASE has identified procedural, biological, administrative, or scientific matters which, if addressed, modified or redesigned, could improve the operation of the CCS and mitigate its impact on the environment outside of the CCS that is ancillary to the primary purpose of the inquiry .Given the determination of inadequacy, it is the duty and the obligation of this Board, on behalf of NEPA, to to suggest remedial action. The complex interaction between the Turkey Point CCS and the environment requires much more evaluation and analysis than we see in the 2014 EA and FONSI.

RECOMMENDATIONS

128 Based on the foregoing Findings of Fact and Conclusions of Law this Board recommends that the Division of Operating Reactor Licensing Office of the NRC, within 60 days of the signing of this Order, restart the NEPA process to review FPL's LAR and all mitigative taken since July, 2014. The Licensing Office is to determine, as if from the beginning, if an EA or an EIS is required, why and on what terms, and to begin the selected form of inquiry.

129 The NRC Staff must no longer consider, and should discourage, conclusions drawn by FPL, or any other entity which the NRC regulates, in their submissions to the NRC. It is up to the NRC Staff to independently decide if an EA or an EIS is required and if a finding of no significant impact is merited. A regulation with which the utility is attempting to comply can be referenced but whether or not it has actually complied with is a judgement left to the NRC. All statements by the licensee or applicant which conclude that regulations have been met or that a given set of circumstances led to or would lead to, a particular result or situation should be independently evaluated by the NRC Staff. The licensees or applicant should simply present the information regarding the matter at hand to the NRC Staff for its evaluation. The NRC is ultimately responsible for the operation of the reactors and for their environmental impact.

130 The net result of CASE's petition should be to improve and remedy not only this particular action, but, hopefully, to affect good administrative practices and to access all necessary intellectual and professional resources as required at all levels. The NRC must make the process more proactively sensitive to the aspirations of NEPA and the demands of and impacts on the precious natural and human environment of the complex operation of a nuclear power plant.

Executed in Accord with 10 CFR § 2.304(d).

Respectfully submitted,

/S/ (Electronically) Barry J. White

Barry J. White
Authorized Representative
Citizens Allied for Safe Energy, Inc.
10001 SW 129 Terrace'
Miami, FL 33176
305-251-1960
bwtamia@bellsouth.net

Dated at Miami, Florida
this 28th day of March,

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
FLORIDA POWER & LIGHT COMPANY	)	Docket Nos. 50-250-LA
	)	and 50-251-LA
	)	
(Turkey Point Nuclear Generating)	)	ASLBP No. 15-935-02-LA-BD01
Units 3 & 4))		

CERTIFICATE OF SERVICE

I, Barry J. White, hereby certify that copies of the foregoing CITIZENS ALLIED FOR SAFE ENERGY PROPOSED FINDINGS OF FACTS AND CONCLUSIONS OF LAW have been submitted to the Electronic Exchange.

Executed in Accord with 10 CFR § 2.304(d).

Respectfully submitted,

/S/ (Electronically) Barry J. White

Barry J. White
Authorized Representative
Citizens Allied for Safe Energy, Inc.
10001 SW 129 Terrace'
Miami, FL 33176
305-251-1960
bwtamia@bellsouth.net

Dated at Miami, Florida
this 28th of March, 2016