

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:  
E. Roy Hawkens, Chairman  
Dr. Michael F. Kennedy  
Dr. William C. Burnett

In the Matter of	)	
	)	
FLORIDA POWER & LIGHT COMPANY	)	
	)	Docket Nos. 52-040-COL
	)	and 52-041-COL
Turkey Point Units 6 and 7	)	
	)	
Combined License Application	)	

April 18, 2011

AMENDED CONTENTIONS 1,2 AND 5.

INTRODUCTION

Events following the earthquake and tsunami on March 11, 2011 which crippled the six-reactor Fukushima Dai-ichi Nuclear Power Plant (NPP) complex on Japan's north-eastern coast have not followed predicted or anticipated parameters or patterns. Last month's earthquake and tsunami triggered left 13,228 people dead and 14,529 missing. More than 150,000 people have been made homeless. BBC News, April 12, 2011

The sporadic spikes of radiation levels on March 15 and 16, 2011 were seen at distances more than 12 miles from the site. The single event of radioactive iodine release on March 12 seems, however, to have found its way into the food chain. There is evidence that Evading safety requirements and measures were evaded or not implemented.. While the Fukushima NPP structures withstood the impact of a shock of 9.2 magnitude 130 km from the site, the 10 metre high tsunami waves — 2.5 metres above the safety margin provided — exposed the ill-preparedness of the operator, the Tokyo Electric Power Company (TEPCO).

A former Vice-Chairman of Japan's Nuclear Safety Commission, Kenji Sumita, wrote: "Every step TEPCO has taken is a day late and a dollar short. The release of information from TEPCO is even further behind."

Beyond the current number of known dead at Fukushima, one can look

ahead in time as in the following report: [Food and water poisoned by Japanese nuclear leak as expert warns more could die than in Chernobyl](#), Mirror, March 20, 2011:

"... One expert predicted that the death toll in the years ahead could top the 500,000 attributed to the Chernobyl accident of 1986 and warned that panicked repair attempts could lead to an even greater disaster. John Large, a British nuclear engineer, said: "The Japanese don't know how to deal with it. They're ad-libbing.

"Just throwing water on to the reactors, when they cannot get inside to see what the situation is, could mean the fuel goes critical again.

"And while the radiation leak so far is only a tenth of that at Chernobyl, that was in a rural area with a low population. In Japan it's an urban, densely packed area so the potential numbers of deaths and cancers are much higher." ...

Many of CASE's positions and conclusions in its Revised Petition to Intervene (Aug 20, 2010) were forward looking and based on a hypothesis that the FPL COL's did not consider a sufficient range of potential situations or eventualities. Now, unfortunately, we have experienced a catastrophic natural and nuclear event at Fukushima which gives us an opportunity to compare what CASE held to be failures and omissions to actual experiences in Japan. By reviewing actual reports of the experiences, events and insights over the last 30 days, we might learn some lessons and have better information on which to base licensure, or denial of licensure, for Turkey Point 6 & 7 for FPL. It is still CASE's position that siting these new reactors at Turkey Point would not be in the public interest and that it is the worst possible place on the planet to place them as our amended discussions of three contentions will show.

**Contention 1 -- FAILURE AND OMISSION OF THE FPL COL  
FOR THE PROPOSED TURKEY POINT NUCLEAR REACTORS 6&7 TO PROVIDE  
FOR AN ADEQUATE PUBLIC SAFETY PLAN  
CONTENTION: ONE**

**CONTENTION: INADEQUATE PUBLIC SAFETY PLAN**

(i) The emergency plan on file with Miami-Dade County does **not** adequately protect public health of people in the Turkey Point Plume Exposure Zone following an accidental radiation release from FPL's nuclear reactor facilities at Turkey Point.

Emergency Communications section of the FPL COL application (Part 2 - F-2) enumerate the methods and equipment for communication during an emergency which would form the basis for implementation of the emergency plan on file -- however the COL fails to clarify which of these emergency communication systems would be functional in the event of a Station Black-Out (loss of power and power back-up) at the proposed reactor site.

**(ii) BASIS FOR CONTENTION**

The NRC requires the filer to coordinate with local government to adequately protect people in the case of radiation release in a General Emergency. Such coordination will require communication. The existing emergency plans on file with Miami-Dade County consists of (1) evacuation and emergency shelter plans, (2) shelter-in-place plans, (3) plans for radiation testing, and (4) treatment of people with potassium iodide (KI) to reduce the significant risk of thyroid cancer. None of these aspects of the emergency plan would be

adequate in the event of a significant accidental release of airborne radiation from nuclear reactors at Turkey Point in a General Emergency:

- 1. Evacuation plans are not adequate for timely evacuation of all the people who could be affected in an accidental radiation release.**
- 2. Evacuation screening and shelter provisions lack capacity for the number of people living in the evacuation zone.**
- 3. Potassium iodide (KI) cannot be delivered in a timely manner to provide best protection from thyroid cancer.**
- 4. Reactor design proposed for TPN 6 & 7 elevates risk of radiation release and makes effective evacuation and KI plans more critical.**
- 5. Station black-out is responsible for 50% of the total risk of a major reactor accident, and would also likely interfere with the communications from the reactor site.**
- 6. Calculations of possibility of radiological impact in guidance materials are incorrect and should not be used. (see attachment C1-Risk)**

**(iii) CONTENTION IS WITHIN SCOPE – NRC Regulations 10(CFR) § 50.47**

**Emergency plans states:** that a new license will not be issued unless the operator can show that all safety plans in place by local and state agencies are sufficient to provide for the safety of the public in the event of a radiological emergency:

***NRC Regulations 10(CFR) § 50.47***

*(a)(1)(i) Except as provided in paragraph (d) of this section, no initial*

*operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. No finding under this section is necessary for issuance of a renewed nuclear power reactor operating license.*

*(ii) No initial combined license under part 52 of this chapter will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. No finding under this section is necessary for issuance of a renewed combined license.*

*(iii) If an application for an early site permit under subpart A of part 52 of this chapter includes complete and integrated emergency plans under 10 CFR 52.17(b)(2)(ii), no early site permit will be issued unless a finding is made by the NRC that the emergency plans provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.*

*(iv) If an application for an early site permit proposes major features of the emergency plans under 10 CFR 52.17(b)(2)(i), no early site permit will be issued unless a finding is made by the NRC that the major features are acceptable in accordance with the applicable standards of 10 CFR 50.47 and 10 CFR part 50, appendix E, within the scope of emergency preparedness matters addressed in the major features.*

*(2) The NRC will base its finding on a review of the Federal Emergency Management Agency (FEMA) findings and determinations as to whether State and local emergency plans are adequate and whether there is reasonable assurance that they can be implemented, and on the NRC assessment as to whether the applicant's onsite emergency plans are adequate and whether there is reasonable assurance that they can be implemented. A FEMA finding will primarily be based on a review of the plans. Any other information already available to FEMA may be considered in assessing whether there is reasonable assurance that the plans can be implemented. In any NRC licensing proceeding, a FEMA finding will constitute a rebuttable presumption on questions of adequacy and implementation capability.*

#### **(iv) DEMONSTRATION THAT CONTENTION IS MATERIAL TO THE NRC DECISION**

The emergency plans in place in Miami-Dade County cannot be implemented in a timely manner because of logistic problems and thus are not adequate to protect public safety in the event of an emergency release of radiation.

Therefore the operator, FPL, has not satisfied the stipulations of NRC Regulations 10(CFR) § 50.47.

**(v) STATEMENT OF FACTS & EXPERT OPINIONS:**

**1. Evacuation plans are not adequate for timely evacuation of all the people who could be affected in an accidental radiation release.**

The evacuation routes include only three main roads: U.S. 1, Florida's Turnpike, and Krome Ave. Because the radiation plume may extend 50 miles (Ingestion Exposure Pathway EPZ) or more, people in the Florida Keys and throughout South Dade would further congest the evacuation routes. Even a moderate wind from the south would overtake people fleeing the evacuation area.

The Florida Department of Community Affairs states that up to 17 hours would be required to evacuate coastal areas of Miami-Dade County.

[http://www.dca.state.fl.us/fdcp/dcp/hazardmitigation/MapsProfiles/MiamiDade/Miami-DadeProfile\\_final.pdf](http://www.dca.state.fl.us/fdcp/dcp/hazardmitigation/MapsProfiles/MiamiDade/Miami-DadeProfile_final.pdf)

In only two hours, even the lightest breeze would push the radiation plume over residents attempting to evacuate the 10-mile EPZ.

Miami-Dade County explains nuclear emergency evacuation to parents:

*“Activation of your plan should begin as early as possible because of the time it takes for parents or guardians to respond to your facility to pick up*

*their children.”*

[http://www.miamidade.gov/oem/library/preparedness\\_planning\\_sheet.pdf](http://www.miamidade.gov/oem/library/preparedness_planning_sheet.pdf)

Thus, parents working outside the evacuation zone would have to drive back into the zone to retrieve their children, adding to traffic congestion and further delaying evacuation.

## **2. Evacuation screening and shelter provisions lack capacity for the number of people living in the evacuation zone.**

The Tamiami Park Emergency Reception Center (ERC) intended to hold evacuees in Miami-Dade County has a host capacity for 1000 evacuees and a reported usage capacity of 2450.

<http://www.floridadisaster.org/Response/engineers/documents/2008SESP/2008-SESP-AppxA/2008SESP-AppxA-Miami-Dade.pdf>

Thus, plans to evacuate people in the radiation plume could not accommodate 98% of residents in the 10-mile EPZ, approximately 126,000 people according to the year 2000 U.S. Census for the communities of Cutler Bay, Florida City, Goulds, Lakes by the Bay, Leisure City, Naranja, Princeton, South Miami Heights.

## **3. KI cannot be delivered in a timely manner to provide best protection from thyroid cancer.**

According to both the NRC and the World Health Organization, to achieve protection from atmospheric release of radioactive iodine (I-131), KI should be

ingested **prior** to encountering the radiation cloud. Quoting the NRC:

*“If radioactive iodine is taken into the body after consumption of potassium iodide, it will be rapidly excreted from the body.”*

<http://www.nrc.gov/about-nrc/emerg-preparedness/protect-public/potassium-iodide-use.html>

FPL explains:

*“If conditions warrant, the Florida Health Department will make potassium iodide available at the reception centers.”*

[http://www.fpl.com/environment/nuclear/pdf/turkey\\_point.pdf](http://www.fpl.com/environment/nuclear/pdf/turkey_point.pdf)

The Modesto Maidique campus of Florida International University, adjacent to the Tamiami Park Emergency Reception Center (ERC), houses the County’s emergency supply of potassium iodide (KI). This ERC is 20 miles from the 10-mile diameter emergency planning zone (EPZ).

In the event of an emergency radiation release, the time required to evacuate the 10-mile EPZ to the ERC at Tamiami Park (up to 17 hours) would be too great to prevent initial exposure to inhaled radioiodines. The county has no effective plan to transport KI from the FIU campus to residents who shelter-in-place in their houses or businesses prior to their exposure from a moving radiation cloud.

#### **4. Reactor design proposed for TPN 6 & 7 elevates risk of radiation release and makes effective evacuation and KI plans more critical.**

FPL proposes to build the untested Westinghouse AP1000 reactor design for TPN 6 & 7. Analysis of the AP1000 by nuclear engineer Arnie Gundersen has revealed an elevated likelihood of corrosion leakage in combination with a “chimney effect” in the containment housing that would rapidly vent radiation



into the atmosphere during a core meltdown. Thus, the needs for more effective plans for evacuation and KI distribution are more compelling for TPN 6 & 7 than for the existing TPN 3 & 4 reactors. [See Exhibit: Declaration of Arnie Gunderson August 13, 2010, Vogtle COL].

**(vi) FPL's application assumes that the current emergency plans in place with Miami-Dade County for TPN 3 & 4 is likewise sufficient for TPN 6 & 7. It is our contention that the current emergency plans are not adequate to protect public safety for the reasons stated above, and therefore the application should be rejected until plans are in place that are sufficient to assure the safety of the population at risk in a sudden emergency radiation release.**

The US Coast Guard, unlike some other emergency response jurisdictions offered the following statement that their ranks require the level of protection that CASE believes all the residents of the area deserve:

*Emergency Preparedness Manager  
Turkey Point Nuclear Plant  
9760 SW 344 Street.  
Florida City, FL 33035  
Attn: Larry Hardin*

*Dear Sir,*

*The following information is provided in response to your email request on August 28, 2008, in which you requested the United States Coast Guard provide a new letter of support indicating our ability to meet the requirements of your Radiological Emergency Plan. This letter provides current resource and support capabilities for Coast Guard assets located in the vicinity of the Florida City Turkey Point Nuclear Plant. Please note that any emergency assistance that the Coast Guard may provide would be limited by the fact that Coast Guard crews are not equipped or trained for radiological response, and thus, cannot be exposed to radiological contamination. Coast Guard assets will be restricted to activities and geographic locations that are air monitored for radioactive fallout and are certified to be safe without protective clothing or equipment. Consequently, the Coast Guard is unable to act as the primary responder for nuclear power plant disasters.*

*Kenneth C Jones, Commander  
Seventh Coast Guard District  
909 SE First Ave  
Miami, FL 33131  
September 29, 2008*

**5. It is not clear that critical emergency communications will be viable in the event of a loss of power and back-up power at the site.**

**6. It is not appropriate to assume (NUREG-0396) that the magnitude of a radiological event and the circumstances of distribution of radioactivity during that event are modified by the probability of an accident occurring in a specific year. Emergency planning is based on the assumption that one is planning for an event. An event has the probability of 1 in 1. See Attachment C-1 Risk.**

#### **Amendment to Contention 1**

-----  
One concern addressed in the Revised Petition in Contention 1, at 14, was the unlikelyhood of delivery of Potassium Iodide (KI) to in a timely manner. The Japanese Government admitted on March 21, 2011 that they had delayed the distribution of KI for three days.(1) (Attachment 1). As stated in an FDA publication on Radiation Emergencies (2) (Attachment 2) "As time is of the essence in optimal prophylaxis with KI, timely administration to the public is a critical consideration in planning the emergency response to a radiation accident and requires a ready supply of KI. State and local governments choosing to incorporate KI into their emergency response plans may consider the option of predistribution of KI to those individuals who do not have a medical condition precluding its use." (Page 8). It should be noted that, despite the instructions cited above, there is no provision in the State of Florida Radiological Emergency Management Plan for pre-distribution on KI. (3) On March 14, 2011, in response to an inquiry prompted by the Fukushima event, the Emergency Operations Center (DEM) of Miami Dade County sent an email

in reply (Attachment 3) with the following statement:

**Dear Sir: The Miami Dade Health Department, a State agency, has the responsibility for storing and distributing potassium iodide (KI) in the event of a nuclear power plant release that negatively effects the public. The KI is stored in a secure location within Miami-Dade County and is available in a number sufficient to provide the required dosage for the emergency planning zone population. The local plan makes the KI available to the public at its Emergency Reception Center. All these procedures and resources are verified by the Federal Emergency Management Agency (FEMA) and certified by the County and State each year. Thank you for your inquiry.**

According to Miami Dade County's DEM publication: Radiological Emergency Preparedness Program, page 8, and, as noted in the Revised Petition, at 14, one Emergency Reception Center is located at Tamiami Park in Miami Dade County which Google Maps shows to be 30 or 35 miles driving distance to the north from Turkey Point, depending on which route you use. The other Emergency Reception Center in Key Largo is 33 miles to the south. If we lay the current template of the experience of Fukushima over a potential nuclear event at Turkey Point, we can only conclude that the positioning of the KI and the plan are lacking. The NRC and the State and Local agencies responsible for Turkey Point might someday be in the position of the government of Japan in the statement they made on March 21, 2001, cited above; they did not distribute the KI in a timely manner.

(1) Mike Adams, [Natural News](#), March 21, 2011

(2) Guidance Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies **U.S. Department of Health and Human Services Food and Drug Administration Center for Drug Evaluation and Research (CDER) December 2001**

(3)

Miami-Dade County  
The Miami-Dade County  
Emergency Reception Center  
is located at Tamiami Park,  
SW 107th Ave., between  
SW 8th Street and Coral Way  
(24th Street). To get to this  
reception center, take the Florida  
Turnpike Extension to the  
SW 40th Street (Bird Road)  
exit or Tamiami Trail exit  
(SW 8th Street). Law enforcement  
officers will direct you to  
Tamiami Park.

Monroe County  
The Monroe County  
Emergency Reception Center  
and Shelter is located at the  
Key Largo School, 104801  
Overseas Hwy, Key Largo  
(mm104, US 1). Law enforcement  
officers will assist and  
direct you.

#### Distribution of potassium iodide tablets

The Florida Department of  
Health considers evacuation as  
an effective protective measure.  
If conditions warrant, the health  
department will make potassium  
iodide tablets available at  
the reception centers.  
For more information about  
potassium iodide, contact your  
county health department.  
Miami-Dade: (305) 623-3500  
Monroe: (305) 293-7500

As the pamphlet tells us, the KI tablets are safely, and remotely, stored miles away from  
the population most like to be in need of them. And the friendly law enforcement officers,  
with little else to do at such a time, will politely direct you to them. Sounds so civilized.

On March 31, 2010 we read this disturbing head line: **Fukushima evacuees**

**denied care over radiation concern** (exhibit 4) (by Julian (By Julian Ryall in Tokyo Thursday March 31 2011 in the Irish Independent)

“HUNDREDS of people evacuated from towns and villages close to the stricken Fukushima nuclear plant are being turned away by medical clinics and shelters over fears of radioactive contagion. Hospitals and temporary refuges are demanding that evacuees provide them with certificates confirming that they have not been exposed to radiation. ... TEPCO is reportedly offering up to Y400,000 (€3,417) a day for anyone willing to work at the plant. Employees are being described in the Japanese media as modern-day samurai or "suicide squads". (© Daily Telegraph, London). “

On March 27, 2011 we read: **Shelters starting to require radiation-free 'certificates'** (Mar 27,2011) ([Japan Today: Japan News and Discussion](#)).

“At the entrance of a sports gymnasium in Fukushima city earlier this month, a doctor wearing a white hat, mask and gloves was seen holding a **radiation** monitor over the hands of a visiting resident. The doctor then held it over the person’s forehead, abdomen and back. The resident was then asked to raise their heels to check the back of the shoes at the end of the procedure to get a reading on the monitor. The doctor then held it over the person’s forehead, abdomen and back. ... “Certificates” are then issued by the doctors to those who have been declared free of any abnormality.”

The significance of these reports of denial of treatment, the need to send workers on suicide missions into contaminated situations and issuance of radiation free certificates is to point up the impossibility of ever being sufficiently prepared for what can evolve in a nuclear accident or catastrophic natural event which impacts a nuclear facility. It is not unlike going into a war; you never can predict how it will evolve and play out. Nothing in the arm chair platitudes of

federal, state or local planners as reflected in their regulations and publications speaks to the horrible situations we are hearing about following the Fukushima disaster. Except for the letter from the U.S.Coast Guard refusing to commit soldiers to a nuclear situation, not one governmental agency has realistically evaluated the risk despite the requirement. There are requirement in the regulations to make training excercises realistic but there is not requirement that planning also be subjected to that standard. Perhaps the lesson from Fukushima will be to bring that level of brainstorming and thinking to the planning tables.

<http://www.independent.ie/world-news/asia-pacific/fukushima-evacuees-denied-care-over-radiation-concern-2601963.html>

**Contention 2 -- FAILURE AND OMISSION OF THE FPL COL FOR THE PROPOSED TURKEY POINT NUCLEAR REACTORS 6&7 TO PROVIDE FOR THE SAFE AND ORDERLY EVACUATION OF THE POPULATION DURING OR FOLLOWING A NUCLEAR EVENT (UNUSUAL NUCLEAR OCCURANCE)**

**A. 1. Statement of the issue:**

**The evacuation plan does not meet the criteria of protect(ing) the health and safety of the public prescribed by the Atomic Energy Act of 1954, and as exemplified by 10 CFR 50.47. In addition, the increase in population, and findings of studies of actual population and institutional response to actual emergencies are not adequately reflected in the FPL emergency response plan. The plan, particularly with respect to evacuation / population response is therefore incomplete and also does not follow NUREG 0654 guidelines.**

**The evacuation plan does not reflect the**

**ii. brief explanation of the basis for the contention**

According to the population statistics provided by the FPL COL there are 187,374 people in the EPZ within 10 miles of Turkey Point 9; that number will increase to 280,000 by 2080. (ETE Table 3-2 EPZ Permanent Resident Population). The COL information ETE states that it will take from 6 to 11.4 hours to evacuate 100% of the population plus up to 6 hours for some of the population to prepare to evacuate. These evacuation and preparation times are too long to protect the health and safety of the public. If you had to evacuate 187,374 people in Kansas, you would have 360 compass degrees in which to do it. But since they are at the end of a peninsula with Everglades National Park as a western boundary, and Biscayne National Park and the Atlantic Ocean as an eastern boundary, there are only 30 compass degrees into which they can evacuate. Only one way to go: north. And only three roads on which to do it; U.S. Highway 1, The Florida Turnpike and Krome Avenue.

NUREG 0654 advocates evacuation over sheltering yet the FPL COL indicates that sheltering is an acceptable alternative for some part of the population. In addition, the use of the existing Turkey Point evacuation plan does not reflect the LARGE expansion in permanent population that has occurred between 1970 and now.

**TABLE 1:**

2000 Census Population of 10 mile evac radius Turkey Point  
Inland Population of Area in a 10-mile Evacuation Radius of Turkey Point

Zip code

33030	27 304
33031	5 514
33032	20 716
33033	31 394

33034	15 402
33035	2 762
33157	61 258
33170	8 460
33189	2 280
33190	4 820
Total	179 910

Please note that these are 2000 census figures which account only for residents. These figures do not include seasonal visitors, migrant workers, or people attending sports events and visiting parks and tourist attractions.

**TABLE 2 (excerpt from the COL)**

Turkey Point Units 6 & 7 Evacuation Time Estimate  
KLD Associates, Inc. ES -6 Revision 0

**Table 3-2 EPZ Permanent Resident Population**  
**Area 2000 Population                  2009 Population**

**Total 140,668                                  187,374**

Population Growth: 33.2%

The following is a compilation of figures above, and numbers from the 1970 US Census.

	1970	1990	2000	2006-2008 est	2009 est
Florida City	5133	5806	7843	na	9935
Goulds	6690	6004	7453	na	7453
Homestead	13674	26866	31909	49818	57936
Lakes by the Bay	<1000	525	9055	na	na
Leisure City	<1000	9369	22152	20713	na
Naranja	<1000	1556	4034	na	na
Princeton	<1000	1622	10090	na	na
South Miami Heights	10395	8369	33522	34582	na
total		38892	60117		126058
2080 pop estimate			267281		



The 2080 pop estimate is from the FPL ER.

The 1970 – 2009 growth from 38,892 to 187,374 is a 4.8-fold increase in the number of people who will be impacted on any day that Turkey Point has a problem. A four, nearly five-fold expansion is not credible in terms of asserting minor modification to a plan.

**(iii) The contention is within the scope of the proceeding**

The ATOMIC ENERGY ACT OF 1954 (Public Law 83–703 68 Stat. 919 August 30, 1954 TITLE I– ATOMIC ENERGY, CHAPTER 1– DECLARATION, FINDINGS, AND PURPOSE) states:

d. The processing and utilization of source, byproduct, and special nuclear material must be regulated in the national interest and in order to provide for the common defense and security *and to protect the health and safety of the public.* (Emphasis added).

e. Source and special nuclear material, production facilities, and utilization facilities are affected with the public interest, and regulation by the United States of the production and utilization of atomic energy and of the facilities used in connection therewith is necessary in the national interest to assure the common defense and *security and to protect the health and safety of the public.* (Emphasis added).

NRC Regulation 10 CFR Section 52.79 - Contents of applications; technical information in final safety analysis report, states:

“[t]he final safety analysis report shall include the following information at a level of

information sufficient to enable the Commission to reach a final conclusion on all safety matters that must be resolved by the Commission before issuance of the license.”

From Abstract of NUREG 0654: Studies of severe reactor accidents and their consequences since the issuance of NUREG-0654/FEMA-REP-1, Revision 1, have led the NRC staff to conclude that the preferred initial protective action for a severe (core damage) accident is to evacuate promptly rather than to shelter the population near the plant, barring any constraints to evacuation. The guidance in this document is intended to update and simplify the decisionmaking process for protective actions for severe reactor accidents given in Appendix 1 to NUREG-0654/FEMAREP.

Excerpting from NRC regs:

### **§ 50.47 Emergency plans.**

(a)(1)(i) Except as provided in paragraph (d) of this section, no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. No finding under this section is necessary for issuance of a renewed nuclear power reactor operating license.

(ii) No initial combined license under part 52 of this chapter will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. No finding under this section is necessary for issuance of a renewed combined license.

Clearly NRC has the intent of fulfilling the charge of the Atomic Energy Act, even to the point of offering to *decline a license* (rare) as in:

(c)(1) Failure to meet the applicable standards set forth in paragraph (b) of this section may result in the Commission declining to issue an operating license;

And paragraph (b) is very detailed in its specificity:

(b) The onsite and, except as provided in paragraph (d) of this

section, offsite emergency response plans for nuclear power reactors must meet the following standards:

- (1) Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the Emergency Planning Zones have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.
- (2) On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified.
- (3) Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility have been made, and other organizations capable of augmenting the planned response have been identified.
- (4) A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.
- (5) Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and followup messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.
- (6) Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.

(7) Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.

(8) Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

(9) Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

(10) A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.

(11) Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

(12) Arrangements are made for medical services for contaminated injured individuals.

(13) General plans for recovery and reentry are developed.

(14) Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.

(15) Radiological emergency response training is provided to

those who may be called on to assist in an emergency.

(16) Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.

## **The NRC might be violating the 14<sup>th</sup> Amendment to the U.S. Constitution and making a change in NRC policy.**

The 14<sup>th</sup> Amendment requires equal protection under the law. This directive might violate that obligation:

On March 18, 2011, the US Department of State issued the following travel warning: (Attachment 6 to this Amended Contention)

**“The United States Nuclear Regulatory Commission (NRC) recommends that U.S. citizens who live within 50 miles (80 kilometers) of the Fukushima Daiichi Nuclear Power Plant evacuate the area or take shelter indoors if safe evacuation is not practical. The State Department strongly urges U.S. citizens to defer travel to Japan at this time and those in Japan should consider departing. ... Consistent with the NRC guidelines that would apply to such a situation in the United States, we are recommending, as a precaution, that U.S. citizens within 50 miles (80 kilometers) of the Fukushima Daiichi Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical.”**

<https://www.osac.gov/Pages/ContentReportDetails.aspx?cid=10685>

The directive might have misspoke. Current EPZ rules only address the ingestion of food and liquid in the ingestion pathway EPZ, the area between 10 and 50 miles from the site of a nuclear plume release.

[www.nrc.gov/...rm/.../emerg-plan-prep-nuc-power-bg.html](http://www.nrc.gov/...rm/.../emerg-plan-prep-nuc-power-bg.html) - [Cached](#) - [Similar](#)

## ***Emergency Planning Zones***

For planning purposes, the NRC defines two emergency planning zones (EPZs) around each nuclear power plant. The exact size and configuration of the zones vary from plant to plant due to local emergency response needs and capabilities, population, land characteristics, access routes, and jurisdictional boundaries. The two types of EPZs are:

The plume exposure pathway EPZ extends about 10 miles in radius around a plant. Its primary concern is the exposure of the public to, and the inhalation of, airborne radioactive contamination.

The ingestion pathway EPZ extends about 50 miles in radius around a plant. Its primary concern is the ingestion of food and liquid that is contaminated by radioactivity.

In view of this admonition from both the NRC and the U.S. Department of State and the statement that this is “consistent with NRC guidelines, this must be a change in NRC guidelines since the ingestion pathway has now become an evacuation zone, not just an ingestion zone. **If the NRC believes that a 10-mile evacuation radius is inadequate during a severe radiological emergency, the written guidelines should be revised accordingly.**

Further, the Fourteenth Amendment to the Constitution of the United States of America states: All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws. Therefore, CASE is amending Contention 2 to propose that, if the NRC and the U.S. Department of State believe a 50 mile radius of safety is necessary for U.S. Citizens near the crippled Fukushima plant, the Fourteenth Amendment requires equal protection under the law, so the same former ingestion pathway must now also become a plume exposure pathway extending from the site of the nuclear incident out 50 miles for all U.S. nuclear

power plants. CASE is requesting that the 50 mile criteria be imposed at Turkey Point in the siting determination for 6 & 7. Potential traffic evacuation patterns up to 50 miles away, especially to the north, must be analyzed including the impact of "Shadow Evacuation" in the revised EPZ on traffic coming out of Homestead. **If a 50 mile plume exposure pathway is imposed on U.S.citizens in Japan, the 14<sup>th</sup> Amendment requires that It be the standard for U.S.citizens in the Continental U.S. and its territories**

### **The loss of engineered safety features**

NUREG 0396 (page III-7 to III-8) states:

The loss of either some or all engineered safety features are postulated in Class 9 accidents. If the engineered safety features are lost during an accident, then the LPZ has no meaning with regard to the size of the areas around the plant in which emergency response would be appropriate.

Clearly the Station Blackout event at the Fukushima Daichi site in Japan demonstrates the loss of engineered safety features is possible and the CASE contentions on emergency planning and evacuation should be heard in full.

**Today, March 18, 2011, the following was released by the Japanes government; it speack for it self and underscores the basis for Contention 2:**

**Exhibit 8 – Video: Japanese government expands evacuation zone**  
[http://www.msnbc.msn.com/id/42555888/ns/us\\_news-life/](http://www.msnbc.msn.com/id/42555888/ns/us_news-life/)

The NRC and all involved is safety planning for nuclear reactors cannot ignore this information and its implications.

**(iv) The contention is material to the findings the NRC must make to support**

**the action that is involved in the proceeding:**

As is stated in 50.47, NRC will deny a license if the appropriate plan is not in place. The FPL plan is not appropriate. The plans and procedures provided in the subject COL assume a perfect situation where everyone follows them and there is no emotional or situational anxiety present. Experience and studies have shown that in extreme evacuation situations the public will not follow an orderly procedure. Panic and fear prevail and any attempt at planned evacuation is impossible, especially in a nuclear event.

It is also the case that many trained workers on whom the authorities are planning to maintain order and carry out assigned duties do not do so and join the evacuation. If they have families, you must assume that their safety will supersede that of others.

By adding two nuclear reactors to the two already at Turkey Point, the possibility and probability of a nuclear event is increased exponentially. And an event would not have to be catastrophic; even a rumor of a significant leak of radio active gas or vapor could cause panic in the area. Also, since there are two non-nuclear power plants at Turkey Point, a nuclear event could result in shutting them down also due to lack of workers and operators who would most likely not be willing to stay or return to a radioactive site.

**(v) Facts or expert opinions**

**The logistics of evacuating 187,000 people are greater than can be achieved on short notice and in a situation of panic following what is sure to be incomplete and in accurate information. Simply ensuring that there will be sufficient gasoline for that many cars is a major undertaking. Lines at the pumps would be blocks long and the supply of gasoline would soon run out. And who is to guarantee that the station owners or managers will stay around given the threat to themselves and their families. It is an impossible situation. Build the reactors somewhere else.**

Evacuation from a nuclear event is far different from evacuation from other events.



Using evacuations from natural and other technological hazards as a basis for comparison, we can conclude that evacuations in response to nuclear power plant accidents are likely to be characterized by an extreme over-response to limited protective action advisories; this phenomenon needs to be considered in behaviorally-based radiological emergency response planning.

### ***Emergency Planning Zones***

For planning purposes, the NRC defines two emergency planning zones (EPZs) around each nuclear power plant. The exact size and configuration of the zones vary from plant to plant due to local emergency response needs and capabilities, population, land characteristics, access routes, and jurisdictional boundaries. The two types of EPZs are:

The plume exposure pathway EPZ extends about 10 miles in radius around a plant. Its primary concern is the exposure of the public to, and the inhalation of, airborne radioactive contamination.

The ingestion pathway EPZ extends about 50 miles in radius around a plant. Its primary concern is the ingestion of food and liquid that is contaminated by radioactivity.

In view of this admonition from both the NRC and the U.S. Department of State and the NRC believe that a 10-mile evacuation radius is grossly inadequate during a severe radiological emergency. These plans should take into consideration the fact that the population within the 10-mile radius around Turkey Point is already in excess of the capacity of the roads leading away from the plant, and that evacuation of a 50-mile radius around Turkey Point would be an evacuation of nearly the entire population of Miami-Dade County, which is the eighth most populous county in the United States, according to the 2010 US census. (2) It should also be noted that a 50 miles radius from Turkey Point covers almost all of Miami Dade County and its over 2.5 million people.

The lessons learned from the Three Mile Island accident provide a very important experience for emergency planners to seriously consider in determining the viability of executing their nuclear accident emergency plan. A study into the human response in the

aftermath of TMI was published in "Evacuation Behavior In Response To Nuclear Power Plant Accidents," by Donald Zeigler and James Johnson, Jr. in the May, 1984 issue of The Professional Geographer.

Here are some of their findings:

**1. To plan for only a 10 mile evacuation is to significantly under plan for a nuclear power station accident.**

The 10-mile emergency planning zone is a politically arbitrary distance. It has no bases in meteorology, radiation releases mechanisms and human behavior. In fact studies of human behavior following the Three Mile Island accident in 1979, where a limited evacuation advisory was issued by Pennsylvania Governor Thornberg, provides evidence that people will be spontaneously leaving their homes well beyond the current 10-mile planning zones. This human behavior phenomenon has been termed the "evacuation shadow effect." This evacuation shadow is determined by people who believe themselves to be at risk who evacuate even though they have not been ordered or advised to do so by officials. The study of human behavior around the Three Mile Island accident showed that if only the government advised people, specifically pregnant mothers and pre-school children, had left a 5 mile radius, that number would have been about 3400 evacuees. Instead, up to as many as 200,000 people actually evacuated, approximately 39% of the population within 15 miles of the reactor. The "shadow" evacuation phenomenon is not expected to begin to diminish until approximately 25-miles out from the reactor. The study found that in addition to the high rate of voluntary evacuation, those evacuees tended to travel distances much greater than has been observed in previous studies on non-nuclear related evacuation behavior (hurricanes, floods, etc.). The TMI study evidenced that the median distanced traveled by evacuees was 85 miles. The NRC commissioned a study (Flynn 1979) that evidenced an average distance of 100 miles of travel.

**· To locate all the public shelters and reception centers immediately beyond the 10-mile EPZ is to invite under-utilization and chaos.**

Currently all shelters and reception centers for evacuees within the current planning zone are located in a 10-20 mile range from the reactor. Anyone who takes shelter in them will likely watch the resident population from that zone pack into their cars and heads farther away. Ionizing radiation is such a dreaded invisible threat people will want to put as much distance as possible between them and the accident site.

**\_ To depend on buses to evacuate populations without cars (school children, the elderly, and prison and hospital populations) is to ignore role conflicts within the emergency personnel designated as drivers and vital to successful evacuation.**

Those people who are depended upon to drive buses are not likely to be professional emergency workers. They may not respond, especially if they have family of their own. They may delay response as a result of role conflict

between emergency duty and home. It is reasonable to assume that they are most likely to tend to their families first. Social surveys of personnel with assigned emergency duties indicate the strong potential for role conflict to interfere with the management of a nuclear emergency. Research conducted in the vicinity of the now closed Shoreham nuclear power station on Long Island, NY questioned bus drivers and volunteer fireman "What do you think you would do first if an accident requiring a full scale evacuation of the population within 10 miles of the nuclear reactor were to occur?"

The results found that 68% of 291 fire fighters, 73% of the 246 bus drivers indicated that family obligations would take precedence over emergency duties. The consequence of such choice would be a failed response to the nuclear emergency.

Additionally, during the TMI accident role conflict was documented among many emergency workers including the exodus of physicians, nurses, and technicians required to staff both the short term and long term medical facilities. At one local hospital, only six of 70 physicians who were scheduled for weekend emergency duty reported for work. None of the hospitals researched in the study were in the 5 mile radius of the evacuation advisory. Other instances where role conflict occurred were the Pennsylvania National Guard and even nuclear power plant workers.

**1. To package information for radiological accident emergency planning as similar to an emergency response to other disasters (i.e. hurricanes) is to ignore that there are major differences in how people respond to these very different events.**

Nuclear power plant operators and emergency planners characterize nuclear power plant disaster planning as no different than that for a hurricane or some other disaster. The public clearly perceives a difference of threat and consequences from a nuclear meltdown and that of a hurricane. But nuclear utilities, emergency planners and the NRC refuse to acknowledge these distinct differences in actual threat, public perceptions and fears of the harm that can occur as the result of a nuclear power accident on scale of the Chernobyl accident in Ukraine, and other catastrophes. The harm derived from a nuclear accident both short term and long term includes deadly radiation sickness, cancer, birth defects and spontaneous abortions. The magnitude of public response to be greater than an evacuation from a natural disaster should be acknowledged and factored into emergency planning.

**5) To expect to "manage" the evacuation response is not realistic.**

People will manage their own evacuation response. They will head out in their own cars as quickly as possible and try to get on the few available roads and will slow the entire evacuation process down. They will end up in traffic jams in bottlenecks that are beyond the evacuation zones that will likely trap the intended evacuees in traffic jams closer to the nuclear reactor and most immediately under any escaping radiation plume.

Ultimately, the only relevant protection, however, is prevention. If you want real civil defense, then we must shut these dangerous and aging reactors down.

**Petitioners' closing statement:**

The answer to this difficult situation is to not put people into it in the first place. Build nuclear power plants where evacuation is not a problem and is not in a confined area which the land and roadways surrounding Turkey Point have created. Turkey Point has outgrown its location as a place to produce power which has any potential for a nuclear incident. It is irresponsible for all authorities involved to put the residents and visitors at risk in this manner; the Atomic Energy Act demands that they not do so. Either build 6&7 somewhere else or use energy conservation and efficiency to reduce the need for power or recommend alternative energy sources and distributed/decentralized production of power. Every home and business should produce its own power. A monolithic, central source of power which must then be transmitted over great distances is nineteenth century technology. Germany and China are doing better.

We can do better.

**Amendment to Contention 2**

In CASE's Petition to Intervene and Request for Hearing of August 18, 2010(Original) and of August 20, 2010 (Revised), at 16, 17 and 18, a summary is presented of the subject FPL COL'sL population statistics and evacuation times for the 10 Mile EPZ only. No discussion or information is presented in the FPL COL for evacuation of the population beyond 10 miles. The so called "Shadow Evacuation" area is not mentioned. The events at Fukushima make this omission very poignant and prescient and present a clear lesson for evacuation planners; it must be factored in.

On March 18, 2011, the US Department of State issued a travel warning that contained the following recommendations to U.S. citizens:

“The United States Nuclear Regulatory Commission (NRC) recommends

that U.S. citizens who live within 50 miles (80 kilometers) of the Fukushima Daiichi Nuclear Power Plant evacuate the area or take shelter indoors if safe evacuation is not practical. The State Department strongly urges U.S. citizens to defer travel to Japan at this time and those in Japan should consider departing.

Travel Warning: Japan, U.S. Department of State, (Updated March 18, 2011).

...”Consistent with the NRC guidelines that would apply to such a situation in the United States, we are recommending, as a precaution, that U.S. citizens within 50 miles (80 kilometers) of the Fukushima Daiichi Nuclear Power Plant evacuate the area or to take shelter indoors if safe evacuation is not practical.”

<https://www.osac.gov/Pages/ContentReportDetails.aspx?cid=10685>

EPZs for power reactors are discussed in NUREG-0396; EPA 520/1-78-016, “Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants,” December 1978. The size of the EPZs for a nuclear power plant shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries. The size of the EPZs also may be determined on a case-by-case basis for gascooled nuclear reactors and for reactors with an authorized power level less than 250 MW thermal. Generally, the plume exposure pathway EPZ for nuclear power plants with an authorized power level greater than 250 MW thermal shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius.

In the Revised Petition at 24, CASE’s expert witness Donald Zeigler and James Johnson, Jr are quoted as saying “**To plan for only a 10 mile evacuation is to significantly under plan for a nuclear power station accident.**” **Could their**

**words have possibly been proved truer than the example present at Fukushima.**

**And the cited March 18, 2011 direction of the NRC and the State Department makes the case: 50 miles is the range of concern, not 10.**

A study into the human response in the aftermath of TMI was published in "Evacuation Behavior In Response To Nuclear Power Plant Accidents," by Donald Zeigler and James Johnson, Jr. in the May, 1984 issue of The Professional Geographer.

Here are some of their findings:

**1. To plan for only a 10 mile evacuation is to significantly under plan for a nuclear power station accident.**

The 10-mile emergency planning zone is a politically arbitrary distance. It has no bases in meteorology, radiation releases mechanisms and human behavior. In fact studies of human behavior following the Three Mile Island accident in 1979, where a limited evacuation advisory was issued by Pennsylvania Governor Thornberg, provides evidence that people will be spontaneously leaving their homes well beyond the current 10-mile planning zones. This human behavior phenomenon has been termed the "evacuation shadow effect." This evacuation shadow is determined by people who believe themselves to be at risk who evacuate even though they have not been ordered or advised to do so by officials. The study of human behavior around the Three Mile Island accident showed that if only the government advised people, specifically pregnant mothers and pre-school children, had left a 5 mile radius, that number would have been about 3400 evacuees. Instead, up to as many as 200,000 people actually evacuated, approximately 39% of the population within 15 miles of the reactor. The "shadow" evacuation phenomenon is not expected to begin to diminish until approximately 25-miles

Actual wording from: Backgrounder on Emergency Preparedness at Nuclear Power Plants

[www.nrc.gov/...rm/.../emerg-plan-prep-nuc-power-bg.html](http://www.nrc.gov/...rm/.../emerg-plan-prep-nuc-power-bg.html) - [Cached](#) - [Similar](#)

### ***Emergency Planning Zones***

For planning purposes, the NRC defines two emergency planning zones (EPZs) around each nuclear power plant. The exact size and configuration of the zones vary from plant to plant due to local emergency response needs and capabilities, population, land characteristics, access routes, and jurisdictional boundaries. The two types of EPZs are:

The plume exposure pathway EPZ extends about 10 miles in radius around a plant. Its primary concern is the exposure of the public to, and the inhalation of, airborne radioactive contamination.

The ingestion pathway EPZ extends about 50 miles in radius around a plant. Its primary concern is the ingestion of food and liquid that is contaminated by radioactivity.

In view of this admonition from both the NRC and the U.S. Department of State and the NRC believe that a 10-mile evacuation radius is grossly inadequate during a severe radiological emergency. These plans should take into consideration the fact that the population within the 10-mile radius around Turkey Point is already in excess of the capacity of the roads leading away from the plant, and that evacuation of a 50-mile radius around Turkey Point would be an evacuation of nearly the entire population of Miami-Dade County, which is the eighth most populous county in the United States, according to the 2010 US census. (2) It should also be noted that a 50 miles radius from Turkey Point covers almost all of Miami Dade County and its over 2.5 million people.

The Fourteenth Amendment to the Constitution of the United States of America states: All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

CASE is amending Contention 2 to propose that, if the NRC and the U.S. Department of State believe a 50 mile radius of safety is necessary for U.S. Citizens near the crippled Fukushima plant, the Fourteenth Amendment requires equal protection under the law, so the same 50 mile are must be addressed for safety for

all U.S. nuclear power plants. CASE is requesting that the 50 mile criteria be imposed at Turkey Point in the siting determination for 6 & 7. By looking at potential traffic evacuation patterns up to 50 miles away, especially to the north, is timely evacuation possible? CASE suspects not, in which case a siting license should not be issued. This lesson from Fukushima should be applied to Turkey Point 6 & 7 in fairness to all of our citizens as required by the Fourteenth Amendment.

### **Possible addition to policy and regulation by NRC**

The March 18, 2011 direction by the State Department and the NRC might differ from printed policy. Here is a citation from the NRC's Backgrounder on Emergency Preparedness at Nuclear Power Plants:

[www.nrc.gov/...rm/.../emerg-plan-prep-nuc-power-bg.html](http://www.nrc.gov/...rm/.../emerg-plan-prep-nuc-power-bg.html) - [Cached](#) - [Similar](#)

### ***Emergency Planning Zones***

For planning purposes, the NRC defines two emergency planning zones (EPZs) around each nuclear power plant. The exact size and configuration of the zones vary from plant to plant due to local emergency response needs and capabilities, population, land characteristics, access routes, and jurisdictional boundaries. The two types of EPZs are:

The plume exposure pathway EPZ extends about 10 miles in radius around a plant. Its primary concern is the exposure of the public to, and the inhalation of, airborne radioactive contamination.

The ingestion pathway EPZ extends about 50 miles in radius around a plant. Its primary concern is the ingestion of food and liquid that is contaminated by radioactivity.

Please note that here the 50 Mile radius only refers to the ingestion of food and liquid which might be contaminated while the March 18 directive concerns evacuation with no reference to food or liquid. This speaks to CASE's assertion



in the Revised Petition at X, that (cite professor's first point). The dynamic of an actual incident, as we are learning more than a month after Fukushima, is unpredictable.

### **NUREG-0396: NO SPECIAL PLANNING BEYOND 10 MILES**

Planning guidelines specifically directed planners to not do extraordinary planning or preparation beyond the 10 mile EPZ in the 50 mile EPZ. The only concern to be addressed beyond 10 miles was food and livestock.

NUREG-0396; EPA 520/1-78-016, PLANNING BASIS FOR THE DEVELOPMENT OF STATE AND LOCAL GOVERNMENT RADIOLOGICAL EMERGENCY RESPONSE PLANS IN SUPPORT OF LIGHT WATER NUCLEAR POWER PLANTS, at 13-17, states:

“For the ingestion exposure Emergency Planning Zone, (now called the Ingestion Pathway EPZ, 10 to 50 miles from a plant, authors note) the planning effort involves the identification of major exposure pathways from contaminated food and water and the associated control points and mechanisms. ... The EPZ guidance does not change the requirements for emergency planning, it only sets bounds on the planning problem. **The Task Force does not recommend that massive emergency preparedness programs be established around all nuclear power stations. (emphasis added)** The following examples are given to further clarify the Task Force guidance on EPZs:

**No** special local decontamination provisions for the general public (e.g., blankets, changes of clothing, food, special showers)

**No** stockpiles of anti-contamination equipment for the general public

**No** construction of specially equipped fallout shelters

**No** special radiological medical provisions for the general public

**No** new construction of special public facilities for emergency use

**No** special stockpiles of emergency animal feed

**No** special decontamination equipment for property and equipment

**No** participation by the general public in test exercises of emergency plans.

Some capabilities in these areas, of course, already exist under the general emergency plans of Federal and State agencies.

## B. Size of the Emergency Planning Zone

Several possible rationales were considered for establishing the size of the EPZs. These included risk, probability, cost effectiveness and accident consequence spectrum. After reviewing these alternatives, the Task Force chose to base the rationale on a full spectrum of accidents and corresponding consequences tempered by probability considerations. These rationales are discussed more fully in Appendix I.

The Task Force agreed that emergency response plans should be useful for responding to any accident that would produce offsite doses in excess of the PAGs. This would include the more severe design basis accidents and the accident spectrum analyzed in the RSS. After reviewing the potential consequences associated with

these types of accidents, it was the consensus of the Task Force that emergency plans could be based upon a generic distance out to which predetermined actions would provide dose savings for any such accidents. Beyond this generic distance it was concluded that actions could be taken on an ad hoc basis using the same considerations that went into the initial action determinations.

The Task Force judgment on the extent of the Emergency Planning Zone is derived from the characteristics of design basis and Class 9 accident consequences. Based on the information provided in Appendix I and the applicable PAGs a radius of about 10 miles was selected for the plume exposure pathway and a radius of about 50 miles was selected for the ingestion exposure pathway, as shown in table 1. Although the radius for the EPZ implies a circular area, the actual shape would depend upon the characteristics of a particular site. The circular or other defined area would be for planning whereas initial response would likely involve only a portion of the total area. The EPZ recommended is of sufficient size to provide dose savings to the population in areas where the projected dose from design basis accidents could be expected to exceed the applicable PAGs under unfavorable atmospheric conditions. As illustrated in Appendix I, consequences of less severe Class 9 accidents would not exceed the

PAG levels outside the recommended EPZ distance. In addition, the EPZ is of sufficient size to provide for substantial reduction in early severe health effects (injuries or deaths) in the event of the more severe Class 9 accidents.

Table 1. Guidance on Size of the Emergency Planning Zone

Critical Organ and  
Accident Phase Exposure Pathway EPZ Radius  
Plume Exposure Whole body (external) about 10 mile radius\*  
Pathway  
Thyroid (inhalation)  
Other organs (inhalation)  
Ingestion Pathway\*\* Thyroid, whole body, about 50 mile radius\*\*\*  
bone marrow (ingestion)

Judgment should be used in adopting this distance based upon considerations of local conditions such as demography, topography, land characteristics, access routes, and local jurisdictional boundaries.

\*\* Processing plants for milk produced within the EPZ should be included in the emergency response plans regardless of their location.

\*\*\*The recommended size of the ingestion exposure EPZ is based on an expected

revision of milk pathway Protective Action Guides based on FDA-Bureau of Radiological Health recommendations. The Task Force understands that measures such as placing dairy cows on stored feed will be recommended for projected exposure levels as low as about 1.5 rem to the infant thyroid. Should the current FRC guidelines, 10 rem 8), be maintained, an EPZ of about 25 miles would achieve the objectives of the Task Force.

<http://pbadupws.nrc.gov/docs/ML0513/ML051390356.pdf>

Reviewing the prescription above for designing and stocking the EPZ in light of the experience at Fukushima, as well as Chernobyl and Three Mile Island, one must ask, was this responsible and forward looking advice and direction? Would the residents of the three accident sites mentioned above have been better served by having the **No** items and provisions in place? Was, is it, prudent to only be concerned only “with the ingestion of food and liquid that is contaminated by radioactivity.”? (cited above). How does that square with

this report: **Japanese Shelters Report Shortage of Food, Water**

**(VOA News March 17, 2011) Japanese officials report increasing problems in getting food and water to hundreds of thousands of people who remain in makeshift shelters almost a week the nation's worst recorded earthquake triggered a devastating tsunami. Freezing temperatures and snow compounded the misery as hope faded for finding more people alive in the remains of coastal communities destroyed by Friday's tsunami. ... Agriculture ministry officials said they are unable to get ample supplies to more than half a million people in shelters across**

the country's northeast because of gasoline shortages and the damage to infrastructure. They said 1.25 million meals and almost three-quarters of a million beverage bottles were sent out to five affected provinces between Saturday and Tuesday, but that was far short of the needs. Traffic jams: The ministry said delivery trucks have been hampered by long lines of cars which block highways while waiting for hours to purchase gasoline. Relief efforts are also hampered by heightened radiation levels in the area of the damaged Fukushima nuclear plant, which lies between Tokyo and the worst affected areas. Supplies of heating fuel are also low at many of the shelters, where earthquake victims have had to cope with several nights of sub-freezing temperatures. Tens of thousands of homes have been damaged and whole communities have been washed away, leaving many with nowhere else to go.

**Chilly weather:** In the coastal city of Ofunato, where several international rescue teams have been searching for survivors, the head of a U.S. team reported that the temperature Wednesday evening was -5 Celsius and more than eight centimeters of snow had fallen. Some information for this report was provided by AP, AFP and Reuters.

### **Observation regarding NUREG-0396**

One must wonder if the authors of NUREG -0396 were aware that the United States is subject to rather severe winters; nuclear disasters do not check on the weather before occurring and then only do so if the temperature is above 60 degrees Fahrenheit. Again, the lessons from Fukushima tell us that the written policies and the mind set of those drafting policy could benefit from a thorough study of the three major nuclear events we have experienced.

Around the subsequent direction issued on March 18, 2011, it would seem that the subject should be re-visited. Clearly,

in real time, 10 miles was far too conservative an estimate of what would be required for public safety. .

Map of Evacuation Zones Around Japan Nuclear Plant - Interactive Feature -  
NYTimes.com

<http://www.nytimes.com/interactive/2011/03/16/world/asia/japan-nuclear-evacuation-zone.html?emc=eta1>

**Contention 5 – FAILURE AND OMISSION OF THE FPL COL  
FOR THE PROPOSED TURKEY POINT NUCLEAR REACTORS**

**6&7 analysis to consider or incorporate any  
scientifically valid projection for sea level rise and climate change through  
the end of this century and beyond.**

CONTENTION: FIVE

I, Harold R. Wanless, on behalf of CASE (Citizens Allied for Safe Energy) have the following contentions and concerns over the proposal to add additional nuclear power plant facilities at Turkey Point. The FPL COL application for two new nuclear reactors at Turkey Point must be considered invalid – both the FSAR (for instance Chapter 2) and also the ER analyses (these matters are relevant to nearly every chapter of the ER) because neither considers and neither incorporates any scientifically valid projection for sea level rise through this century and beyond. Doing so will dramatically diminish and likely negate the viability of this proposal.

Such a consideration is expressly required by 10 CFR 52.79

1. Human-induced atmospheric warming is recognized to be rapidly warming the polar regions of Earth (Bindoff et al., 2008; National Research Council, 2010) leading to warming Arctic and Antarctic Ocean waters, accelerating melt of permafrost and tundra (Schoor et al., 2008; and Zimov et al., 2006), destabilization of methane hydrates (Shakhova et al, 2010), and accelerating melting of the Greenland and Antarctic Sheets (Van den Broeke et al., 2009; Velicogna, 2009; Kerr, 2009; and Jiang et al., 2010). This is leading to accelerating global sea level rise.
1. Sea level has been rising at an accelerated rate since about 1930 (Wanless et al., 1994). This has resulted in a about a 9-inch rise of sea level in south east Florida. This rise is about the global rate of sea level rise. Presently global and south Florida sea level is rising at just greater than one foot (30 cm) per century but is accelerating at 0.17 millimeters per year.
1. The Science Committee (of which I am Chair) of the Miami-Dade County Climate Change Advisory Task Force issued a projection of future sea level rise for south Florida, stating that:

“With what is happening in the Arctic and Greenland, many respected scientists<sup>4</sup> now see a likely sea level rise of **at least** 1.5 feet in the coming 50 years and a total of **at least** 3-5 feet by the end of the century, possibly significantly more. Spring high tides would be at +6 to +8 feet. This does not take into account the possibility of a catastrophically rapid melt of land-bound ice from Greenland, and it makes no assumptions about Antarctica” (MDC-CCATF, 2008).

Since issuing this statement, Ice Sheet melting has dramatically increased on both Greenland and Antarctica (Van den Broeke et al., 2009; Velicogna, 2009; Kerr, 2009; and Jiang et al., 2010). More recent projections of sea level rise through the century are at or above the levels of our 2008 statement (Rahmstorf, 2010).

1. All climate and sea level assessments agree that ice melt, and sea level rise will be accelerating into the next century. This means that we will not be adjusting living with a three- or five-foot sea level rise but one that is continues rising at an accelerating rate. If we have reached plus five feet by the end of the century, sea level will be rising at a foot per decade.
  
1. Circular No. 1165-2-211 of the United States Army Corps of Engineers, issued July 1, 2009, specifically directs incorporation of “the direct and indirect physical effects of projected future sea-level change in managing, planning, engineering, designing, constructing, operating, and maintaining USACE projects and systems of projects. Recent climate research by the Intergovernmental Panel on Climate Change (IPCC) predicts continued or accelerated global warming for the 21st Century and possibly beyond, which will cause a continued or accelerated rise in global mean sea-level. Impacts to coastal and estuarine zones caused by sea-level change must be considered in all phases of Civil Works programs” (USACOE, 2009). Surely a major addition to a nuclear power plant facility should fall under similar scrutiny.
  
1. I am not aware that sea level rise in all its ramifications has been considered and/or incorporated into the proposal for significant expansion of the Turkey Point nuclear facility.
  
1. It is critical that a realistic projected sea level rise through this century and beyond an understanding of the rates of sea level rise be carefully considered and incorporated into the evaluation. Rising sea level will have significantly have changed the coastal environments, base-level elevations, storm surge patterns, and population and demographics of southeast Florida by the time the proposed units come on line – and rising sea level will dramatically diminish southeast Florida and it population by the end of the century.
  - a. Incorporating future sea level changes will affect the population trends for the south Florida area and as such the future power needs.
  
  - a. Incorporating future sea level changes will change the viability of a nuclear power complex that is increasingly isolated from the mainland and sitting in the middle of a combined Biscayne/Florida Bay.

- a. Incorporating future sea level changes will change the safety of the complex during major storms and terrorist threats.
  
- a. Incorporating future sea level changes will dramatically change the ability of the associated cooling complex to function and to remain isolated from and prevent harm to the adjacent marine environment.
  
- a. Incorporating future sea level changes will change the ability of the complex to contain any nuclear accidents.
  
- 1. Do not see that any of this has been addressed.

## REFERENCES

- Bindoff, N.L., et al., 2007. IPCC, Working Group 1: The Physical Science Basis of Climate Change, Fourth Assessment Report. United Nations, Intergovernmental Panel on Climate Change.
- Jiang, Y., Dixon, T.H., Wdowinski, S., 2010. Accelerating uplift in the North Atlantic region as an indicator of ice loss. *Nature Geoscience*, Published online: 16 May 2010 | DOI: 10.1038/NGEO845, 4 p., and supplementary information online, 25 p.
- Kerr, R.A., 2009. Both of the world's ice sheets may be shrinking faster and faster. *Science*, v. 326, p. 217.
- MDC-CCATF, 2008. Statement on Sea Level in the Coming Century. Science and Technology Committee, Miami-Dade County Climate Change Advisory Task Force, Jan. 17, 2008, 9 p. Available online on page 28-36 at: [http://www.miamidade.gov/derm/library/08-10-04\\_CCATF\\_BCC\\_Package.pdf](http://www.miamidade.gov/derm/library/08-10-04_CCATF_BCC_Package.pdf).
- National Research Council, 2010. *Advancing the Science of Climate Change*, National Academies Press, Washington, 506 p. ISBN-13: 978-0-309-15460-4. <http://americasclimatechoices.org/panelscience.shtml>
- Rahmstorf, S., 2010. A new view on sea level rise. *Nature Reports, Climate Change*, v. 4, p. 44-45.
- Schuur, E.A.G., Bockheim, J., Canadell, J., Euskirchen, E., Field, C.B., Goryachkin, S.V., Hagemann, S., Kuhry, P., Lafleur, P., Lee, H., Mazhitova, G., Nelson, F.E., Rinke, A., Romanovsky, V., Shiklomanov, N., Tarnocai, C., Venevsky, S., Vogel, J.G., Zimov, S.A., 2008. Vulnerability of permafrost carbon to climate change: Implications for the global carbon cycle. *BioScience* v. 58, p. 701-714.
- Shakhova, N., Semiletov, Salyuk, A., Yusupov, V., Kosmach, D., and Gustafsson, 2010. Extensive methane venting to the atmosphere from sediments of the East Siberian Arctic

shelf. *Science*, v. 327, p. 1246, DOI: 10.1126/science.1182221

U.S. Army Corps of Engineers, 2009. Water Resources and Authorities Incorporating Sea-Level Change Considerations in Civil Works Programs. Circular No. 1165-2-211, Department of The Army, U.S. Army Corps of Engineers, Washington, DC 20314-1000, July 1, 31 p.

Van den Broeke, M., Bamber, J., Ettema, J., Rignot, E., Schrama, E., van den Berg, W., van Meijgaard, E., Velicogna, I, Wouters, B., 2009. Partitioning recent Greenland mass loss. *Science*, v. 326, p. 984-986 and supporting on-line material.  
<http://www.sciencemag.org/cgi/content/full/326/5955/984/DC1>

Velicogna, I., 2009. Increasing rates of ice mass loss from the Greenland and Antarctic ice Sheets revealed by GRACE. *Geophysical Research Letters*, v. 36, L19503, doi: 10.1029/2009GL040222, 4 p.

Wanless, H.R., Parkinson, R., and Tedesco, L.P., 1994. Sea level control on stability of Everglades wetlands, *in* Proceedings of Everglades Modeling Symposium. St. Lucie Press, FL, p. 199-223.

Zimov, S.A., E.A.G. Schuur, and F.S. Chapin III. 2006. Permafrost in the global carbon budget. *Science* v. 312, p.:1612-1613.

Respectfully submitted,  
Dr. Harold R. Wanless  
1231 Genoa Street,  
Coral Gables, FL 33134

Professor and Chair  
Department of Geological Sciences  
University of Miami  
P.O. Box 249176  
Coral Gables, FL 33124

Registered Florida Professional Geologist #985

## **Amendment to Contention 5**

This summary of the storm surge and wave height related to the Fukushima tsunami is from Wikipedia:

“The earthquake triggered extremely destructive tsunami waves of up to 37.9 meters (124 ft)[11] that struck Japan minutes after the quake, in some cases traveling up to 10 km (6 mi) inland,[12] with smaller waves reaching many other countries after several hours. ... On 18 March, Yukiya Amano—the head of the



International Atomic Energy Agency—described the crisis as "extremely serious."<sup>[18]</sup> Residents within a 20 km (12 mi) radius of the Fukushima I Nuclear Power Plant and a 10 km (6 mi) radius of the Fukushima II Nuclear Power Plant were evacuated. In addition, the U.S. recommended that its citizens evacuate up to 80 km (50 mi) of the plant.<sup>[19]</sup>"

For purposes of this discussion, while the storm surge was monumental and greater than any ever anticipated at Turkey Point, the fact that the sea surged six miles inland is significant for south Florida since most of its land is at or below sea level. There is nothing to stop a strong surge from the ocean so Turkey Point, Homestead and much of Miami Dade County can be flooded over from a strong storm. Indeed, Miami Beach roads are impassable with even a minor storm.

## **COMPREHENSIVE GEOLOGICAL ARTICLE**

The following comprehensive article published on March 24, 2011 and includes comments on Fukushima by Dr. Harold Wanless, the CASE expert witness who prepared Contention 5. Reviewing Dr. Wanless's observations in the Revised Petition in light of Fukushima reveals that his concerns and observations were well founded. <http://www.onearth.org/article/sea-level-rise-brings-added-risks-to-coastal-nuclear-plants>

## **Sea Level Rise Brings Added Risks to Coastal Nuclear Plants**

**Alyson Kenward (March 24, 2011) Earth Network**

Power has finally been restored to all the reactors at Fukushima Daiichi

nuclear power plant in Japan, nearly two weeks after the facility was ravaged by a 30-foot tsunami, giving Japanese officials new hope they can keep the crisis from spinning further out of control. With some of the immediate danger of a complete meltdown on hold and much hazardous work remaining, authorities are only starting to investigate exactly what happened, and what extra safety features might have prevented the disaster.

They're not the only ones. In many parts of the world, including the United States, nuclear reactors are often located near the ocean, due to their requirement for abundant supplies of water for cooling purposes. And while tsunamis aren't a threat everywhere, the sea can pose other challenges. Hurricanes, for example, can push walls of water ahead of them, like the storm surge that did most of the damage to New Orleans when Hurricane Katrina swept through in 2005. In fact, one U.S. nuclear plant has already been dealt a direct hit by a severe hurricane. In 1992, when Category 5 Hurricane Andrew hammered the Turkey Point power plant in southern Miami-Dade County, Fla., its nuclear reactors were unharmed despite extensive damage to other parts of the facility.

But scientists anticipate that in the future, sea level rise will cause hurricanes and their [storm surges](#), as well as flooding caused by other types of storms, to be more severe than during the past few decades. In the wake of the Japanese crisis, which involved a more devastating tsunami than planners anticipated, nuclear analysts in the U.S. are now asking themselves how vulnerable coastal nuclear plants are to a comparable emergency.

"After the events in Japan, we took a hard look at whether our operating facilities are protected, based on current regulations and operating procedures," says Roger Hannah, a senior public relations official with the [U.S. Nuclear Regulatory Commission](#) (NRC). Relying on models of expected flood

levels and storm surges, along with "real-world experience with hurricanes," the NRC believes all U.S. coastal nuclear facilities are already built to withstand the worst-case storm scenario, Hannah says. On March 23, the NRC also [launched an additional two-step review](#) of U.S. nuclear plants, aimed to last about three months.

Of course, the Fukushima Daiichi plant was also designed to withstand what officials considered a worst-case earthquake and tsunami, but that wasn't enough. All of the nine U.S. nuclear plants that are within two miles of the ocean were built at least 30 years ago. But during these three decades the [sea has been rising as a result of climate change](#) (not to mention local changes in the geology at some locations, where the land is sinking), and sea level will continue inching up throughout the next century. If the sea is higher to begin with, that means storm surges or tsunamis will pack an extra punch. The worst case, in short, could be worse than anyone imagined when these plants were first built.

Even without significant sea level rise, U.S. plants have already had some close calls. In the early morning hours of August 24, 1992, the center of Hurricane Andrew came ashore just eight miles from Florida's [Turkey Point nuclear plant](#). The storm was one of the worst to hit Florida's eastern shore in recorded history, and when it made landfall it sent 175 mile-per-hour winds across Turkey Point and tossed a 16-foot surge of water towards the reactors.

At Fukushima Daiichi, workers had just a few minutes warning that a tsunami was on its way; at Turkey Point, however, officials were aware of Hurricane Andrew's approach for days in advance. That extra time was crucial: employees began to shut the plant down a full 12 hours before the storm was scheduled to strike.

The reactors and their protective concrete shells, built nearly 20 feet above the ground, resisted Andrew's hurricane-force winds. Yet across the rest of the Turkey Point property, owned and operated by [Florida Power & Light Company](#)

(FPL), the combination of high winds and floodwaters brought down the fire-safety system, compromised the security system, and interrupted communication to stations off the property.

Potentially the most hazardous incident was a loss of access to external power for five days. Engineers at Turkey Point were forced to rely on the on-site diesel generators to maintain cooling of the reactors' cores. Fortunately, this back-up system was enough to keep everything operating safely. In Japan, however, an equivalent back-up system was wiped out by the tsunami.

"Hurricane Andrew is historic because this is the first time that a hurricane significantly affected a commercial nuclear power plant," wrote the NRC in a 1993 [review](#) of how Turkey Point fared during the emergency. While none of the most essential safety features were compromised during the storm, the damage was extensive enough that the facility was shut down for six months following the disaster. Hurricane Andrew exposed the vulnerability of coastal nuclear plants, particularly those in hurricane-prone regions of the country.

### Turkey Point Expansion

Next year, Florida's Turkey Point nuclear plant will celebrate its 40th birthday and is set to operate until at least 2032. It may also be expanding. In 2009, FPL submitted an [application](#) to build two new reactors on the same property.

The planned reactors at Turkey Point are among [28 new ones](#) the NRC is currently reviewing for construction nationwide. It's been 30 years since a nuclear plant was built in the U.S., but in recent years nuclear power has become a popular energy choice among policy makers who want to lower America's greenhouse gas emissions. For proponents of the nuclear industry, nuclear power is an existing low-carbon technology that can be implemented as soon as new plants are built. The Obama administration has already

endorsed nuclear power as an important part of the country's plan to move away from fossil fuels, such as coal and natural gas. That position hasn't changed since the Japanese emergency began to unfold.

But because they need a reliable source of water for cooling, nuclear reactors are usually located along the coast, next to a large lake, or adjacent to a major river. And for those near the sea, rising sea levels that go with climate change could prove worrisome. In its 2007 report, the [U.N. Intergovernmental Panel on Climate Change](#) (IPCC) found that global sea levels had been rising since the 1930s. The IPCC also found that today, on average, ocean levels are creeping upwards about 1.2 inches every decade.

That might not sound like a lot, especially when nuclear plants are built 20 or 30 feet above sea level. But rising sea levels also raise the baseline level upon which storm surges are built. So what might once have been a nonthreatening storm surge can become a distinct danger.

"With sea-level rise, it's not the slow creeping that's the problem. It's the fact that with storms and other extreme events you push more water farther inland, which can create real problems," says environmental historian [John Perkins](#) from [Evergreen State College](#) in Olympia, WA., who has recently been studying the impacts that climate change may have on nuclear plants in the U.S..

In a 2008 study with graduate student [Natalie Kopytko](#), Perkins specifically assessed what risks sea level rise posed for nine reactors along the East and West Coasts. Their findings, Perkins says, show that sea level rise isn't only important in terms of long term changes at the shoreline adjacent to nuclear plants. "[Kopytko] showed it was storms that were really behind the risk. These are U.S. coastal reactors, and hurricanes can pile an awful lot of water in front of them."

In their study, Perkins and Kopytko used estimates of future sea level to calculate how much water might encroach upon nuclear plants. They found that

the plants in the U.S. were all built high enough to withstand sea level rise alone over the next 50 years (which goes beyond the expected operating lifetime of the current plants). But they also discovered that with the IPCC's expected rate of sea level rise, storm surges from Category 4 or 5 hurricanes will completely inundate the nuclear plants within their projected lifetimes. Their findings were [published](#) in the January 2011 issue of the journal Energy Policy.

As sea levels continue to rise, scientists say the storm surges of these hurricanes will get even larger. Worse yet, climate scientists now believe that while Atlantic hurricanes may become less frequent later this century, they're likely to get more powerful on average.

The NRC says it considers these factors when assessing the safety of nuclear plants, and that the existing facilities at Turkey Point, in particular, are capable of withstanding future storms, as proven by the experience with Hurricane Andrew.

"We currently have models for all the nuclear facilities that exist, and those do take into account the expected levels of flood and storm surges," says the NRC's Hannah.

A New "Worst-Case Scenario"?

Following the 2004 tsunami in the Indian Ocean, which was particularly devastating to Indonesia, the NRC reviewed its estimates of how big a threat storm surges could be to U.S. coastal nuclear facilities -- but ultimately decided not to change the way they calculate the "worst-case" scenario at each location.

"I expect they will revisit this again, following the Japanese emergency," says [David Lochbaum](#), a nuclear analyst from the [Union of Concerned Scientists](#). "... But considering they didn't change their policy after 2004, I don't anticipate they will change their predictions this time either."

When it comes to figuring just how much sea level rise could affect the

proposed new plants, which could have at least 100-year lifetimes from beginning of construction to complete decommissioning, Hannah says, "we look at the expectations for effects in the area in the future, and that includes storm surges."

During its [safety assessment](#) for the new reactors' applications at Turkey Point, FPL has modeled a worst-case scenario, based on what they estimate to be the highest tide conditions paired with the worst potential hurricane to strike the area -- plus an additional 10 percent for an extra margin of safety. Based on these estimates, FPL predicts the maximum storm surge at the location of the new Turkey Point reactors would likely be no higher than 24.8 feet, which is 1.2 feet below the plant's safety facilities.

In particular, these calculations of a likely maximum storm surge include an estimate that sea level could rise by between 0.78 and 1 foot in Biscayne Bay during the next century. This rate of sea level rise was based on observations taken at a nearby NOAA tide gauge between the years 1931 and 1981 and then extrapolated forward. Scientists, however, have observed that in recent decades the rate of sea level rise has been accelerating. According to a Climate Central analysis of sea level rise in the same region, but based on readings for the most recent 30-year period, the rate of sea level rise around Turkey Point is already about 15 percent higher, or about 1.1 feet-per-century, than what FPL used in its assessment. Consequently, FPL's assessment that Turkey Point can withstand a worst-case scenario storm might fall short.

There is already a growing consensus among scientists that the rate of sea level rise is higher than the IPCC estimated in their 2007 report. For example, a [2010 report from the National Academy of Sciences](#) confirmed that the future rate of sea level rise may actually be higher than that projected by the 2007 IPCC assessment, because that report didn't take into account future ice losses from Greenland and Antarctica. Consequently, FPL has likely failed to account for how much sea level will rise at Turkey Point in the next 100 years. Because these rates of sea level rise are included in the calculations of how

large storm surges could be at Turkey Point, FPL may also be underestimating their "worst-case scenario."

Greenland holds enough ice to raise sea level 23 feet. That won't happen by 2100, but scientists now say that Greenland will probably contribute to more sea level rise than the IPCC predicted in their 2007 report.

Scientists have already recommended that major coastal installations, including industrial plants and naval bases, prepare for more sea level rise in the next century than what FPL has estimated. For example, in a [new report on sea level rise](#), the Academy recommends that the Navy prepare for an average of 2.6 feet of sea level rise by 2100. That report also emphasized the threat posed by storm surge-related flooding, rather than the increase in baseline sea levels.

The extent of sea level rise that FPL has incorporated into their estimates of the maximum possible storm surge has already become a point of contention in the safety assessment for the new Turkey Point reactors. The [Miami-Dade County Climate Change Advisory Task Force](#) (CCATF) has called for the NRC to request that a much higher level of sea level rise be included in the assessment.

In support of a petition against FPL's proposal to build the two new reactors at Turkey Point, University of Miami geologist Harold Wanless has [testified](#) on behalf of the Miami-Dade CCATF that:

"With what is happening in the Arctic and Greenland, many respected scientists now see a likely sea level rise of at least 1.5 feet in the coming 50 years and a total of at least three to five feet by the end of the century, possibly significantly more."

[Wanless](#), who also chairs Miami-Dade's climate change task force, further testified that "incorporating [realistic] future sea level changes will change the



safety and structural integrity of the complex during major storms."

Currently the safety assessment for the new Turkey Point reactors is still under review and the NRC has not authorized the construction of the new reactors. However, the UCS's Lochbaum doesn't expect that the NRC will change its policies to demand a higher estimate of sea level rise be incorporated into maximum storm surge calculations.

"Thus far, the NRC has been looking backwards in terms of predicting changes [to sea level rise]," he explained, "And if they've been doing that for 30 years, I don't anticipate they'll change that soon."

This article was provided by OnEarth partner [Climate Central](#).

#### POSSIBILITY OF TURKEY POINT 3 & 4 TAKING OUT 6 & 7

The events at Fukushima make the potential impact of the inundation of Turkey Point 3 & 4 on the operation of the proposed Turkey Point 6 & 7. As was seen in Fukushima, circumstances combined to make the generators fail bringing the whole complex down. According to FPL's website information, Turkey Point Safety Information System Information, Milestones(<http://www.fpl.com/environment/nuclear/pdf/turkeypoint.pdf> (Turkey Point 4 & 4 were constructed to withstand earthquakes: The plant is designed to withstand earthquakes and other natural events stronger than ever recorded in the region. Protected from flooding: The plant is elevated 20 feet above sea level to protect against flooding and extreme storm surges. One must ask: is 20 feet high enough to assure that Turkey Point 3 & 4 will not be taken out and create problems for Turkey Point 6 & 7. The storm surge at Turkey Point during Hurricane Andrew was less than 6 feet so there was not true test of the strength and reliability of Turkey Point 3 & 4 in 1992. Fukushima showed us what can happen when systems fail affecting several reactors in a complex. On Monday, 28 March Nuclear Power Plants website ( [nuclear-powerplants.blogspot.com/.../fukushima-i-nuclear-reactor-accidents.html](http://nuclear-powerplants.blogspot.com/.../fukushima-i-nuclear-reactor-accidents.html) - [Cached](#)) reported:

"High levels of radiation from contaminated water hindered work on restoring the cooling pumps and other powered systems to reactors 1-4. The Japanese Nuclear Safety Commission reported that it assumed melted fuel rods in Unit 2 released radioactive substances into cooling water which subsequently leaked

out through an unknown route to the Unit 2 turbine building basement.

In hopes of reducing the amount of water leaking, TEPCO reduced the amount of water pumped into Reactor 2 from 16 tons per hour to 7 tons per hour, despite the priority of cooling the reactor core. Confirming concerns, the temperature in the reactor raised by 20°C. Highly radioactive water was also found in three "trenches" (tunnels that house electrical wires from the turbines) which stretch toward, but do not connect to, the sea. Water levels in trenches of Units 2 and 3 were 1m below the level at which they would overflow to the sea, while the Unit 1 trench was 10cm from overflowing. TEPCO reported they used sandbags and concrete to prevent an overflow at the opening of the tunnel.

TEPCO confirmed finding low levels of plutonium in five samples from 21 March and 22 March, concluding that "two samples out of five may be the direct result of the recent incident."

## **The loss of engineered safety features**

NUREG 0396 (page III-7 to III-8) states:

The loss of either some or all engineered safety features are postulated in Class 9 accidents. If the engineered safety features are lost during an accident, then the LPZ has no meaning with regard to the size of the areas around the plant in which emergency response would be appropriate.

Clearly the Station Blackout event at the Fukushima Daichi site in Japan demonstrates the loss of engineered safety features is possible and the CASE contentions on emergency planning and evacuation should be heard in full.

---

## **CONCLUSION**

It is CASE's position that Contentions 1,2 and 5, as related to safety, evacuation, distribution of potassium iodide, and the impact of storm surges and climate change should be revisited as well as every NRC and industry nuclear plan and system now in place regarding the public's safety. All FEMA, State and Local plans for timely evacuation, for the pre-placement of potassium

iodide, for the predictions of reliable and credible scientists regarding sea level rise and storm surge, should be re-built from the ground up. And, if as CASE suspects, one or more of these areas cannot be adequately allowed for at Turkey Point, no license should be issued, ever, for Turkey Point 6 & 7, and even plans for increased power for Turkey Point 3 & 4 should be re-analyzed. No one wants to be in the current position of the Japanese nuclear regulatory authorities who did not, and maybe could not have, allowed for such a catastrophic series of events. Forewarned is forearmed. It behooves all responsible administrators world wide to learn from Fukushima; Germany has shut down several of its reactors and seems committed to eliminating nuclear energy totally from the nation. ([www.upi.com/.../Germany...shut-down...reactors/UPI-52431300208122/](http://www.upi.com/.../Germany...shut-down...reactors/UPI-52431300208122/) - [Cached](#)). Such a pause and indepth analysis seems prudent for our nation as well.

#### Sounds Of Silence

This past weekend 10,000 college students gathered in Washington, D.C. at the Convention Center for the Powershift 2011 Conference focused on calling the attention of the U.S. Chamber Of Commerce to the reality and presence of climate change, climate change as presented in Contention 5 of this petition.

But, since Simon and Garfunkel wrote these words in 1964,

And in the naked light I saw  
Ten thousand people, maybe more  
People talking without speaking  
People hearing without listening  
People writing songs that voices never share  
And no one dared  
Disturb the sound of silence

nothing seems to have changed. Did anyone outside of the Convention Center hear their message, their angst, their concern? Did anyone read Dr. Wanless's Climate Change Study submitted with the Revised Petition and realize that there is a clear and present threat to life as we know it in South Florida and on this entire planet? Or is it people talking and no one is listening?

On April 14, 2011 CASE was one of 45 organizations and individuals to file this petition on the EIE system for the NRC:

**EMERGENCY PETITION TO SUSPEND ALL PENDING REACTOR LICENSING**

DECISIONS AND RELATED RULEMAKING DECISIONS PENDING  
INVESTIGATION OF LESSONS LEARNED FROM FUKUSHIMA DAIICHI  
NUCLEAR POWER STATION ACCIDENT

At age 73, this writer has spent most of the last year and a half on the quest to keep Turkey Point 6 & 7 from being licensed, advocating the use of renewable energy and distributed, decentralized production of energy, as well energy conservation and efficiency. Living less than twenty five miles from Turkey Point for the last 42 years, learning to love and appreciate the unique and fragile spit of land we live on and the dangers to its precarious ecological balance, it was encouraging to see so many people from all over the nation coming together last Thursday to present this focused statement of concern and pleading to our governmental authorities, a plea for rationality and sanity where they seem to be lacking in decisions which seem to be driven by economics and politics instead of concern for the public welfare. A CASE member and activist, grew up seven miles from Turkey Point. She had thyroid cancer, treated successfully, which is really no surprise since the Florida Department of Health statistics show a 25% greater incidence of thyroid cancer in Miami Dade, Broward and Palm Beach Counties over the rest of the State of Florida and over the national average. The judgments and decisions of authorities over 500 miles away in Tallahassee and over 1000 miles away in Washington, D.C. are more than writings on paper; they affect real people and actual land, water, flora and fauna. And their grandchildren. "The words of the prophets are written on the subway walls , and tenement halls." And in petitions before the NRC.

One underlying message of the Fukushima experience is that, in the time of an actual emergency plans on paper are not always followed as written and that judgement, decisions and circumstances each have a dynamic of their own. Also, planning is 90% of everything. Most ventures, be they governmental, business, military or personal, fail or do not achieve their goals or potential due to lack of thorough and exhaustive planning. We would hope that a new level of planning can become a goal for the NRC and the nuclear industry. However, it is CASE's contention that the best course of action is to avoid the situation entirely by not putting people, the land and water, and our food supply in harms way. Do not create a potentially harmful situation in the first place. Do not put new reactors at Turkey Point.

---

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD PANEL

Before the Licensing Board:

E. Roy Hawkens, Chair  
Dr. Michael F. Kennedy  
Dr. William C. Burnett

In the Matter of )  
 ) Docket No. 52-040 and 52-041  
Florida Power & Light Company )  
 )  
Combined License Application for )  
Turkey Point Units 6 & 7 ) April 18, 2011  
\_\_\_\_\_ )

**CERTIFICATE OF SERVICE**

I, BARRY J. WHITE, hereby certify that copies of the foregoing was served upon the following persons by Electronic Information Exchange and/or electronic mail.

U.S. Nuclear Regulatory  
Commission  
Atomic Safety and Licensing Board  
Panel  
Mail Stop: T-3 F23  
Washington, DC 20555-0001  
Joshua Kirstein, Law Clerk, ALSB  
Email: [josh.kirstein@nrc.gov](mailto:josh.kirstein@nrc.gov)

E. Roy Hawkens  
Administrative Judge, Chair  
Email: [roy.hawkens@nrc.gov](mailto:roy.hawkens@nrc.gov)

Dr. Michael F. Kennedy  
Administrative Judge  
Email: [michael.kennedy@nrc.gov](mailto:michael.kennedy@nrc.gov)

Dr. William C. Burnett  
Administrative Judge  
Email: [william.burnett2@nrc.gov](mailto:william.burnett2@nrc.gov)

U.S. Nuclear Regulatory  
Commission  
Office of the General Counsel  
Mail Stop: 0-15 D21  
Washington, DC 20555-0001  
Marian Zabler, Esq.  
Sara Kirkwood, Esq.  
Patrick Moulding, Esq.  
Sara Price, Esq.  
Joseph Gilman, Paralegal  
Karin Francis, Paralegal  
Email: [marian.zabler@nrc.gov](mailto:marian.zabler@nrc.gov);  
[sara.kirkwood@nrc.gov](mailto:sara.kirkwood@nrc.gov);  
[patrick.moulding@nrc.gov](mailto:patrick.moulding@nrc.gov);  
[sara.price@nrc.gov](mailto:sara.price@nrc.gov);  
[joseph.gilman@nrc.gov](mailto:joseph.gilman@nrc.gov);  
[karin.francis@nrc.gov](mailto:karin.francis@nrc.gov)

U.S. Nuclear Regulatory  
Commission  
Office of Commission Appellate  
Adjudication

Mail Stop: 0-7H4M  
Washington, DC 20555-0001  
Email: [ocaamail@nrc.gov](mailto:ocaamail@nrc.gov)

OGC Mail Center: Members of this office have received a copy of this filing by EIE service.

Florida Power & Light Company  
700 Universe Blvd.  
Juno Beach, Florida 33408  
Mitchell S. Ross  
Vice President & General Counsel – Nuclear  
Email: [mitch.ross@fpl.com](mailto:mitch.ross@fpl.com)

Florida Power & Light Company  
801 Pennsylvania Ave. NW Suite 220  
Washington, DC 20004  
Steven C. Hamrick, Esq.  
Mitchell S. Ross  
Email: [steven.hamrick@fpl.com](mailto:steven.hamrick@fpl.com);  
[mitchell.ross@fpl.com](mailto:mitchell.ross@fpl.com)

Counsel for the Applicant  
Pillsbury, Winthrop, Shaw, Pittman, LLP  
2300 N Street, N.W.  
Washington, DC 20037-1122  
Alison M. Crane, Esq.  
Stefanie Nelson George, Esq.  
John H. O'Neill, Esq.  
Matias F. Travieso-Diaz, Esq.  
Maria Webb, Paralegal  
Email: [alison.crane@pillsburylaw.com](mailto:alison.crane@pillsburylaw.com);  
[stephanie.george@pillsburylaw.com](mailto:stephanie.george@pillsburylaw.com);  
[john.oneill@pillsburylaw.com](mailto:john.oneill@pillsburylaw.com);  
[matias.travieso-diaz@pillsburylaw.com](mailto:matias.travieso-diaz@pillsburylaw.com);  
[maria.webb@pillsburylaw.com](mailto:maria.webb@pillsburylaw.com);  
Counsel for Mark Oncavage, Dan Kipnis, Southern Alliance for Clean Energy and National Parks Conservation

Association Turner Environmental Law Clinic Emory University School of Law  
1301 Clifton Rd. SE  
Atlanta, GA 30322  
Lawrence D. Sanders, Esq.  
Mindy Goldstein, Esq.  
Email: [lsande3@emory.edu](mailto:lsande3@emory.edu);  
[magolds@emory.edu](mailto:magolds@emory.edu)

Counsel for Mark Oncavage, Dan Kipnis,  
Southern Alliance for Clean Energy and National Parks Conservation Association  
Everglades Law Center, Inc.  
3305 College Avenue  
Ft. Lauderdale, Florida 33314  
Richard Grosso, Esq.  
Email: [richard@evergladeslaw.org](mailto:richard@evergladeslaw.org)

Counsel for the Village of Pinecrest  
Nabors, Giblin & Nickerson, P.A.  
1500 Mahan Drive, Suite 200  
Tallahassee, FL 32308  
William C. Garner, Esq.  
Gregory T. Stewart, Esq.  
Email: [bgarner@ngnlaw.com](mailto:bgarner@ngnlaw.com);  
[gstewart@ngnlaw.com](mailto:gstewart@ngnlaw.com)

Citizens Allied for Safe Energy, Inc.  
10001 SW 129 Terrace  
Miami, FL 33176  
Barry J. White  
Email: [bwtamia@bellsouth.net](mailto:bwtamia@bellsouth.net)

U.S. Nuclear Regulatory Commission  
Office of the Secretary of the Commission  
Mail Stop: O-16C1  
Washington, DC 20555-0001  
Email: [hearingdocket@nrc.gov](mailto:hearingdocket@nrc.gov)

Dated: April 18, 2011

/signed electronically by/  
Barry J. White  
Authorized Representative  
Citizens Allied for Safe Energy, Inc.  
10001 SW 129 Terrace  
Miami, Florida 33176  
Email: [bw](#)