

January 4, 1993

Docket Nos. 50-250  
and 50-251

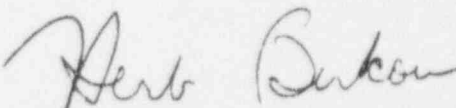
NOTE TO: Jocelyn Mitchell

FROM: Herbert Berkow, PDII-2

SUBJECT: EDO CONTROL NO. 0008388, SUBCOMMITTEE ON NUCLEAR REACTOR REGULATION  
QUESTIONS ON TURKEY POINT

I have revised and enclosed the responses to the three Graham questions on Turkey Point in accordance with the comments which we discussed on December 30. Region II has concurred in these revised responses but I did not send them through the entire concurrence chain again.

If any further clarification or revisions are needed let me know.

  
Herbert Berkow, PDII-2

Enclosure:

cc/w enclosure:

S. Varga  
G. Lainas  
L. Raghavan  
A. Gody

9301060311 XA

N/A

QUESTION 1. It is alleged that the failure to perform the license-required surveillances to verify the operability of the pressure-relief system used to prevent possible vessel cracking constitutes a serious violation of the plant's technical specifications. It cannot be considered to be but a mere deviation as the NRC has chosen to characterize it.

ANSWER.

The licensee's action to depart from the technical specifications (TS)-required surveillance tests was not a failure, but rather a conscious emergency decision and action consistent with the provisions of 10 CFR 50.54(x). The conduct of surveillances during normal and off-normal conditions is required and expected. However, 10 CFR 50.54(x) allows a licensee to "...take reasonable action that departs from a license condition or a technical specification (contained in a license issued under this part) in an emergency when this action is immediately needed to protect the public health and safety and no action consistent with the license conditions and technical specifications that can provide adequate or equivalent protection is immediately apparent." The licensee is expected to exercise good judgment and minimize possible upset situations where feasible. Further, 10 CFR 50.54(y) requires that the "licensee's action permitted by paragraph (x) of this [10 CFR 50.54] section shall be approved, as a minimum, by a licensed senior operator prior to taking the action."

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During August 24 - 25, 1992, after the Turkey Point units were brought to a hot shutdown, the licensee, under the provisions of 10 CFR 50.54(x), decided not to enter the containment and hook up the equipment required to perform the necessary surveillance test procedure. The licensee took this action because the normal lighting in the containment was not available due to loss of offsite power and portable lighting would have been required to perform this surveillance. Entry into containment without normal lighting carried too high a risk of potential human error and injuries, or of resulting in an undesirable plant transient. At the time, the safety importance of the overpressure mitigation system (OMS) was substantially reduced from its design basis because the unit was not in a water-solid condition during or following the hurricane. Also, the high pressure safety injection (HPSI) flow path to the reactor coolant system (RCS) was isolated, as required by the TS under such conditions. The licensee successfully accomplished the control room portion of testing the OMS (i.e., cycling of the power-operated relief valves (PORVs)) within 24 hours of the shutdown of the units). The nitrogen portion of the OMS was tested and declared operational by September 7, 1992, when stable offsite power was restored and normal lighting was available inside containment. The nitrogen is a backup to the instrument air system which normally operates the PORVs. The instrument air system remained operational throughout the entire event.

The NRC staff reviewed the licensee's actions taken during the emergency condition to depart from the TS surveillance noted above and determined that they were immediately needed to protect the public health and safety, no other adequate or equivalent action consistent with license conditions or TS was immediately apparent, and no opportunity existed to process a license amendment. The NRC staff also found the licensee's actions appropriate on the basis that the departure from TS was approved by a licensed senior reactor operator prior to implementation and the licensee took necessary actions to recover from the departure from TS as soon as practicable following the hurricane (i.e., departed from TS only to the extent necessary).

The NRC staff evaluation of this event is documented in Inspection Report 50-250,251/92-20, which was provided to you earlier.

QUESTION 2. Florida Power and Light management failed to perform critical start-up surveillance tests on the reactor coolant system and in the feedwater equipment, leading to an inability to cool down the primary system after the inevitable manual or automatic reactor trip that followed the loss of feedwater from main or nuclear-safety-related auxiliary feedwater and residual heat removal sources.

ANSWER.

The Turkey Point technical specifications (TS) require that each emergency core cooling system (ECCS) component and flow path and the standby feedwater pumps be demonstrated to be operable at least monthly while the units are in Modes 1, 2 or 3. On September 29, 1992, with Unit 4 in Mode 2, the licensee discovered that, contrary to these TS requirements, ECCS pump and piping venting and the standby feedwater pump operability demonstration had not been performed prior to entry into Mode 3. ECCS venting had been last performed on August 7, 1992 and standby feedwater pump operability had been last demonstrated on August 5, 1992.

In response to the discovery of these missed surveillances, the licensee satisfactorily completed them promptly and demonstrated that both the ECCS and the non-safety-related standby feedwater pumps were operable. Further, the licensee returned Unit 4 to Mode 3 and satisfactorily verified that all other required surveillances had been performed. This was independently verified by

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the NRC resident inspectors. During this time the normal feedwater and safety-related auxiliary feedwater remained available. In addition, ECCS pump and piping venting (high head safety injection pump readiness test) showed no evidence of air when venting the piping or pump casing. The licensee also walked down the residual heat removal (RHR) and safety injection systems to verify valve alignment. Prior to entry into Mode 4, cooling of the reactor coolant system (RCS) was provided by an RHR pump which ran normally. It is important to note that there was no reactor trip, nor was there ever any degradation of the ability to cool the primary system under any required condition as a result of these missed surveillances.

The licensee attributed the cause of this event to personnel error, in that the surveillance due dates were improperly changed in the computer, and has implemented corrective measures to require supervisory review and approval of all changes to surveillance dates in the computer. The NRC staff reviewed the licensee's event analyses and actions and determined that the missed surveillances did not result in any health and safety concern and that the licensee's corrective actions were satisfactory. In accordance with NRC enforcement policy, however, a non-cited violation was issued for the licensee's failure to perform TS-required surveillances within the specified time-frames. The NRC staff evaluation is documented in Inspection Report 50-250, 251/92-20, which was provided to you earlier.



QUESTION 3.

On October 5, 1992, with the unit in cold shutdown, the Overpressure Mitigation System was erroneously actuated, with the spurious opening of power operated relief valves, the decreased primary pressure increasing the risk of a spurious safety injection.

ANSWER.

On October 5, 1992, with Unit 4 in cold shutdown, the licensee was performing an overpressure mitigation system (OMS) nitrogen backup leak and functional test. The test requires preparation of the primary coolant loop such as to allow opening of the power-operated relief valves (PORVs) without depressurization of the reactor coolant system (RCS) and to provide a closure signal to the residual heat removal (RHR) system suction valves. The test is accomplished by introducing a simulated high pressure signal to the primary coolant loop instrumentation being tested and verifying that the loop instrumentation operates as designed. In performing the test, licensee personnel erroneously proceeded to apply the simulated high pressure signal to a backup instrumentation loop instead of the primary loop. The backup is a parallel loop which is identical in operation and configuration to the primary loop. Since the backup loop was not prepared for the test, application of the test pressure resulted in a slight depressurization of the RCS, approximately 12 psig, which is insignificant compared with the pressure decrease required to trigger a safety injection, before the error was discovered and the PORV in

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the backup loop was closed. The reduction in pressure also caused a valve in the RHR system, which was kept open for the test, to close. This resulted in a brief loss of RHR cooling and a 1 degree F increase in the RCS temperature. After the event, the PORV was closed and the RHR system was returned to normal operation in a timely manner. No high system pressure actually occurred as a result of the inadvertent actuation of the PORV and the OMS and RHR systems functioned as expected. Further, although spurious safety injections should be avoided, the systems are designed for such events and, should a safety injection have occurred, this would not have posed a health and safety concern. The licensee has implemented appropriate corrective actions to prevent recurrence of such an event.

The NRC staff evaluation of this event is documented in Inspection Report 50-250,251/92-24, which was provided to you earlier. As noted in the inspection report, a non-cited violation was issued, in accordance with NRC enforcement policy, for the licensee's failure to follow procedures, which resulted in the inadvertent opening of a PORV.

QUESTION 1. It is alleged that the failure to perform the [redacted] - required surveillances to verify the operability of the pressure-relief system used to prevent possible [redacted] cracking constitutes a serious violation of the plant's technical specifications. It cannot be considered to be but a mere deviation as the NRC has chosen to characterize it.

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The NRC staff reviewed the licensee's actions taken during the emergency condition to depart from the TS surveillance noted above and determined that they were immediately needed to protect the public health and safety, <sup>and</sup> no other adequate or equivalent action consistent with license conditions or TS was immediately apparent, ~~and no opportunity existed to process a license amendment.~~ The NRC staff also found the licensee's actions appropriate on the basis that the departure from TS was approved by a licensed senior reactor operator prior to implementation and the licensee took necessary actions to recover from the departure from TS as soon as practicable following the hurricane (i.e., departed from TS only to the extent necessary).

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The licensee attributed the cause of this event to personnel error, in that the surveillance due dates were improperly changed in the computer, and has implemented corrective measures to require supervisory review and approval of all changes to surveillance dates in the computer. The NRC staff reviewed the licensee's event analyses and actions and determined that the missed surveillances did not result in any health and safety concern and that the licensee's corrective actions were satisfactory. In accordance with NRC enforcement policy, however, a non-cited violation was issued for the licensee's failure to perform TS-required surveillances within the specified time-frames. The NRC staff evaluation is documented in Inspection Report 50-250, 251/92-20, which was provided to you earlier.



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On October 5, 1992, with the unit in cold shutdown, the Overpressure Mitigation System was erroneously actuated, with the spurious opening of power operated relief valves, the decreased primary pressure increasing the risk of a spurious safety injection.

ANSWER -

On October 5, 1992, with Unit 4 in cold shutdown, the licensee was performing an overpressure mitigation system (OMS) nitrogen backup leak and functional test. The test requires preparation of the primary coolant loop such as to allow opening of the power-operated relief valves (PORVs) without depressurization of the reactor coolant system (RCS) and to provide a closure signal to the residual heat removal (RHR) system suction valves. The test is accomplished by introducing a simulated high pressure signal to the primary coolant loop instrumentation being tested and verifying that the loop instrumentation operates as designed. In performing the test, licensee personnel erroneously proceeded to apply the simulated high pressure signal to a backup instrumentation loop instead of the primary loop. The backup is a parallel loop which is identical in operation and configuration to the primary loop. Since the backup loop was not prepared for the test, application of the test pressure resulted in a slight depressurization of the RCS, approximately 12 psig, ~~which is insignificant compared with the pressure decrease required to trigger a safety injection, before the error was discovered and the PORV in~~

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The simulated high RCS pressure signal  
~~the backup loop was closed.~~ Suction ~~The reduction in pressure also~~ caused a valve in the RHR system, ~~which was kept open for the test,~~ to close. This resulted in a brief loss of RHR cooling and a 1 degree F increase in the RCS temperature. After the event, the PORV was closed and the RHR system was returned to normal operation in a timely manner. No high system pressure actually occurred as a result of the inadvertent actuation of the PORV and the OMS and RHR systems functioned as expected. Further, although spurious safety injections should be avoided, the systems are designed for such events and, should a safety injection have occurred, this would not have posed a health and safety concern. The licensee successfully completed the test and has implemented appropriate corrective actions to prevent recurrence of inadvertent actuation of OMS ~~such an event.~~

The NRC staff evaluation of this event is documented in Inspection Report 50-250,251/92-24, which was provided to you earlier. As noted in the inspection report, a non-cited violation was issued, in accordance with NRC enforcement policy, for the licensee's failure to follow procedures, which resulted in the inadvertent opening of a PORV.

With the plant in cold shutdown at approximately 350 psig, a spurious safety injection <sup>(SI)</sup> would not have occurred because, by procedure, the SI signal was blocked ~~by the SI pumps~~ ~~these pumps~~ and the SI flow path was isolated.

The Honorable Bob Graham  
United States Senator  
P.O. Box 3050  
Tallahassee, FL 32315

Attention: Becky Liner

Dear Senator Graham:

The enclosure is our response to the questions on Turkey Point which your constituents asked in a letter to your office dated September 12, 1992, concerning Hurricane Andrew's impact on the nuclear plants. Previously, on October 21, 1992, we briefed your staff and on November 6, 1992, provided additional information concerning certain other Hurricane-Andrew related questions which other of your constituents asked in their letter dated September 23, 1992.

I trust that this information will assist you in responding to the requests of your constituents.

Sincerely,

James M. Taylor  
Executive Director for Operations

Enclosure:  
As stated

DISTRIBUTION:

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*n/9*

QUESTION: TURKEY POINT

*We didn't answer the question directly. The answer is - they weren't designed to survive a hurricane the strength of Andrew!*

Why did several systems important to the health and safety of the public (such as fire protection, security/surveillance, radiation monitoring, warning sirens and communications) fail during the Hurricane? Have these systems been reestablished?

Hurricane Andrew hit south Florida with sustained surface winds of up to 145 miles per hour (mph) per the National Hurricane Center estimate. Several unofficial reports estimate stronger gusts. The eye of the storm passed over the site and caused significant onsite and offsite damage. However, the nuclear portion of both units, that is the portions that could pose a radiological hazard to the public if they failed, were not damaged. Prior to the advent of the storm, the licensee, in accordance with its emergency planning procedures, brought the Units to a hot shutdown (Mode 4) and the units remained in a stable condition. There was no release of radiation to the environment.

Following completion of the storm damage repairs to the Turkey Point Unit 4 and common systems, the licensee restarted Unit 4 on September 29, 1992. Storm damage repairs to the Turkey Point Unit 3 are being implemented during its ongoing Cycle 13 refueling outage. Unit 3 is expected to resume its power operation by November 25, 1992.

*No mention of shutdown of shutdown to resolve EP issue. The shutdown should be added or note if deleted.*

The storm included damage to the fire protection, security / surveillance, radiation monitoring, warning sirens, and communications systems. The storm also caused loss offsite power. Following the storm, the licensee either restored the specific functions of these systems or implemented appropriate alternate means to meet their functions. Each of these systems is discussed below:

Fire Protection System

As a result of the hurricane winds the service water system high water storage tank collapsed and caused damage to the fire protection system. Within a few hours following the hurricane, the licensee established 30-minute roving fire watch patrols with the available personnel and by August 31, 1992, when qualified fire watch personnel became available, established Technical Specifications (TS)-required fire watches. By 5:20 p.m. on August 27, 1992, the licensee established a backup fire water capability which met the TS requirements. Prior to restart of Turkey Point Unit 4, the licensee implemented an interim fire protection configuration with backup water and backup pump capabilities. The licensee performed a safety evaluation of this interim configuration and satisfactorily demonstrated compliance with Appendix R to 10 CFR 50 and TS requirements. On October 5-9, 1992, the NRC staff inspected and verified the licensee's implementation of the plant's fire protection/prevention program including the interim fire protection system configuration. The licensee restored the fire protection system to its design basis configuration by November 15, 1992. To prevent any future damage of these types to the fire protection system, the licensee has eliminated the service water high water storage tank.

SGC

### Security/Surveillance

The storm caused damage to security buildings which were constructed to withstand 120 mph winds. The Intrusion Detection and Surveillance (IDS) System remained operational until the cameras or intrusion equipment also sustained damage due to the storm. At least nine protected area barriers were also damaged. Within a few hours after the storm, the licensee assessed the damage and deployed security personnel to secure the site and establish personnel and material access controls. Subsequently, the licensee re-established the Secondary Alarm Station (SAS) as its command and control facility. Armed security officers were positioned in the Auxiliary Building which would have been the most direct passage to containment. At the conclusion of the storm, security personnel were deployed in and around the protected and vital area. During subsequent searches of the protected and vital areas, there were no indications of site penetration during the storm.

OK

The full regulatory acceptable security system was established by the licensee on September 22, 1992. Security measures were reviewed and found acceptable by the NRC Region II Safeguards Inspectors on September 23-25, 1992.

### Radiation Monitoring

deployed to monitor direct radiation levels

Radiation monitoring is performed by 21 direct radiation monitors, specifically, thermoluminescent dosimeters (TLD) and 5 air samplers. The TLDs were secured to various appurtenances, such as trees and poles. Many of the trees were destroyed by the hurricane. Four air sampling stations and several TLDs surrounding the plant were destroyed during the storm. During and after the storm, direct radiation levels were monitored by 13 of the 21 environmental TLDs, required by IS which were recovered. In addition, approximately 52 of 76 TLDs located within the licensee's radiologically controlled area (RCA) and protected area boundaries also remained functional to monitor any potential releases from the plant. Preliminary results of radiological environmental samples, e.g. broad leaf vegetation, water, soil and sediments, which were collected on September 9, 1992, indicated no abnormal readings.

The licensee contracted with the State of Florida to conduct the radiological environmental monitoring program. The State initiated sample recovery and damage estimates for the program on September 2, 1992. Restoration and replacement of equipment was initiated on September 9, 1992. All TLDs and air monitoring equipment were replaced and determined to be operable by September 14 and September 19, 1992, respectively.

To aid recovery in the event of a future hurricane, the licensee plans to attach the TLDs to the warning siren poles which may better withstand the hurricane forces.

RFB  
what about poles  
which were  
destroyed?

Why say this?  
The siren poles are  
not hurricane proof and  
don't some of them  
also get blown down?

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## Warning Sirens

Many of the sirens, towers, and repeaters became inoperable during the hurricane. Although the exact time at which the licensee became aware of the degraded condition of the siren system is not known, the licensee assumed complete system disablement and initiated restoration activities as soon as access roads were cleared. Full siren system restoration and system testing was accomplished by September 21, 1992.

The State of Florida Radiological Emergency Plan for Nuclear Power Plants recognizes the possibility that the sirens may become inoperable. Because of this possibility, an alternate means of notification is preplanned in the State's Emergency Plan. This alternate means consists of "route alerting" the population within the area of interest. The route alerting is performed by backup police, fire rescue, and/or airplanes with loudspeakers, notifying the population to take the necessary actions.

*← This at least implies the "alternate means" survived the storm. The whole purpose of the FEH is to address the question of related availability of alternate means.*

## Communications

Sustained hurricane winds caused damage to transmission lines, antennas and transmitters. The communications systems that operated on the Southern Bell aerial copper wire along Palm Drive failed due to fallen trees and other foreign objects from high velocity winds. Following the storm, the licensee reestablished communications, on an intermittent basis, with portable transceivers and security station cellular telephones which were functional after the storm. Continuous communications were established by the afternoon of August 24, 1992.

Since the hurricane, the communications systems that relied on the Southern Bell aerial copper wire have been replaced by a buried fiber optic cable along Palm Drive. In addition, the licensee has installed two new high frequency radio systems to facilitate communications between the plant and offsite. These communications systems are designed with antennas to withstand winds in excess of 170 miles per hour. Spare antennas are also available onsite to ensure prompt replacement, if needed.

## Offsite Power

The storm caused damage to transmission lines and switchyard equipment which resulted in loss of offsite power. Offsite power was established to the fossil fuel-fired units startup transformers at 6:35 p.m. on August 29, 1992. However, power was not brought onto the nuclear side until the reliability of the offsite power sources was verified. One vital bus each for Unit 3 and Unit 4 was energized from offsite power on August 30. A second source of offsite power was available on September 2, 1992.

The Turkey Point plants are designed with four (two per unit) emergency diesel generators (EDGs) such that they receive an automatic start signal immediately on sensing a loss of load from the offsite power supply buses. Only one EDG



per unit is required to provide emergency power. In addition, the four EDGs can be cross-tied, if necessary, to provide emergency power to the other unit. Once the diesel motor and generator are running at the proper speed (rpm) the load sequencer automatically sequences the various safety-related loads to the generator. The EDGs and sequencers worked as designed. The licensee, in preparation for the storm, tested the EDGs and verified that all fuel tanks were full prior to the onset of the storm. The available fuel exceeded TS requirements. None of the safety-related EDGs suffered any damage from the storm since they are housed in seismic Category 1 designed steel reinforced concrete structures.

Is it credible to think that the Hurricane impacted population could have been evacuated during, or after, the storm if there was a nuclear accident at Turkey Point?

The potential for the situation at Turkey Point to deteriorate further in the aftermath of the damage done by Hurricane Andrew was minimal, although the potential hypothetically did exist. NRC officials, who were closely monitoring plant conditions on a 24-hour basis, believed there was no significant radiological risk to the public during or after the storm.

*This may be true given the extraordinary conditions but it seems like we are making light of a serious event.*

During the time of the hurricane and during the time period that the site was without offsite power, the plants were in Mode 4 ("Hot Shutdown") as required by emergency plan implementing procedures and, therefore, not operating. The plants were placed in "Cold Shutdown", or Mode 5, as follows:

→ *Not sure this is a true statement?* at 5:05 p.m. on August 25, for Unit 3; and at 10:15 a.m. on August 26, for Unit 4.

*I thought there would be service water problem due to debris?*

Emergency diesel generators provided power to the vital emergency equipment throughout the event, as designed, in a fully reliable manner. Offsite power was restored to the nuclear units on August 30, 1992.

The ten-mile emergency preparedness zone (EPZ) was largely evacuated during the first few days after Hurricane Andrew although some residents began to re-enter the zone during the period. The state and local counties would have been called upon to implement their in-place and previously exercised emergency plans if a radiological emergency had occurred in order to protect public health and safety. Where elements of offsite emergency preparedness plans had been compromised, the state and local counties may have required additional Federal and state assistance in order to assure that adequate compensatory measures could have been implemented for protection of public safety. Prior to the hurricane, an evacuation order covering over 99% of the population in the EPZ, was issued by Dade and Monroe Counties. As the main thoroughfares leading out of the EPZ remained passable following the hurricane, it is believed that the population, which did not evacuate, had the ability to do so if the need arose. We should note that Turkey Point had entered mode 4 (hot shutdown) prior to the arrival of the hurricane.

*by the storm*

*measures normal*

*The previous exercised plans were not*

*This seems like a reach.*

DRAFT - PREDECISIONAL

*is so to minimize the likelihood of a*

radiological release, due to a nuclear accident. ~~from the plant with the plant in mode 4, is not considered likely.~~ ?

If not, should we replace the power supplied by Turkey Point with alternative sources of energy?

A response to this question, prepared by Florida Power & Light, is attached.

Finally, who is investigating the environmental impact of the oil spill that occurred at Turkey Point during the Hurricane?

A response to this question, prepared by Florida Power & Light, is attached.

DRAFT - ~~PREDECISIONAL~~





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

The Honorable E. Clay Shaw, Jr.  
United States House of Representatives  
Washington, D.C. 20515

Dear Congressman Shaw:

I am <sup>responding</sup> ~~pleased to respond~~ to your letter of March 21, 1989, in which you enclosed four letters from your constituents that expressed concern regarding operations at the Turkey Point power plant. The four letters requested that the Turkey Point plant be closed until correction of all defects, proper training of employees, and proper inspection are completed at the plant.

~~The concern over Turkey Point's operation is understandable. The operation at the facility historically has not been good. NRC recognized this in the early 1980's and stepped up its inspection and oversight activities, which resulted in several fines, a series of orders requiring improvements, and a number of high-level management meetings with the licensee. NRC monitoring of the site was increased by assigning more inspectors and paying special attention to the operating data from the plant. In early 1984, the licensee, Florida Power and Light Company (FPL), committed to a major improvement effort called the Performance Enhancement Program (PEP). Since that time, FPL has spent several hundred million dollars to improve plant equipment and performance. These improvements already implemented include:~~ <sup>that there were problems at Turkey Point</sup> <sup>This effort</sup> <sup>have been</sup> <sup>and are effective.</sup>

- (1) addition of a training facility that includes a control room simulator
- (2) addition of a health physics facility
- (3) addition of an administration building
- (4) addition of a nuclear maintenance facility
- (5) numerous walkdown inspections of equipment and piping
- (6) a significant staffing increase at the Turkey Point site
- (7) replacement of steam generators
- (8) an overhaul of plant procedures (continuing)
- (9) addition of two emergency feedwater pumps
- (10) addition of five backup diesel generators
- (11) a number of programs to improve the plant design and equipment surveillances

N, 10

2/11

Note to Frank Engel: <sup>10E1</sup>

This is another urgent Turkey Point document. We learned yesterday that it is due on 11/20 rather than 11/27. I would

appreciate your review and concurrence on the substance of those portions of the response which fall into your area by COB 11/18. Verbal notification to L. Raganan is adequate.

Note that there may be some minor word changes by the Tech Editor.

I appreciate your help.

Herb Berkman

11/18/92

P II George Kuzo

HP Inspector on site  
after storm

11/18/92

11:30 AM  
version



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

The Honorable Bob Graham  
United States Senator  
P.O. Box 3050  
Tallahassee, FL 32315

Attention: Becky Liner

Dear Senator Graham:

The enclosure is our response to the questions on Turkey Point which your constituents asked in a letter to your office dated September 12, 1992, concerning Hurricane Andrew's impact on the nuclear plants. Previously, on October 21, 1992, we briefed your staff and on November 6, 1992, provided additional information concerning certain other Hurricane-Andrew related questions which other of your constituents asked in their letter dated September 23, 1992.

I trust that this information will assist you in responding to the requests of your constituents.

Sincerely,

James M. Taylor  
Executive Director for Operations

Enclosure:  
As stated

DRAFT ~~PREDECISIONAL~~

The Honorable Bob Graham  
United States Senator  
P.O. Box 3050  
Tallahassee, FL 32315

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DRAFT - ~~PREDECISIONAL~~

QUESTION: TURKEY POINT

Why did several systems important to the health and safety of the public (such as fire protection, security/surveillance, radiation monitoring, warning sirens and communications) fail during the Hurricane? Have these systems been reestablished?

Hurricane Andrew hit south Florida with sustained surface winds of up to 145 miles per hour (mph) per the National Hurricane Center estimate. Several unofficial reports estimate stronger gusts. The eye of the storm passed over the site and caused significant onsite and offsite damage. However, the nuclear portion of both units, that is the portions that could pose a radiological hazard to the public if they failed, were not damaged. Prior to the advent of the storm, the licensee, in accordance with its emergency planning procedures, brought the Units to a hot shutdown (Mode 4) and the units remained in a stable condition. There was no release of radiation to the environment.

*there was some release*

*no release/unexpected release*

Following completion of the storm damage repairs to the Turkey Point Unit 4 and common systems, the licensee restarted Unit 4 on September 29, 1992. Storm damage repairs to the Turkey Point Unit 3 are being implemented during its ongoing Cycle 13 refueling outage. Unit 3 is expected to resume its power operation by November 25, 1992.

*No marks for CP problem*

The storm included damage to the fire protection, security / surveillance, radiation monitoring, warning sirens, and communications systems. The storm also caused loss offsite power. Following the storm, the licensee either restored the specific functions of these systems or implemented appropriate alternate means to meet their functions. Each of these systems is discussed below:

Fire Protection System

As a result of the hurricane winds the service water system high water storage tank collapsed and caused damage to the fire protection system. Within a few hours following the hurricane, the licensee established 30-minute roving fire watch patrols with the available personnel and by August 31, 1992, when qualified fire watch personnel became available, established Technical Specifications (TS)-required fire watches. By 5:20 p.m. on August 27, 1992, the licensee established a backup fire water capability which met the TS requirements. Prior to restart of Turkey Point Unit 4, the licensee implemented an interim fire protection configuration with backup water and backup pump capabilities. The licensee performed a safety evaluation of this interim configuration and satisfactorily demonstrated compliance with Appendix R to 10 CFR 50 and TS requirements. On October 5-9, 1992, the NRC staff inspected and verified the licensee's implementation of the plant's fire protection/prevention program including the interim fire protection system configuration. The licensee restored the fire protection system to its design basis configuration by November 15, 1992. To prevent any future damage of these types to the fire protection system, the licensee has eliminated the service water high water storage tank.



564

## Security/Surveillance

The storm caused damage to security buildings which were constructed to withstand 120 mph winds. The Intrusion Detection and Surveillance (IDS) System remained operational until the cameras or intrusion equipment also sustained damage due to the storm. At least nine protected area barriers were also damaged. Within a few hours after the storm, the licensee assessed the damage and deployed security personnel to secure the site and establish personnel and material access controls. Subsequently, the licensee re-established the Secondary Alarm Station (SAS) as its command and control facility. Armed security officers were positioned in the Auxiliary Building which would have been the most direct passage to containment. At the conclusion of the storm, security personnel were deployed in and around the protected and vital area. During subsequent searches of the protected and vital areas, there were no indications of site penetration during the storm.

The full regulatory acceptable security system was established by the licensee on September 22, 1992. Security measures were reviewed and found acceptable by the NRC Region II Safeguards Inspectors on September 23-25, 1992.

## Radiation Monitoring

RPG

No abnormal

Radiation monitoring is performed by 21 direct radiation monitors, specifically, thermoluminescent dosimeters (TLD) and 5 air samplers. The TLDs were secured to various appurtenances, such as trees and poles. Many of the trees were destroyed by the hurricane. Four air sampling stations and several TLDs surrounding the plant were destroyed during the storm. During and after the storm, direct radiation levels were monitored by 13 of the 21 environmental TLDs required by TS which were recovered. In addition, approximately 52 of 76 TLDs located within the licensee's radiologically controlled area (RCA) and protected area boundaries also remained functional to monitor any potential releases from the plant. Preliminary results of radiological environmental samples, e.g. broad leaf vegetation, water, soil and sediments, which were collected on September 9, 1992, indicated no abnormal readings.

All results were within bounds to TLD normal levels

The licensee contracted with the State of Florida to conduct the radiological environmental monitoring program. The State initiated sample recovery and damage estimates for the program on September 2, 1992. Restoration and replacement of equipment was initiated on September 9, 1992. All TLDs and air monitoring equipment were replaced and determined to be operable by September 14 and September 19, 1992, respectively.

To aid recovery in the event of a future hurricane, the licensee plans to attach the TLDs to the warning siren poles which may better withstand the hurricane forces.

Why say this?



## Warning Sirens

Many of the sirens, towers, and repeaters became inoperable during the hurricane. Although the exact time at which the licensee became aware of the degraded condition of the siren system is not known, the licensee assumed complete system disablement and initiated restoration activities as soon as access roads were cleared. Full siren system restoration and system testing was accomplished by September 21, 1992.

The State of Florida Radiological Emergency Plan for Nuclear Power Plants recognizes the possibility that the sirens may become inoperable. Because of this possibility, an alternate means of notification is preplanned in the State's Emergency Plan. This alternate means consists of "route alerting" the population within the area of interest. The route alerting is performed by backup police, fire rescue, and/or airplanes with loudspeakers, notifying the population to take the necessary actions.

## Communications

Sustained hurricane winds caused damage to transmission lines, antennas and transmitters. The communications systems that operated on the Southern Bell aerial copper wire along Palm Drive failed due to fallen trees and other foreign objects from high velocity winds. Following the storm, the licensee reestablished communications, on an intermittent basis, with portable transceivers and security station cellular telephones which were functional after the storm. Continuous communications were established by the afternoon of August 24, 1992.

Since the hurricane, the communications systems that relied on the Southern Bell aerial copper wire have been replaced by a buried fiber optic cable along Palm Drive. In addition, the licensee has installed two new high frequency radio systems to facilitate communications between the plant and offsite. These communications systems are designed with antennas to withstand winds in excess of 170 miles per hour. Spare antennas are also available onsite to ensure prompt replacement, if needed. *in 2nd? up 11?*

## Offsite Power

The storm caused damage to transmission lines and switchyard equipment which resulted in loss of offsite power. Offsite power was established to the fossil fuel-fired units startup transformers at 6:35 p.m. on August 29, 1992. However, power was not brought onto the nuclear side until the reliability of the offsite power sources was verified. One vital bus each for Unit 3 and Unit 4 was energized from offsite power on August 30. A second source of offsite power was available on September 2, 1992.

The Turkey Point plants are designed with four (two per unit) emergency diesel generators (EDGs) such that they receive an automatic start signal immediately on sensing a loss of load from the offsite power supply buses. Only one EDG

~~DRAFT - PREDECISIONAL~~

per unit is required to provide emergency power. In addition, the four EDGs can be cross-tied, if necessary, to provide emergency power to the other unit. Once the diesel motor and generator are running at the proper speed (rpm) the load sequencer automatically sequences the various safety-related loads to the generator. The EDGs and sequencers worked as designed. The licensee, in preparation for the storm, tested the EDGs and verified that all fuel tanks were full prior to the onset of the storm. The available fuel exceeded TS requirements. None of the safety-related EDGs suffered any damage from the storm since they are housed in seismic Category 1 designed steel reinforced concrete structures.

Is it credible to think that the Hurricane impacted population could have been evacuated during, or after, the storm if there was a nuclear accident at Turkey Point?

The potential for the situation at Turkey Point to deteriorate further in the aftermath of the damage done by Hurricane Andrew was minimal, although the potential hypothetically did exist. NRC officials, who were closely monitoring plant conditions on a 24-hour basis, believed there was no significant radiological risk to the public during or after the storm.

During the time of the hurricane and during the time period that the site was without offsite power, the plants were in Mode 4 ("Hot Shutdown") as required by emergency plan implementing procedures and, therefore, not operating. The plants were placed in "Cold Shutdown", or Mode 5, as follows:

at 5:05 p.m. on August 25, for Unit 3; and

at 10:15 a.m. on August 26, for Unit 4.

Emergency diesel generators provided power to the vital emergency equipment throughout the event, as designed, in a fully reliable manner. Offsite power was restored to the nuclear units on August 30, 1992.

The ten-mile emergency preparedness zone (EPZ) was largely evacuated during the first few days after Hurricane Andrew although some residents began to re-enter the zone during the period. The state and local counties would have been called upon to implement their in-place and previously exercised emergency plans if a radiological emergency had occurred in order to protect public health and safety. Where elements of offsite emergency preparedness had been compromised, the state and local counties may have required additional Federal and state assistance in order to assure that adequate compensatory measures could have been implemented for protection of public safety. Prior to the hurricane, an evacuation order covering over 99% of the population in the EPZ, was issued by Dade and Monroe Counties. As the main thoroughfares leading out of the EPZ remained passable following the hurricane, it is believed that the population, which did not evacuate, had the ability to do so if the need arose. We should note that Turkey Point had entered mode 4 (hot shutdown) prior to the arrival of the hurricane. A

DRAFT ~~PREDECISIONAL~~

radiological release, due to a nuclear accident from the plant with the plant in mode 4, is not considered likely.

If not, should we replace the power supplied by Turkey Point with alternative sources of energy?

A response to this question, prepared by Florida Power & Light, is attached.

Finally, who is investigating the environmental impact of the oil spill that occurred at Turkey Point during the Hurricane?

A response to this question, prepared by Florida Power & Light, is attached.

DRAFT - ~~PREDECISIONAL~~

Input to the Response to Sen. Graham

FIRE PROTECTION

The fire protection system at the Turkey Point nuclear plant is designed to meet the National Fire and the South Florida Building Code. The fire protection system is designed as a Class III system which requires this system to withstand winds of 120 mph. The NRC's fire protection guidance does not require the design of the fire protection system to remain fully functional under a severe natural phenomena occurrence such as the one experienced by the Turkey Point Facility during Hurricane Andrew.

The major failures of the fire protection system during Hurricane Andrew were attributed to the collapse of the service water system high water storage tank. During the hurricane, the tank collapsed onto a portion of the fire protection system. This caused damage to the raw water storage tank 1, the electric driven fire pump casing and the pump controller, jockey system pressure pumps, and piping. During Hurricane Andrew, the licensee reported the loss of the fire protection system to the NRC. It should be noted on August 24, 1992, at 0916 est, the licensee upgraded their emergency notification status from an unusual event to an alert as a result of the degradation to the fire protection system. On August 27, 1992, at 1800 est, the licensee had established an alternative fire water supply and pumping capabilities and on August 28, the diesel driven fire pump and its water supply had been re-established. On August 30, 1992, the licensee had completed the necessary repairs to declare the fire protection system functional.

The NRC is not requiring the fire protection system to be rebuilt to more stringent hurricane specifications. The licensee, in their efforts to assure that future hurricane damage to the fire protection system is minimized, is evaluating the site for objects which could impact the fire protection system if they were to collapse. In order to restart the Turkey Point facility, the licensee had to satisfy the operating conditions of the plant's Technical Specifications. This included assuring the functionality of the fire protection system.

N/12

To: Kerry D. Landis, KII  
From: F. Rinaldi, PD22

(404) 331 5509  
(301) 504 14 44

Input to the Response to Sen. Graham

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