



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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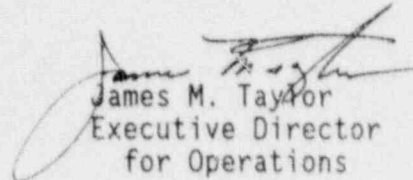
The Honorable Bob Graham
United States Senator
P.O. Box 3050
Tallahassee, FL 32315

Dear Senator Graham:

Our response to your constituents' questions with regard to Hurricane Andrew's impact at Turkey Point (letter to your office dated September 12, 1992) is enclosed. Previously, we briefed your staff and subsequently provided additional information and inspection reports concerning Hurricane-Andrew related matters.

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

Sincerely,


James M. Taylor
Executive Director
for Operations

Enclosure:
As stated

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QUESTION

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?

RESPONSE

On August 24, 1992, Hurricane Andrew hit south Florida with sustained surface winds of up to 145 miles per hour (mph) according to 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 to some equipment that were not designed to withstand hurricane force winds of the magnitude associated with Hurricane Andrew. However, the nuclear portion of both units, that is the portions that could pose a radiological hazard to the public if they failed, were designed to withstand hurricane force winds and were not damaged. Before 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 were no abnormal or unexpected releases of radiation to the environment.

The storm damaged the fire protection, security and surveillance, radiation monitoring, warning sirens, and communications systems and also caused loss of offsite power. Following the storm, the licensee either restored the specific functions of these systems or implemented appropriate alternate means to meet these functions. The licensee restarted Unit 4 on September 29, 1992. On October 1, 1992, following discussions between the licensee, the Federal Emergency Management Agency (FEMA) and the NRC, the licensee brought Unit 4 to cold shutdown pending further consideration by FEMA and the NRC of the status of emergency preparedness in the area around the Turkey Point site. By letter dated October 23, 1992 to the NRC, FEMA reaffirmed its finding of reasonable assurance of protection to the public health and safety in the event of a radiological emergency. By letter dated October 23, 1992, the NRC informed the licensee of FEMA's reaffirmation and indicated that the conditions which led to the cold shutdown of Unit 4 have been satisfied. On October 24, 1992, Unit 4 resumed its power operation. Storm damage repairs to 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.

Damage to each of the 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 available personnel. By 5:20 p.m. on August 27, 1992, the licensee established a backup fire water capability to meet the plant technical specifications (TS) requirements. By August 31, 1992, when qualified fire watch personnel became available, the licensee established required fire watches in accordance with the TS. Before 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 Title 10 of the Code of Federal Regulations, Part 50 (10 CFR Part 50) and TS requirements. During October 5 through 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.

Security/Surveillance

The licensee's security systems consist of an initial protected area barrier with associated intrusion detection and assessment equipment. Additional barriers and associated alarms protect the vital equipment. Assessment and response are provided by security officers. This equipment is not required to withstand hurricane force winds since the licensee has in place provisions for compensatory measures in the event of equipment failure. There was equipment failure at the perimeter consisting of damage to several barriers, microwaves, cameras, and the site access building. Additionally, some short term vital area alarm failure occurred, but the vital area barriers remained intact.

On August 24, 1992, before the advent of the storm, licensee management suspended security safeguards in accordance with its Physical Security Plan in anticipation of severe weather conditions. The systems were not de-activated. After lockdown and securing all access control points, the licensee evacuated all security personnel to shelters in Class I buildings which are constructed to withstand 145 mph winds. Following the licensee's initial damage and safety evaluation and determination that other personnel could depart shelters, security officers were deployed to assess damage and to secure the site. During subsequent searches of the protected and vital areas, there were no indications that the site had been penetrated by an outsider during the storm.

On August 24, 1992, security re-established personnel and material access controls along with alarm response. Compensatory measures were implemented for the failed protected area equipment.

The regular security program was re-established by the licensee on September 22, 1992, with some compensatory measures still in place. Security measures were reviewed and found acceptable by Region II Safeguards Inspectors on September 23-25, 1992.

Radiation Monitoring

The licensee maintains a program to monitor radiation both onsite and in the environs. Unless the monitoring instruments are protected by plant structures which will protect against hurricane force winds, they are vulnerable to damage or loss. In accordance with the TS, offsite radiation monitoring is performed by direct radiation monitors, specifically, thermoluminescent dosimeters (TLDs), and air samplers. The TLDs were secured to various appurtenances, including trees and poles that were destroyed by the hurricane. Four air sampling stations and several TLDs surrounding the plant were destroyed during the storm. During and immediately after the storm,

13 of the 21 environmental TLDs remained available to monitor direct radiation levels and no abnormal radiation levels were noted. 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. All results were within normal levels for TLDs. Results of radiological environmental samples (e.g. broad leaf vegetation and water), which were collected on September 9, 1992, indicated no abnormal readings.

The licensee has contracts 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.

Warning Sirens

The warning sirens are not required to withstand hurricane force winds of the magnitude experienced during Hurricane Andrew. 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 compensatory measures and restoration activities as soon as access roads were cleared. Full siren system restoration and system testing were accomplished by September 21, 1992.

Communications

Sustained hurricane winds caused damage to transmission lines, antennas, and transmitters. These offsite communication systems were not designed to withstand the event that occurred. The communications systems that operated on the Southern Bell aerial copper wire along Palm Drive failed as a result of 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 that were functional after the storm. Continuous communications were reestablished by the afternoon of August 24, 1992, several hours after the hurricane.

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. New antennas, designed to withstand winds in excess of 200 mph, are being procured to improve system reliability. Spare portable antennas also are available onsite to ensure prompt replacement, if needed.

Offsite Power

The storm caused damage to transmission lines and switchyard equipment, which resulted in the loss of offsite power. Plant nuclear safety systems were designed to operate without offsite power. Offsite power was re-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 site 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, 1992. 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 and 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 (revolutions per minute), 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. The available fuel exceeded TS requirements. None of the safety-related EDGs suffered any damage from the storm because they are housed in seismic Category 1 steel reinforced concrete structures.

QUESTION

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

RESPONSE

In ordering protective actions for the public in the event of a radiological emergency, state and local officials must take due account of severe weather and circumstances affecting public health and safety. Given advance warning of a hurricane, authorities normally take actions to prevent or reduce danger to the public. Consequently, before the hurricane, Dade and Monroe Counties issued an evacuation order to the population in the area including the ten-mile emergency preparedness zone. Approximately two hours before the arrival of the hurricane, the licensee, in accordance with its emergency plan implementing procedures, brought the nuclear plants to Mode 4 (hot shutdown) and, therefore, the nuclear units were not operating. Units 3 and 4 were placed in Mode 5 (cold shutdown) at 5:05 p.m. on August 25, and at 10:15 a.m. on August 26, 1992 respectively. The nuclear portions of both units were not damaged. During the time the site was without offsite power, EDGs provided power to the vital emergency equipment throughout the event, as designed, in a reliable manner and the plants remained in a stable condition. Offsite power was restored to the nuclear units on August 30, 1992.

QUESTION

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

RESPONSE

The following is a summary of response from the licensee regarding environmental impact due to the oil spill.

As a result of the storm on August 24, 1992, the fossil-fuel fired unit 1 metering tank sustained missile damage causing the tank to leak. As the oil level in the tank dropped the fuel oil transfer pumps automatically started pumping oil into the damaged metering tank. At 5:45 a.m. on August 24, 1992, during the passage of the eye of the storm, FPL personnel terminated the discharge of the oil by shutting off the power to the transfer pumps. An estimated 115,000 gallons of grade 6 fuel oil was discharged. Though much of the oil entered the concrete containment surrounding the tank, the high winds associated with the hurricane caused some of the oil to be blown throughout the plant area. Six inches of oil was found in the units 1 and 2 intake, with a sheen to 0.25" of oil in the units 3 and 4 intake. Immediately following the storm, FPL deployed oil containment booms to contain the oil discharge and initiated the cleanup process. Approximately 70,000 gallons of oil was recovered and burned as fuel in the unit 2 boiler. By September 19, 1992, FPL completed the cleanup of all surface waters. Cleanup of soil is approximately 97% complete.

On August 24, 1992, FPL notified the Nuclear Regulatory Commission, the National Response Center, the Florida Emergency Response Commission, and the Florida Department of Environmental Regulation. Additionally, on August 25, 1992, the Florida Department of Natural Resources and the Coast Guard Marine Safety Officer were also notified. On August 26, 1992 the Florida Department of Natural Resources inspected the site. On August 27, 1992, the Environmental Protection Agency's Region IV Federal On-Scene Coordinator out of the Waste Management Division performed a hazardous material condition assessment, and on August 28, 1992, the Florida Game Commission officers toured the area. As of November 19, 1992, FPL has not been advised of conclusions of the above agencies inspections.