



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20548

October 15, 1992

MEMORANDUM FOR: James M. Taylor  
Executive Director for Operations

FROM: Thomas E. Murley, Director  
Office of Nuclear Reactor Regulation

SUBJECT: EVALUATION OF STAFF PARTICIPATION IN TURKEY POINT  
RECOVERY AND RESTART FOLLOWING HURRICANE ANDREW

At your request, we have done a brief critical review of our activities related to the Turkey Point recovery and restart decision, especially as they pertain to offsite emergency preparedness. The enclosed report discusses the root causes of the premature restart concurrence, the major contributing factors, and the lessons learned to preclude similar problems in the future. A chronology of NRR activities and actions is provided as an attachment to the report.

Action items, consistent with implementing the lessons learned, will be developed.

A handwritten signature in cursive script, reading "T. Murley".

Thomas E. Murley, Director  
Office of Nuclear Reactor Regulation

Enclosure: As stated

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EVALUATION OF STAFF PARTICIPATION IN TURKEY POINT  
RECOVERY AND RESTART FOLLOWING HURRICANE ANDREW

Introduction

The purpose of this report is to document and evaluate NRR's actions related to the Turkey Point recovery and restart decision, as they pertain to offsite emergency preparedness, to identify the root causes of NRR's premature restart concurrence and the contributing factors, and the lessons learned from the experience.

On August 24, 1992, Turkey Point Units 3 and 4 sustained extensive site damage as a result of Hurricane Andrew. South Florida was declared a disaster area by the President and a Federal Response Plan seeking assistance from various federal agencies, including FEMA and NRC, was implemented.

As a result of the hurricane, there was a complete loss of offsite power, communications and access by road, and damage to the fire protection and security systems. In addition, the offsite alert notification system was lost. Immediately after the hurricane, the licensee began its damage assessment and recovery operations with the objective of restoring Unit 4 to operable status as quickly as possible and then initiating the previously scheduled Unit 3 refueling outage activities. The licensee's immediate damage assessment indicated that restoration of Unit 4 could take several months.

During the recovery period the NRC staff, both Region II and NRR, maintained an extensive and active interface with the licensee. In addition to a Regional presence at the site, there were several meetings at the site, and staff reviews of licensee actions and supporting documentation. Notwithstanding the licensee's immediate estimate, by early September the licensee announced plans to restart Unit 4 by the end of September. On September 28, 1992, the NRC staff reviewed and concurred in the licensee's readiness for restart. The licensee restarted the unit on that date. During power ascension on October 2, 1992, at the NRC's request, the licensee brought Unit 4 to cold shutdown because it became evident that FEMA had not completed its assessment and confirmation of the current adequacy of offsite emergency preparedness capabilities.

### **Problem**

The problem was that a FEMA "reappraisal" or "recertification" was not conducted in a timely manner due to inadequate coordination between Projects and DREP (now DRSS) to consult with FEMA in a timely manner to support the restart. There was a lack of sensitivity within NRR to the need for FEMA input on a restart decision involving offsite matters.

### **Contributing Factors**

Region II formed a task force to monitor all the licensee's recovery operations and activities. A Technical Interface Agreement (TIA) was prepared coordinating Region II and NRR activity. NRR reviewed the acceptability of the interim fire protection configuration, Unit 1 stack demolition and Unit 2's stack damage condition for restart. While there was active coordination between Projects and the NRR divisions involved in the TIA, there was insufficient coordination between Projects and DRSS, with respect to the responsibility for the FEMA interface. The root cause of this problem is that there were no coherent restart criteria with respect to the emergency preparedness which would have identified all the necessary elements and activities for restart, including assigned responsibilities.

### **Lessons Learned**

#### **1. Develop Restart Criteria**

Any restart plan following a shutdown due to a significant event should begin with a detailed checklist of required licensee and staff actions as well as actions by other entities. The checklist should specifically include consideration of offsite emergency preparedness issues. The restart plan with its checklist should be reviewed and concurred in by all cognizant organizational elements. The use of confirmatory action letters (CAL) and TIAs which identify required licensee and staff actions should be required. This should ensure that all necessary aspects of restart receive adequate consideration.

#### **2. Strengthen Interface Between Region and NRR, and Within the NRR Organizations**

Staff understanding of the interfaces and scope of responsibilities of the Regions and the Headquarters organizations should be strengthened, particularly during situations involving a plant restart following a shutdown due to a significant event. The Projects organization should coordinate

with every technical division director to assure appropriate involvement of that division. This would ensure that each organization is adequately represented in making the restart decision.

As evidenced by the chronology of events, documentation existed which identified the restart activities in progress, including the restart schedule. However, there should be sufficient proactive coordination to assure that such documentation receives adequate consideration.

**TURKEY POINT UNIT 3/4  
CHRONOLOGY OF NRR INTERACTIONS**

<u>DATE</u>	<u>ITEM</u>
1. 8/26/92	Events Assessment Branch presentation. Sequence of events following Hurricane Andrew and its impact on Turkey Point Units 3/4.
2. 8/26/92	Director's Highlight. Licensee's damage assessment in progress. Licensee believes that it could take several months to recover.
3. 3/27/92	Region II issues PNO-II-92-055A. South Florida declared a disaster area. Federal Response Plan calls for assistance from various agencies, including FEMA, DOE, EPA, NRC, etc.
4. 8/31/92	Memorandum from E. Jordan (AEOD) to T. Murley, "Commission Notification and Charter for the Review of Hurricane Andrew's Impact on Turkey Point." Goal is to describe damage and compile experience gained from the hurricane impact through a joint NRC/Industry team.
5. 8/31/92	L. Raghavan (PM) returns a call from Ms. Elaine Chan of FEMA Headquarters. Provided general detail of storm damage to plant.
6. 8/31/92	Region II forwards to NRR "Turkey Point Recovery Organizational Charter (Draft)." Project Director of PDII-2 is proposed to be the NRR liaison to the Task Force.
7. 8/31/92	Region II forwards to NRR licensee's proposed interim fire protection configuration.
8. 9/1/92	C. Wingo (FEMA) asked R. Erickson (PEPB) to send copies of NRC's daily event summary reports on Turkey Point issued by the Operations Center. The first one sent was dated 8/31/92. The last one was dated 9/22/92.
9. 9/1/92	Region II forwards to NRR licensee's schedule for restart of Unit 4. Unit 4 to return to service on September 30, 1992.
10. 9/2/92	Licensee forwards a copy of 10 CFR 50.59 evaluation for demolition of Unit 1 stack using controlled explosives.

11. 9/2/92 Telephone conversation between NRR, Region II and the licensee. Discussed plant status, Interim fire protection configuration and licensee's proposal to demolish Unit 1 Stack by controlled explosive charge. NRC discusses need for seismic instrument recorders, ground impact on fall of the stack, stack collapse direction, safety precautions. NRR reviews the 50.59 evaluation and finds it acceptable.
12. 9/4/92 Region II, with NRR concurrence, verbally approves suspension of continuous fire watch for a few hours during the demolition of Unit 1 stack.
13. 9/4/92 Unit 1 stack demolished by controlled explosives.
14. 9/4/92 The licensee requests a "Temporary Waiver of Compliance" to suspend continuous fire watch for a few hours during demolition of Unit 1 stack.
15. 9/7/92 Licensee's special report. High range noble gas monitor has not been returned to service within 7 days as required. Alternate method for monitoring consistent with TS implemented.
16. 9/8/92 Memorandum from A. Chaffee, Chief, Events Assessment Branch, to C. E. Rossi, Director, Division of Operational Events Assessment, with copies to senior NRC management. Notes of 8/26 presentation (Item 1 above), summary of sequence of events following Hurricane Andrew.
17. 9/8/92 Region II, with NRR concurrence, documents the Temporary Waiver to suspend fire watch during demolition of Unit 1 stack.
18. 9/8/92 Daily Highlight. "Turkey Point Hurricane Damage". Informs that Unit 1 stack has been demolished by controlled explosive charges (see item 13).
19. 9/9/92 FPL letter to NRC details Turkey Point actions concerning plant security during and after the storm.
20. 9/9/92 FPL letter to NRC provides Turkey Point Units 3/4 Emergency Plan Assessment Report as of September 7, 1992. Discusses status of EP elements.
21. 9/9/92 Director's Highlight on general status of plant.

22. 9/10/92 NRR and Region II meeting with the licensee at site. Discussed licensee's damage assessment of Hurricane Andrew and recovery plans, schedule and status including emergency preparedness. Unit 4 restart scheduled for 9/30/92.
23. 9/11/92 Internal Memorandum from L. Shao (RES) to E. S. Beckjord, Director, Office of Nuclear Regulatory Research, with copies to T. Murley, W. Russell, et. al. General discussion of impact of hurricane on Turkey Point. Review damage to plant, background information relating to IPEEE and PRA for Turkey Point. Included a list of vulnerable structures and possible questions on wind damage to plant. Describes possible future actions, i.e., review hazard curves used in the PRA and IPEEE reviews.
24. 9/14/92 E-Mail from L. Bagchi, Structural and Geoscience Branch, to M. Sinkule (Region II). Indicates need to assess damage to fossil unit stacks.
25. 9/16/92 Director's Highlight identifies 9/30/92 date for Unit 4 restart.
26. 9/16/92 Telephone conference between S. Varga, G. Laines, L. Raghavan, and F. Congel relating to Risk Application Branch review of Turkey Point IPE following the hurricane.
27. 9/17/92 Meeting Summary issued by Region II for September 10, 1992 meeting (see item 22). Provides detailed damage assessment, recovery status and schedule.
28. 9/17/92 Memorandum from L. Raghavan, thru S. Varga, to T. Murley, F. Miraglia, J. Partlow and W. Russell, with copies to Region II. Discusses current status, recovery and restart plan, other activities, observations and identifies action items. Included as enclosures licensee's damage assessment results, overview of U-3/4 recovery plan, and excerpts from the licensee's IPE submittal.
29. 9/21/92 H. Berkow and L. Raghavan met with W. Beckner (Risk Applications Branch) relating to Turkey Point IPE following the hurricane.

30. 9/22/92 NRR meeting with the licensee at site. Discussion on Interim fire protection, Unit 2 stack structural evaluation and restart plan. NRR found the interim fire protection configuration and Unit 2 stack in the present condition acceptable for restart. Indicated the need for licensee's reevaluation of its IPE following the hurricane. The licensee confirmed its plan to revisit its IPE analysis. The licensee would provide schedule for this effort.
31. 9/23/92 Director's highlight reconfirms 9/30/92 as the plant restart date. Indicates that Region II will issue a TIA.
32. 9/24/92 L. Raghavan (PM) and S. Long (Risk Applications Branch) discuss with E. Weinkam, Licensing Manager, FPL plant data relevant to IPE.
33. 9/24/92 Memorandum from G. Bagchi, Chief, Structural and Geoscience Branch, to J. Richardson, Director, Division of Engineering Technology, with copies to W. Russell, Region II, et. al. Summary of 9/22/92 meeting (see item 30) relating to assessment of structural integrity of Unit 2 stack in the existing condition. Concludes that the Unit 2 stack in the existing condition is acceptable for restart and provides recommendation for long term.
34. 9/24/92 L. Raghavan returns a call from Ms. Lorion (Floridian for Safe Energy). Provides details of interim fire protection configuration.
35. 9/25/92 NRC Letter from L. Raghavan to Ms. Lorion. Forwards a copy of TS relating to fire protection and a copy of 10 CFR 50.59.
36. 9/28/92 Telephone conference between NRR, Region II and the licensee to discuss readiness for restart. Discussed completion of various restart action items including the interim fire protection configuration, licensee's management oversight on site, EP routes and offsite EP facilities. Licensee's Corporate Nuclear Review Board has reviewed the restart operations.
37. 9/28/92 Region II issues TIA. Identifies nine significant NRC actions required for restart.

38. 9/29/92 H. Berkow announced Turkey Point Unit 4 restart in the weekly DRP/DST Branch Chief's meeting. R. Erickson (PEPE) asked about Offsite EP readiness. Berkow stated RII had addressed EP issues.
39. 9/29/92 D. Barss (PLB) phoned W. Rankin, RII EP Section Chief, about offsite EP readiness for Turkey Point restart. He received positive report on sirens, communications, met tower, and evacuation routes, and was told FEMA Region IV expressed no concerns. He also mentioned that RII staff was to discuss restart with Senator Graham's staff this day.
40. 9/29/92 R. Erickson phoned C. Wingo (FEMA Headquarters) about the restart and faxed him the latest PN (PNO-II-92-063). Wingo was to contact his staff person, D. Kohl, in the Miami Disaster Field Office, and have him check with State and local authorities on offsite EP readiness. Wingo asked for names of contact persons in FP&L and NRC.
41. 9/30/92 R. Trojanowski, RII State Liaison Officer, phoned R. Erickson and reported on his 9/29 contact with J. Heard of FEMA Region IV about offsite EP for Turkey Point. Erickson shared notes of this call by E-Mail with interested HQ staff.
42. 9/30/92 R. Erickson express-mailed to Craig Wingo (FEMA) all the documents we could find dealing with the restart, including PNs and the Region's letter summarizing its restart meeting with FP&L.
43. 10/1/92 Daily Highlight, "Turkey Point, Units 3/4." Provides general plant status.
44. 10/6/92 Draft memorandum from S. Long to W. Beckner, "Estimate of Conditional Core Damage Probability for the Impact of Hurricane Andrew on Turkey Point."
45. 10/13/92 Meeting summary for 9/22/92 meeting issued (see item 30). NRR documents its evaluation and acceptability for restart the licensee's Interim fire protection configuration and Unit 2 stack damage condition. Also includes recommendation for inservice surveillances of the Unit 2 stack pending its modification.