



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION II  
 101 MARIETTA STREET, N.W.  
 ATLANTA, GEORGIA 30323

Report Nos.: 50-250/86-04 and 50-251/86-04

Licensee: Florida Power and Light Company  
 9250 West Flagler Street  
 Miami, FL 33101

Docket Nos.: 50-250 and 50-251

License Nos.: DPR-31 and DPR-41

Facility Name: Turkey Point 3 and 4

Inspection Conducted: January 15-16, 1986, Enforcement Conference held  
 January 31, 1986

Inspector:

*W. T. Cooper*  
 W. T. Cooper

2-19-86  
 Date Signed

Approved by:

*C. M. Hosey*  
 C. M. Hosey, Section Chief  
 Division of Radiation Safety and Safeguards

2/19/86  
 Date Signed

SUMMARY

Scope: This special, unannounced inspection entailed 23 inspector-hours at the site in the area of external exposure and management controls during work performed on the Unit 3 flux mapping system.

Results: Two violations were identified - failure to conduct operations in accordance with either approved or adequate procedures, and failure to adequately train an individual in the use of a radiation detection instrument.

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## REPORT DETAILS

## 1. Persons Contacted

## Licensee Employees

- \*C. J. Baker, Plant Manager
- \*D. D. Grandage, Operations Superintendent
- \*K. L. Jones, Technical Department Supervisor
- \*J. L. Danek, Corporate Health Physics
- \*R. J. Acosta, QA Superintendent
- \*M. A. Ammerman, Training Supervisor
- \*J. W. Kappes, Maintenance Superintendent
- \*R. D. Hart, Regulation and Compliance
- \*P. W. Hughes, Health Physics Supervisor
- \*H. E. Yeager, Manager, Nuclear Maintenance
- M. A. Jimenez, Health Physics Engineer
- T. A. Coleman, Health Physics Admin. Supervisor
- R. M. Givens, Health Physics ALARA Engineer
- F. Marder, Health Physics, Operations
- E. Hayes, I&C Department Supervisor

Other licensee employees contacted included five technicians, two security force members, and three office personnel.

## NRC Resident Inspectors

- T. A. Peebles
- \*D. R. Brewer

\*Attended exit interview

## 2. Exit Interview

The inspection scope and findings were summarized on January 16, 1986, with those persons indicated in paragraph 1 above. The inspector informed licensee management of two apparent violations resulting from the work conducted on the Unit 3 "A" flux mapping system on January 8, 1986. Licensee management acknowledged the apparent violations. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

## 3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.



#### 4. Unauthorized Entry Into Traverse Incore Probe (TIP) Drive Area

On January 10, 1986, the licensee notified the Region II staff of an unauthorized entry by an Instrument and Control (I&C) technician into the Unit 3 TIP drive area to perform maintenance on the system. The inspector discussed the entry with licensee representatives, reviewed records associated with this entry and interviewed the I&C technician, health physics technicians and the health physics shift supervisor on duty when the entry occurred and other licensee management personnel. Based on the review of records and interviews, the inspector determined the following sequence of events:

On December 28, 1985, the licensee determined that one of the Unit 3 flux mapping detectors was apparently stuck in the core of the unit. Plant Work Order (PWO) number 8404 was initiated to return the detector to normal operation or to withdraw the detector so that the 10 path could be used. On January 8, 1986, Unit 3 was shut down for a two week outage. Plant management gave permission for this work to be completed, and the PWO was signed at 5:30 p.m. on January 8, 1986. At this time work was coordinated with the Health Physics (HP) group and Radiation Work Permit (RWP) number 86-304 was issued to repair the flux mapper system.

On January 8, 1986, at 6:20 p.m., an I&C technician accompanied by a HP technician entered the Unit 3 containment to perform maintenance on the "A" TIP drive unit. A radiation survey performed by the HP technician in the area of the drive unit at 6:30 p.m. indicated general area radiation levels of five to twenty milliRoentgen per hour (mR/hr). Work during this initial entry included manual manipulation of the drive unit and tightening of bolts securing the clutch block. Both personnel exited the containment at 7:00 p.m. and proceeded to the HP office area. In a conversation with the Health Physics Shift Supervisor (HPSS) on duty, the I&C technician stated that later in the shift he would be proceeding to the Unit 3 Control Room to perform TIP manipulations to determine if the maintenance had been successful. The HPSS stated that he told the I&C technician that if additional work on the TIP drive was necessary, a HP technician had been assigned to provide job coverage and to contact that HP technician prior to work. Later in the evening, the I&C technician along with another I&C technician proceeded to the Unit 3 Control Room where the technicians discussed the operation of the TIP drive system, and withdrew the "A" detector from the core. The detector position indicator failed to indicate zero as was expected. At 9:30 p.m. hours on January 8, 1986, the I&C technician made a second containment entry for the purpose of re-zeroing the TIP drive. The HP technician stationed at the Unit 3 personnel access hatch control point instructed the I&C technician to contact the roving HP technician in the containment. Statements made by the I&C technician indicated that he attempted to contact the HP group for approximately ten minutes after entering the containment. When attempts to contact HP failed, the I&C technician stated that he proceeded to the TIP drive area to continue maintenance on the "A" Unit. During this containment entry, the I&C technician carried a portable survey meter capable of measuring up to one Roentgen per hour (R/hr). The technician entered the TIP drive area



unescorted and established telephone contact with the second I&C technician in the control room. The area had been posted previously by health physics personnel as High Radiation Area - Keep Out. The I&C technician approached the "A" flux mapper and noted increased radiation levels on his survey meter. He placed his meter near the detector safety limit switch and noted the instrument meter reading was 800 mR/hr. The technician stated that he then placed the instrument on top of the flux mapper drive unit and the meter reading decreased to zero. He then zeroed the TIP drive, taking approximately four minutes to complete the job.

Upon exiting the Unit 3 containment, the I&C technician's self-reading pocket dosimeter (SRPD) was read by the HP technician at the Unit 3 personnel access hatch control point. The control point technician found that the SRPD indicated a whole body exposure of 450 millirem. The control point HP tech contacted the HP office and was told to escort the I&C technician to the HP office. The I&C technician's TLD indicated a whole body exposure of 511 millirem, which was above the technician's administrative limit of 300 millirem. Licensee calculations indicated that the general area radiation levels during the I&C technician's work on the flux mapper were approximately six R/hr at the technicians work location and 65 to 70 R/hr on contact with the tubing containing the TIP. Actual measurements of the radiation field were not possible due to reinsertion of the detector into the core after maintenance was completed. Surveys performed after the event indicated that the general area dose rates were 5 to 25 mR/hr.

Licensee personnel stated that the Geiger-Muller instrument in use by the I&C technician exhibited characteristics of continuous discharge when placed in a radiation field greater than its upper limit. When the I&C technician made the survey upon entering the TIP area, the instrument indicated 800 mR/hr which was near the upper limit of the instrument. Movement of the instrument into a higher radiation field caused the instrument to fail low. The I&C technician stated that the training he had received in the instrument use did not address this subject.

10 CFR 19.12 required that all individuals working in or frequenting any portion of a restricted area shall be instructed in precautions or procedures to minimize their exposure and in the purposes and functions of the protective devices employed. In the General Employee Training (GET) program, licensee personnel attending Level III training were instructed in the basics of radiation detection instrument usage. The training consisted of calibration sticker checks, an explanation of the instrument scales, how to read each instrument scale and how to perform a survey. A licensee representative stated that the instruments were issued to personnel so that the personnel could roughly calculate their stay time in an area, control their radiation exposure and assess any changes in the radiation field initially identified by a HP survey. The inspector stated that the training was not adequate to allow personnel to assess the radiation hazards that may be present in that instructions given to the I&C technician who entered the Unit 3 containment on January 8, 1986, did not include methods to detect failure of the radiation survey instrument in use at the time of the entry

and actions to be taken if the instrument was suspected of failure. Consequently, the technician remained in the high radiation area unaware that the survey instrument was not responding properly due to the high radiation levels in the work area. The failure to properly instruct personnel in the purposes and functions of protective devices was identified as an apparent violation of 10 CFR 19.12 (50-250, 251/86-04-01).

Technical Specification (TS) 6.8.1 required that procedures be established, implemented and maintained consistent with Appendix A of Regulatory Guide 1.33. Regulatory Guide 1.33 required procedures for radiation protection, maintenance and nuclear instrument systems. Plant procedure 0190.19, Control of Maintenance on Nuclear Safety Related and Fire Protection Systems provided guidelines for maintenance of nuclear safety related and fire protection systems, components and equipment. Section 8.3.3 of Procedure 0190.10 required thorough documentation of disassembly/troubleshooting on Plant Work Orders (PWO), Section 8.3.4 required work to stop when all discrepancies and problems had been identified and Section 8.3.5 required the foreman/supervisor to clearly define the problem and corrective action in a step by step format. The inspector reviewed completed PWO number 8404. The inspector noted that the I&C technician involved in the work described on the PWO failed to thoroughly document the work he performed. Failure of the I&C Technician to document the work he performed under the PWO as required by plant Procedure 0190.19 was identified as an apparent violation of TS 6.8.1 (50-250, 251/86-04-02). The PWO instructed the I&C technician to return the flux mapper to normal operation or to withdraw the detector so the 10 path could be used. The technician performed work which was outside the scope of the instructions on the PWO when he performed work to re-zero the detector. The performance of work by the I&C Technician which was outside the scope of the PWO was identified as another example of an apparent violation of TS 6.8.1 (50-250, 251/86-04-02). Due to the experience level of the I&C technicians, the licensee requires the I&C Field Supervisors to clearly define the problem to be corrected and the action to be performed by the I&C technician in a step by step format. During the review of PWO 8404, the inspector found that the foreman/supervisor failed to provide instructions to the technician in a step by step format as was required by the procedure. The failure of the I&C Field Supervisor to provide instructions to the I&C Technician in a step by step format was identified as another example of an apparent violation of TS 6.8.1 (50-250, 251/86-04-02). Plant procedure 12407.2, Incore Flux Detector Drive Mechanism Repair and Detector Replacement, Section 4.2 required HP to perform a thorough survey after the detector had been fully withdrawn. Section 4.3 of Procedure 12407.2 required two persons to be present at all times while performing maintenance inside containment. Section 4.4 of Procedure 12407.2 required that workers not exceed the exposure limits established by HP on the RWP. Upon containment entry by the I&C technician on January 8, 1986, and after unsuccessful attempts by the technician to contact HP, the Technician performed maintenance on the drive units without first obtaining a detailed survey by HP personnel. Failure to obtain the required survey was identified as another example of an apparent violation of TS 6.8.1 (50-250, 251/86-04-02). Entry of the I&C Technician into the TIP drive area alone was identified as another example of a violation of



TS 6.8.1 (50-250, 251/86-04-02). Due to the high general area radiation levels in the vicinity of the flux mapper and the failure to have a thorough survey performed, the I&C technician exceeded his administrative exposure limit of 300 millirem. Exceeding the administrative limit established by the RWP was identified as another example of an apparent violation of TS 6.8.1 (50-250, 251/86-04-02).

Plant procedure 12404.1, Normal Operation of Incore Moveable Detector System and Power Distribution Surveillance, Section 8.11 required notification of the Nuclear Plant Supervisor and the HP Operations group before operating the incore detectors. The I&C technician stated that he attempted to page HP for approximately ten minutes prior to continuing his repairs on the detector. He made no additional attempts to make contact with HP. The failure to notify HP prior to moving the incore detectors was identified as another example of an apparent violation of TS 6.8.1 (50-250, 251/86-04-02).

During the review of Procedure 12407.2 the inspector noted that the procedure did not require that the other operable flux mapping drive units be tagged as out of service to prevent movement of those detectors while work was being performed on another unit. The Health Physics Supervisor stated that during future work, the flux mappers would be tagged out to him, and that he would control the movement of the detectors by the control of the tag-outs. The failure of procedure 12407.2 to address movement of the incore detectors not involved in the maintenance activity was identified as another example of an apparent violation of TS 6.8.1 (50-250, 251/86-04-02).

During review of this incident, the inspector noted that the RWP issued for this work was broad scope. Permissible activities ranged from allowing freeing of the detector from a stuck position to cutting the detector off the drive cable and placing it in a shielded cask. The use of such broad scope RWPs to control work in the Radiation Control Area will be reviewed during a future inspection (50-250, 251/86-04-03).

## 5. Enforcement Conference

An Enforcement Conference was held at NRC Region II on January 31, 1986, to discuss the unauthorized entry into the TIP Drive area by a licensee employee. The following persons were in attendance:

### a. Florida Power and Light

- C. O. Woody, Group Vice President - Nuclear
- J. W. Dickey, Vice President, Nuclear Operations
- C. J. Baker, Plant Manager, Turkey Point
- D. A. Chaney, Supervisor, Licensing Operations
- J. M. Donis, Site Engineering Supervisor
- F. H. Southworth, Technical Advisor
- J. Arias, Jr., Regulation and Compliance Supervisor, Turkey Point
- J. M. Mowbray, Senior Engineer
- P. W. Hughes, Health Physics Supervisor, Turkey Point
- J. L. Danek, Corporate Health Physicist



b. Nuclear Regulatory Commission

J. N. Grace, Regional Administrator  
R. D. Walker, Director, Division of Reactor Projects  
J. P. Stohr, Director, Division of Radiation Safety and Safeguards  
G. R. Jenkins, Director, Enforcement/Investigations Staff  
D. M. Collins, Chief, Emergency Preparedness and Radiological  
Protection Branch  
V. W. Panciera, Chief, Projects Branch 2  
C. M. Hosey, Chief, Facilities Radiation Protection Section  
S. A. Elrod, Chief, Project Section 2C  
T. A. Peebles, Senior Resident Inspector  
D. R. Brewer, Resident Inspector  
S. Guenther, Project Inspector  
G. A. Schnebli, Reactor Inspector  
W. T. Cooper, Radiation Specialist  
L. Trocine, Enforcement Specialist  
W. Beach, NRC Headquarters

The discussion included a summary of the event, apparent causes, corrective actions and actions to prevent recurrence. The licensee voiced the opinion that the event was caused by the actions of a single individual and should be viewed as an isolated case of an individual deliberately violating procedures.

These corrective actions included:

- Reinstruction of the entire plant staff by the Plant Manager in the need to follow radiation control procedures;
- The demotion of the I&C Technician who made the entry and reassignment to non-nuclear activities. He eventually quit FP&L employment;
- The reprimand of the I&C Supervisor involved; and
- The tagging out of the TIP controls to the HP Supervisor during outages.

The licensee's corrective action appeared to be timely, thorough and exhibited a positive management commitment toward preventing a recurrence.

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