



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

February 28, 2012

Mr. Mano Nazar  
Executive Vice President and  
Chief Nuclear Officer  
Florida Power and Light Company  
P.O. Box 14000  
Juno Beach, FL 33408-0420

**SUBJECT: TURKEY POINT NUCLEAR POWER PLANT – NRC OPERATOR LICENSE  
EXAMINATION REPORT 05000250/2011302 AND 05000251/2011302**

Dear Mr. Nazar:

During the period December 6 – 8, 2011, the Nuclear Regulatory Commission (NRC) administered operating tests to employees of your company who had applied for licenses to operate the Turkey Point Nuclear Power Plant. At the conclusion of the tests, the examiners discussed preliminary findings related to the operating tests and the written examination submittal with those members of your staff identified in the enclosed report. The written examination was administered by your staff on December 14, 2011.

Three Reactor Operator (RO) and two Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. One RO applicant failed the written examination. There were six post-administration comments concerning the written examination. The post examination comments were identified in letters dated December 23, 2011, and January 10, 2012. These comments, and the NRC resolution of these comments, are summarized in Enclosure 2. A Simulator Fidelity Report is included in this report as Enclosure 3.

The initial written SRO examination submitted by your staff failed to meet the guidelines for quality contained in NUREG-1021, Operator Licensing Examination Standards for Power Reactors, Revision 9, Supplement 1, as described in the enclosed report. All other parts of the initial examination submittal was within the range of acceptability expected for a proposed examination. All examination changes agreed upon between the NRC and your staff were made according to NUREG-1021, Operator Licensing Examination Standards for Power Reactors, Revision 9, Supplement 1.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm.adams.html> (the Public Electronic Reading Room).

If you have any questions concerning this letter, please contact me at (404) 997-4436.

Sincerely,

*/RA/*

Mark E. Franke, Chief  
Operations Branch 2  
Division of Reactor Safety

Docket Nos. 50-250 and 50-251  
License Nos. DPR-31 and DPR-41

Enclosures:

1. Report Details
2. Facility Comments and NRC Resolution
3. Simulator Fidelity Report

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Letter to Mano Nazar from Mark E. Franke dated February 28, 2012.

SUBJECT: TURKEY POINT NUCLEAR POWER PLANT – NRC OPERATOR LICENSE  
EXAMINATION REPORT 05000250/2011302 AND 05000251/2011302

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**U.S. NUCLEAR REGULATORY COMMISSION**

REGION II

Docket No.: 50-250, 50-251

License No.: DPR-31, DPR-41

Report No.: 05000250/2011302, 05000251/2011302

Licensee: Florida Power & Light Company (FP&L)

Facility: Turkey Point Nuclear Plant, Units 3 & 4

Location: 9762 S. W. 344<sup>th</sup> Street  
Florida City, FL 33035

Dates: Operating Test – December 6 – 8, 2011  
Written Examination – December 14, 2011

Examiners: Edwin Lea, Chief Examiner, Senior Operations Examiner  
Craig Kontz, Senior Project Engineer  
Dan Bacon, Operations Engineer  
Andreas Goldau, Operations Engineer (Training)  
Amanda Toth, Operations Engineer (Training)

Approved by: Mark E. Franke, Chief  
Operations Branch  
Division of Reactor Safety

## SUMMARY OF FINDINGS

ER 05000250/2011302, 05000251/2011302, 12/6 – 8/ 2011; Turkey Point Nuclear Station; Operator License Examinations.

Nuclear Regulatory Commission (NRC) examiners conducted an initial examination in accordance with the guidelines in Revision 9, Supplement 1, of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." This examination implemented the operator licensing requirements identified in 10 CFR §55.41, §55.43, and §55.45, as applicable.

Members of the Turkey Point Nuclear Plant staff developed both the operating tests and the written examination. The initial senior reactor operator (SRO) written examination submittal did not meet the quality guidelines contained in NUREG-1021.

The NRC administered the operating tests during the period December 6 – 8, 2011. Members of the Turkey Point Nuclear Station training staff administered the written examination on December 14, 2011. Three Reactor Operator (RO) and two SRO applicants passed both the operating test and written examination. Two RO applicants and two SRO applicants were issued licenses commensurate with the level of examination administered. One RO applicant passed the operating test, but passed the written examination with an overall score between 80% and 82%. The one RO applicant was issued a letter stating that they passed the examination and issuance of their license has been delayed pending any written examination appeals that may impact the licensing decision for their application. One RO applicant passed the operating test, but failed the written examination.

There were six post-examination comments.

No findings were identified.

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA5 Operator Licensing Examinations

##### a. Inspection Scope

Members of the Turkey Point staff developed both the operating tests and the written examination. All examination material was developed in accordance with the guidelines contained in Revision 9, Supplement 1, of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." The NRC examination team reviewed the proposed examination. Examination changes agreed upon between the NRC and the licensee were made per NUREG-1021 and incorporated into the final version of the examination materials.

The NRC reviewed the licensee's examination security measures while preparing and administering the examinations in order to ensure compliance with 10 CFR §55.49, "Integrity of examinations and tests."

The NRC examiners evaluated four Reactor Operator (RO) and two Senior Reactor Operator (SRO) applicants using the guidelines contained in NUREG-1021. The examiners administered the operating tests during the period December 6 – 8, 2011. Members of the Turkey Point Nuclear Power Plant training staff administered the written examination on December 14, 2011. Evaluations of applicants and reviews of associated documentation were performed to determine if the applicants, who applied for licenses to operate the Turkey Point Nuclear Power Plant, met the requirements specified in 10 CFR Part 55, "Operators' Licenses."

##### b. Findings

The NRC determined that the licensee's written SRO examination submittal was outside the range of acceptable quality specified by NUREG-1021. The initial written SRO examination submittal was outside the range of acceptable quality because more than 20% [10 out of 25] of the questions contained unacceptable flaws. Individual questions were evaluated as unsatisfactory for the following reasons:

- One question failed to meet the K/A statement contained in the examination outline.
- Four questions contained two or more implausible distractors.
- Four questions on the SRO examination were not written at the SRO license level.
- One question did not provide any discriminatory value, i.e., level of difficulty equal to 1.

The NRC determined that the licensee's initial operating test submittal was within the range of acceptability expected for a proposed examination.



Three RO applicants and two SRO applicants passed both the operating test and written examination. One RO applicant passed the operating test but did not pass the written examination. Two RO applicants and two SRO applicants were issued licenses. One RO applicant passed the operating test, but passed the written examination with an overall score between 80 percent and 82 percent. The one RO applicant was issued a letter stating that they passed the examination and issuance of their license has been delayed pending any written examination appeals that may impact the licensing decision for their application.

Copies of all individual examination reports were sent to the facility Training Manager for evaluation of weaknesses and determination of appropriate remedial training.

The licensee submitted six post-examination comments concerning the written examination. A copy of the final written examination and answer key, with all changes incorporated, and the licensee's post-examination comments may be accessed not earlier than January 7, 2014, in the ADAMS system (ADAMS Accession Numbers ML120090385, ML120090388, and ML120090369).

#### 40A6 Meetings, Including Exit

##### Exit Meeting Summary

On December 9, 2011, the NRC examination team discussed generic issues associated with the operating test with Mr. Mark Jones, Operations Manager, and members of the Turkey Point Staff. The examiners asked the licensee if any of the examination material was proprietary. No proprietary information was identified.

### **KEY POINTS OF CONTACT**

#### Licensee personnel

M. Jones, Operations Manager  
 N. Constance, Training Manager  
 B. Heidecker, Training Instructor  
 S. Mihalakea, Licensing  
 M. Similey, Initial Training Supervisor  
 B. Stamp- Operations Training Supervisor  
 M. Wilson, Training Instructor

#### NRC personnel

M. Junge, Branch Chief (Acting)

## FACILITY POST-EXAMINATION COMMENTS AND NRC RESOLUTIONS

A complete text of the licensee's post examination comments can be found in ADAMS under Accession Number ML120093609.

### RO QUESTION # 3

**Comment:** The licensee requested that this question be deleted from the exam. The licensee contended that the word “controlled”, which was used in the stem of the question, was ambiguous because it implied that RCS subcooling was required to be maintained within a specific band. During the administration of the exam, one applicant asked the proctor if the word “controlled” meant the same thing as “monitored and ensured” or “minimized.” The proctor response, as agreed to by the NRC, was to “answer the question with the information provided.” Additionally, the licensee contended that the question was beyond the normal knowledge and abilities for a reactor operator.

**NRC Resolution:** Recommendation not accepted. Question #3 tested the applicants' knowledge of the reason for controlling subcooling during the RCS depressurization in ES-1.2, Post-LOCA Cooldown and Depressurization. The high-level statement of Step 26 was:

**26**

#### Depressurize RCS To Minimize RCS Break Flow

- a. Use normal PRZ spray
  - a. Use one PRZ PORV. IF no PORV available, THEN use auxiliary spray.
  - b. Check the A and B 4KV buses - ENERGIZED BY OFFSITE POWER
  - b. Check diesel capacity adequate to energize all PRZ heaters (450 KW for each backup heater group). IF adequate diesel capacity is NOT available, THEN locally open individual heater breakers until PRZ heater load is within diesel capacity. Refer to ATTACHMENT 2, for component KW load rating.
  - c. Turn on PRZ heaters as necessary to stop depressurization
  - d. Depressurize RCS until either of the following conditions satisfied
    - \* PRZ level - GREATER THAN 71%[50%]
- OR
- \* RCS subcooling based on core exit TCs - LESS THAN 40°F[220°F]

When reducing RCS pressure, the crew is required to maintain a safe “buffer” of RCS subcooling margin, i.e., “control” subcooling above 40 °F. After the safety injection (SI) reduction sequence had been completed, the RCS can be depressurized until RCS subcooling approaches a minimum value. The wording of the high-level statement at Step 26 is slightly different from the Westinghouse Owner’s Group (WOG) Emergency Response Guideline

Background Information, Step 14, which is “*Depressurize RCS to Minimize Subcooling.*” The purpose statement for this step, as listed in the WOG background document, is “*PURPOSE: To minimize break flow by reducing subcooling.*” Therefore, the word “controlled” was not ambiguous and Choice “B” was the correct choice.

Choice “A” (to ensure continued RCP operation) was incorrect because the stem provided information that normal spray was in service (RCP was running), Safety Injection pumps had been manually overridden “off”, and that the crew was cooling down and depressurizing the RCS; therefore, the applicant was expected to discern that the plant status was already beyond Step 11.

## 11

### Check If An RCP Should Be Started

- |  |   |
|--|---|
| <p>a. All RCPs - STOPPED</p>   | <p>a. Perform the following:</p> <p>1) Stop all but one RCP.</p> <p>2) Go to Step 16.</p> |
| <p>b. RCS subcooling based on core exit TCs - GREATER THAN 30°F[210°F]</p> | <p>b. Go to Step 28.</p>  |
| <p>c. PRZ level - GREATER THAN 29%[50%]</p>                                | <p>c. Observe CAUTION prior to Step 10 <u>AND</u> return to Step 10.</p>                  |

At Turkey Point, normal spray is obtained from either of the RCS loop B or C cold legs when an RCP is operating. Therefore, the applicant was expected to discern that the plant status matched the major action category associated with depressurizing the RCS to minimize RCS leakage, NOT starting an RCP. Choices “C” and “D” were incorrect because they both contained the word “challenge”, which implied either a red or orange path. The stem of the question indicated that the crew had purposely stopped the Safety Injection (SI) Pumps to cool down the plant and depressurize the RCS. Based on the conditions provided in the stem, the crew had more than adequate cooling flow based on the fact that the SI pumps were manually overridden off. Choices “C” and “D” could not be correct unless the applicant made assumptions well beyond those provided in the stem. Therefore, the only reason for controlling subcooling during the major action category of “Depressurize RCS to Minimize RCS Leakage” was to minimize RCS Leakage.

The licensee further contended that the question was beyond the knowledge required for a reactor operator; however, the Turkey Point Post LOCA Cooldown and Depressurization lesson plan (6902329) contained the following reactor operator learning objective:

*Obj #4: EXPLAIN the major action categories of ES-1.2*

Section 3.3 (Major Action Categories) of the lesson plan listed the following six major action categories:

- *Prepare for and initiate RCS Cooldown*
- *Depress RCS to Refill PZR*
- *Start One RCP/Stop All But One RCP*
- *Reduce SI Flow*
- ***Depress RCS to Minimize RCS Leakage***
- *Perform Other Long Term Recovery Actions*

The ES-1.2 major action categories were the overall mitigative strategy of ES-1.2; therefore, this was reactor operator knowledge level.

### RO QUESTION # 17

**Comment:** The licensee requested that two answers be accepted for this question. The licensee contended that two procedures provided guidance for a controlled cooldown of the RCS using Residual Heat Removal (RHR); therefore, the licensee recommended accepting Choices “B” and “D” as correct answers.

**NRC Resolution:** Recommendation not accepted. The Foldout Page in ONOP-13, Loss of Instrument Air, provided the following guidance in the Response Not Obtained (RNO) column of Step 13:

- e. **IF** RCS cooldown in progress,  
**THEN** monitor RCS cooldown **AND**  
start or stop the RHR Pump(s) as  
necessary to maintain the  
cooldown/heatup within limits

The licensee contended that Choice “D” was also correct because Step 4.8.7 in 3-OP-050, Residual Heat Removal System, provided the following guidance:

- 4.8.7 If throttling of the CCW side of the RHR Hx is required to limit a cooldown due to problems with FCV-3-605 or HCV-3-758, the following apply:
1. Only MOV-3-749A or MOV-3-749B shall be used to prevent invalidating the CCW System flow balance.
  2. A minimum of 1,000 gpm CCW flow as indicated on ultrasonic flow instrument shall be maintained for the Heat Exchanger with reduced flow.
  3. The CCW Surge Tank shall be monitored to prevent overflowing the surge tank due to the expansion of water in the RHR Hx.
  4. The System Engineer is aware of the need to change CCW valve positions.

The guidance listed in 3-OP-050, Step 4.8.7 applied during a situation when the Component Cooling Water (CCW) was required to be throttled to limit a cooldown. The stem of the question required that applicants to complete the fill-in-the-blank statements in accordance with ONOP-013, which provided guidance for controlling the RHR side of the heat exchanger. Choice “D” is incorrect because the stem of the question specified ONOP-013 to control the RHR side of the heat exchanger. Choice “B” is the only correct answer.

**RO QUESTION # 53**

**Comment:** The licensee requested that this question be deleted from the exam because it tests knowledge beyond the normal knowledge and abilities for a reactor operator. The licensee's contention was that the licensed operators at Turkey Point are not required to memorize all alarm setpoints for control room annunciators.

**NRC Resolution:** Recommendation not accepted. The Component Cooling Water (CCW) System Lesson Plan (6902140) listed the following reactor operator learning objective:

*Objective 7.c: EVALUATE the setpoints, coincidence and operational significance of alarms associated with the CCW System, including:*

- a. *CCW System Load Low Flow Alarms (H-7/5)*

The Containment Spray System Lesson Plan (6902125) listed the following reactor operator learning objective:

*Objective 7.d: DESCRIBE the interrelations between the Containment Spray System and the following:*

- b. *Component Cooling Water*

Section 2.0 of the Containment Spray System lesson plan listed the following information:

*D. Mechanical Seals*

- d. *CONTAINMENT SPRAY PUMPS COOLING WATER LOW FLOW alarm*
  - 1) *7.7 gpm decreasing*
  - 2) *H-7/5*

Section 3.6 (System Interrelationships) of the Containment Spray lesson plan listed the following information:

*"Component cooling water cools the CSP mechanical seal heat exchanger. Loop A of the component cooling water system supplies CS pump A while loop B supplies CS pump B. A component cooling water low flow condition to the CS pumps seal water heat exchanger is indicated by a common alarm."*

The Containment Spray System operating procedure (3/4-NOP-068) provided the following Caution:

*"Throttle valves are preset to establish design basis flow rates and should NOT be operated. Repositioning of the throttle valves may affect CCW System operability and should NOT be performed without System Engineer evaluation."*

The CCW operating procedure (3/4-NOP-030), Precaution and Limitation (P&L) 2.2.1.8, listed the maximum allowed CCW flow rate to a Containment Spray Pump Seal Water heat exchanger. Additionally, Attachment 4, Component Cooling Water Flow Rates, listed the flow

adjustment valves and the normal operating CCW flow rates (gpm) for the containment spray pump seal water heat exchangers.

Question # 53 was reviewed, validated, and approved by Operations and Training Management for the NRC to make a licensing decision by virtue of their final written exam submittal package to the NRC. NUREG 1021, Revision 9, Supplement 1, ES-403, Section D.1.b states:

*“Given that both the NRC and the facility licensee agreed that the examination met NUREG-1021 prior to the examination administration, the following types of question errors, identified after examination administration, are less likely to result in examination changes:*

- *a question for which references would be needed to provide the correct answer, even though the facility licensee and the NRC previously agreed that the question should be closed-reference.”*

10CFR55.41, Written Examination: Operators, Items (7) requires testing operator applicant knowledge of design, components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. The Containment Spray System is safety system used to spray cool water into the containment atmosphere when appropriate in the event of a loss-of-coolant accident. The containment spray pump (CSP) has mechanical seals which are cooled by CCW. The CCW cooling is critical to eliminate seal leakage, which would be radioactive during the recirculation phase of an accident.

The question required the applicants to recognize 1) a pre-adjusted component cooling water (CCW) flow rate and 2) low CCW flow annunciator setpoint for a containment spray pump’s (CSP) seal water heat exchanger. Cooling water to safety related equipment, including the instrumentation (annunciators), signals, interlocks, and failure modes is the design of the safety system, and is required to be tested in accordance with 10CFR55.41.

## **RO QUESTION # 60**

**Comment:** The licensee requested that this question be deleted from the exam because there was no absolutely correct answer. The licensee’s comment was that if the Steam Dump Mode Selector Switch was placed in the Manual position, then the steam dumps would arm; therefore, Choice “A” (Steam Dumps are reset and can ONLY be armed by a turbine trip) was not absolutely correct.

**NRC Resolution:** Recommendation accepted. The question tested the applicants’ knowledge of the *status* of the condenser steam dumps after Turbine First Stage Pressure Transmitter 3-PT-447 had failed low, and all applicable actions in 3-ONOP-049.1, Deviation of Failure of Safety Related or Reactor Protection Channels, had been completed. The following choices were provided:

- Steam Dumps are reset and can ONLY be armed by a turbine trip.**
- Steam Dumps are reset and can ONLY be armed by a load reject.
- Steam Dumps are armed and will actuate if Tave exceeds Tref by 9.5 °F
- Steam Dumps are armed and, if actuated, will close when Tave is within 5 °F of Tref.

Any of the following signals will arm the steam dumps:

- Load rejection signal derived from PT-447
- Steam Dump Mode Selector Switch in the MANUAL position.
- Turbine trip signal derived from either auto stop oil pressure switches or turbine stop valves.

In the case of Question #60, PT-447 had failed low and the required operator action in accordance with 3-ONOP-049.1, was listed in Step 5.14:

**NOTE**

*The following step is to allow automatic operation of the Steam Dump to Condenser System during a turbine trip subsequent to a failure of PT-3-447, First Stage Pressure Channel.*

- 5.14 **IF** First Stage Pressure Channel, PT-3-447 has failed **AND** Steam Dump to Condenser has armed, **THEN** place the Steam Dump to Condenser Mode Selector switch to RESET and return to AUTO.

Once the Steam Dump to Condenser Mode Selector switch had been placed to the RESET position, the steam dumps were no longer armed and could no longer be armed from a load rejection signal. However, the steam dumps could still be MANUALLY armed if the operator placed the Mode Selector Switch to the MANUAL position. The wording of Choice "A" did not sufficiently distinguish between automatically arming vs manually arming. Therefore, Question # 60 was deleted from the exam.

**RO QUESTION # 61**

**Comment:** The licensee requested that this question be graded with two correct answers. The licensee's comment was that the stem of the question did not specify which S/G level indication was being tested, that is, "indicated S/G level" did not specifically refer to the Narrow Range S/G level or Wide Range S/G level. The licensee contends that the Narrow Range S/G level indication initially lowered after the respective MSIV had closed whereas the Wide Range S/G level indication initially rose. The licensee substantiated these level indication differences on the plant referenced simulator.

**NRC Resolution:** Recommendation accepted. The two-part question asked for the initial effect of closing 4A Main Steam Isolation valve on the 4A S/G indicated level, and the initial effect on 4B and 4C Feedwater Regulating Valve Position. The position of the reference leg tap for Narrow Range level indicators was near the feedwater nozzles, which resulted in the level indication phenomena commonly known as "shrink and swell." The position of the reference leg tap for Wide range levels at the bottom of the S/G did not produce this "shrink and swell" phenomenon. Therefore, the initial response to a sudden change in steam flow from the closure of a MSIV had an opposite effect on the indicated level readings on Narrow Range versus Wide Range. Since the question stem did not specify whether the level indication referred to was Narrow Range or Wide Range level indication, the applicant could assume either; therefore, both answers "A" and "D" were correct.

**SRO QUESTION # 80**

**Comment:** The licensee requested that the answer key be changed to reflect "A" as the correct answer (instead of "C"). The licensee contended that the original answer key ("C") was incorrect because the correct answer for second part of the question, based on EOP procedure routing with Subcooling less than 50 degrees, was "A."

**NRC Resolution:** Recommendation accepted. The second part of the question included the following fill-in-the-blank statement:

*If below the required RCS Subcooling for 4-EOP-E-3, then transition to \_\_\_\_\_ .*

The fill-in-the-blank statement tested the applicants' ability to determine whether to transfer to 4-EOP-ECA-3.1 versus EOP-ECA-3.3, when RCS subcooling was less than 50 degrees. The step in 4-EOP-E-3 which directed transferring to EOP-ECA-3.1 was the "Response Not Obtained" (RNO) column of step 21. Step 21 was listed before the step 23 RNO column, which contained the (incorrect) guidance to transfer to EOP-ECA-3.3. The original answer key incorrectly listed the correct answer as "C" (EOP-ECA-3.3). Choice "A" was the only correct answer based on the precise wording of the fill-in-the-blank statement.



## **SIMULATOR FIDELITY REPORT**

Facility Licensee: Turkey Point Nuclear Power Plant

Facility Docket No.: 50-250 and 50-251

Operating Test Administered: December 6 – 8, 2011

No simulator fidelity or configuration issues were identified.