



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W., SUITE 2900  
ATLANTA, GEORGIA 30323-0199

Report No.: 50-302/94-23

Licensee: Florida Power Corporation  
3201 34th Street, South  
St. Petersburg, FL 33733

Docket No.: 50-302

License No.: DPR-72

Facility Name: Crystal River 3

Inspection Conducted: November 28 - December 16, 1994

Inspector: Michael E. Ernstes 1/4/95  
Michael E. Ernstes Date Signed

Accompanying Personnel: Jonathan Bartley

Approved by: Lawrence L. Lawyer 1/5/95  
Lawrence L. Lawyer, Chief Date Signed  
Operator Licensing Sections  
Operation Branch  
Division of Reactor Safety

SUMMARY

Scope:

The NRC conducted a routine, announced inspection of the Crystal River licensed operator requalification program during the period November 28 - December 16, 1994. The inspectors reviewed and observed annual requalification examinations conducted by the facility licensee and conducted inspection activities as specified in Inspection Procedure 71001. Activities reviewed included examination development, examination administration, remedial training, and license condition tracking.

Results:

The inspectors identified an inspector follow-up item concerning the inadequate size and quality of the JPM examination bank. (paragraph 2.a.2)

The inspectors identified an inspector follow-up item concerning ineffective individual operator evaluations during simulator exercises during the annual operating examinations. (paragraph 2.b.2)

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Enclosure

Inspectors identified weaknesses in operator performance in the areas of conduct of operations, EOP usage and transition, control board operations, and off-site dose assessment. (paragraph 2.c)

Inspectors identified a non-cited violation for the failure to complete adequate plant tours during license re-activation. (paragraph 2.f)

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*P. Beard, Senior VP, Nuclear Operations
- \*J. Bufe-Carr, Nuclear Licensing Specialist
- \*R. Davis, Manager, Nuclear Plant Maintenance
- \*G. Halnon, Manager, Nuclear Plant Operations
- \*L. Kelly, Director, Nuclear Operator Training
- \*J. Lind, Manager Nuclear Operator Training
- \*P. McKee, Director, Quality Programs
- \*J. Smith, Supervisor Nuclear Operator Training
- \*J. Springer, Supervisor Nuclear Support
- \*R. Widell, Director, Nuclear Operations Site Support

Other licensee employees contacted included instructors, operators, and office personnel.

#### NRC Personnel

- \*L. Lawyer, Chief, Operator Licensing Section
- \*R. Butcher, Senior Resident Inspector

\*Attended exit interview

### 2. Licensed Operator Requalification Program Evaluation (71001)

#### a. Examination Development

##### (1) Written Examination

The facility developed the written examinations in accordance with NUREG-1021, Examiner Standard (ES) 602. The static questions adequately tested the operators' ability to apply system and procedures knowledge to the existing simulated plant conditions. The open reference questions required an appropriate use of references. Operators needed to use analysis skills or synthesis of information to determine the answers.

##### (2) Walkthrough Examinations

The Job Performance Measure (JPM) Initiating Cues given to the operators were so focused that the JPMs did not evaluate the operator's ability to identify the appropriate procedure or procedure section for a given set of conditions. The initiating cue to the operators included the procedure and step numbers to perform. The operator generally only needed to locate and turn switches or valves.

Many JPMs lacked the difficulty needed to evaluate an operator's knowledge and ability in order to identify areas in need of retraining. Element four of a Systems Approach to Training (SAT)

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based program as defined by 10 CFR 55.4 is evaluation of trainee mastery of the objectives during training. NUREG-1220, "Training Review Criteria and Procedures," states that a characteristic of this element is that continuing training contains performance requirements for difficult, important, or infrequent tasks. The majority of JPMs utilized during the third week of examinations were simplistic and could not be considered difficult tasks.

Each operator walkthrough examination contained five JPMs. The facility administered only one alternate path JPM during the requalification evaluation. The licensee gave the same JPM each week to half of the operators. The JPM bank contained only six alternate path JPMs. TDP-106, "Examination Preparation, Administration and Control," paragraph 5.4.1.2 states that the walkthrough examination of Phase 3 of the LORT Program shall be similar in level of difficulty, length, content and format to the walkthrough portion of the NRC Requalification Examination as described in ES-601 of NUREG 1021. ES-603 Attachment 1 of NUREG-1021 states that licensees are expected to be able to use alternative methods to perform tasks. Alternate path JPMs test the operator's ability to use procedures under abnormal conditions. They also preclude operators from rote memorization of the JPM examination bank instead of acquiring understanding of the task.

Each SRO who did not make an Emergency Plan classification during the simulator examination received a JPM to test their ability to classify events based on plant conditions. There were only five classification JPMs in the bank. Seven of twenty-three SROs received the same Emergency Plan classification JPM in 1994 that they did in 1993. Repeating test items does not effectively evaluate an operator's ability to make an Emergency Plan classification.

The above problems with the JPMs reduced their effectiveness as an evaluation tool. The inspectors identified the size and quality of the JPM examination bank as IFI 50-302/94-23-01.

### (3) Simulator Examinations

The licensee did not vary the Simulator Examination Scenario (SES) initial conditions enough to preclude the student from anticipating some of the malfunctions. For example, SES-27 had high RCS activity as an initial condition. Before one of the crews even started the scenario the Shift Operations Technical Assistant (SOTA) reminded the crew of the steaming limits associated with high activity from EOP-6, "Steam Generator Tube Rupture." The determination of maximum allowable steaming time to atmosphere was one of the critical tasks. A review of the simulator examination bank showed that SES-27 was the only scenario with high RCS activity as an initial condition. Inspectors also noted that scenarios with an Emergency Feedwater

	week 1	week 2	week 3
JPM #124	3/10 (30%)	1/12 (8%)	0/7 (0%)
JPM # 3	2/10 (20%)	N/A	0/7 (0%)
JPM #83	N/A	1/3 (33%)	0/2 (0%)
All JPMs	7/95 (7.4%)	2/70 (2.9%)	1/67 (1.5%)
Repeated JPMs	5/38 (13%)	2/17 (12%)	0/27 (0%)

Evaluators inconsistently administered JPMs. One evaluator read the Initiating Cue; another required the operator to read it. One evaluator did not require the demonstration of how to open a breaker. An operator said "I would open the lock, remove it and energize it." The other operators described the exact position in which the breaker handle must be positioned.

One simulator operator gave inappropriate cues. JPM #124 called for the operator to perform a plant start up in which the reactor went critical early, requiring the operator to insert rods. During the JPM, one operator reported to the simulator operator, acting as the Shift Supervisor on Duty (SSOD), that he had 900 counts on the Source Range (SR). Instead of simply acknowledging the information the simulator operator asked, "What [count rate] did you start at?" This served as a reminder of the step in OP-210, "Reactor Startup," to discontinue the start up if SR count rate reaches 30 times the initial count rate. Later in the JPM the operator reported "it looks like I'm going to go [critical] early." Instead of acknowledging the information the simulator operator reminded the operator, "If you go critical early, comply with the OP." Since OP-210 detailed the actions for early criticality, this again served as a cue to the operator. Cues of this type hinder the ability to evaluate an operator.

## (2) Simulator Examinations

The licensee mainly used crew critical tasks to determine pass/fail criteria on the simulator examinations. This method is in accordance with Revision 7 of NUREG-1021, the Examiner Standards. The NRC developed the critical task methodology to ensure NRC examiners gave consistent evaluations of the crews' ability to operate the plant safely. The critical task method is not designed to determine areas in which retraining is needed to upgrade licensed operator knowledge as required by 10 CFR 55.59(c)(4)(i).

The use of crew critical tasks hindered identification of individual operator areas in need of improvement. When an



(EFW) pump out of service always led to feedwater complications requiring operator action. Although abnormal conditions in the initial conditions are desirable, efforts need to be made to ensure they do not render the scenario predictable.

b. Examination Administration

(1) Walkthrough Examinations

While conducting JPMs, the evaluators did not give the operators complete copies of the procedures. The evaluator supplied only the pages of the procedure with the steps to be performed. This did not reflect conditions under which operators actually perform tasks. In a real situation, an operator is generally given a verbal order and reviews the precautions and limitations and selects the appropriate portion of the procedure. Giving only a portion of the procedure has a potential for negative training if, during the evaluations, they do not need to review precautions. Giving operators focused portions of procedures hinders the evaluation of the operators' ability to use procedures. During interviews, operators described the JPMs as, "cook book," in that one does not need to understand the evolution but just be able to read the steps and locate the components. Some operators felt that the only way a person fails JPMs is to panic or read a step wrong.

There was a disparity between performance expectations and the performance standard used on the walkthrough examinations. The initiating cue of JPM #3 directed the operator to perform Emergency Safeguards actuation verification in accordance with EOP-03, "Inadequate Subcooling Margin," step 3.5. The evaluator handed the operator a copy of the procedure step. However, step 1.5 of AI-505, Enclosure 1, "Procedural Items Which Licensed Operators Must Have Committed to Memory," states that licensed operators must be able to determine expected equipment response to an Emergency Safeguards actuation from memory using the status lights. The licensee expected operators to perform this task from memory but evaluated them differently.

The small number of JPMs in the bank resulted in JPMs being repeated in subsequent examination weeks. The JPMs became a less effective evaluation tool each week since operators became aware of problems encountered during failed JPMs. The licensee administered the same alternate path JPM, #124, each week. Other JPMs which operators failed, were not failed in subsequent weeks. The table below compares the failure rates for JPMs for each of the three weeks and shows a significantly lower failure rate during subsequent weeks.

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The use of crew critical tasks hindered identification of individual operator areas in need of improvement. When an

operator made an error either through commission or omission, the evaluators did not document it if other crew members compensated and prevented plant damage. Additionally the evaluators asked follow-up questions to the crew as a group. This hindered the ability to determine individual operator's knowledge of the plant status, system interactions and mitigation strategy. Group questions masked any communication problems or individual misunderstandings since one person answered for the crew. With the strongest operator answering all of the questions, the evaluators could only identify individual areas for retraining by directly observing operator errors which led to an effect on the plant. Part 55.59(a)(2)(ii) of title 10 of the Code of Federal Regulations states that the requalification annual operating test will require the operator or senior operator to demonstrate an understanding of and the ability to perform a comprehensive sample of items specified in §55.45(a)(2) through (13). By concentrating on the crew critical tasks, the evaluators did not recommend retraining for operators who passed the examination but still demonstrated weak areas. The inspectors identified the licensee's ineffective individual operator evaluations during simulator examinations as IFI 50-302/94-23-02.

The licensee evaluators did not observe all of the operators' actions. The licensee had one evaluator watch both the SSOD and the CNO. An NRC inspector observed the Chief Nuclear Operator (CNO) during a portion of one scenario. This RO could not complete a Shutdown Margin (SDM) calculation. He spent 12 minutes paging through procedures when the SSOD directed him to make an Emergency Notification. The CNO could not determine stability class from EM-204A, "Off-Site Dose Assessment during Radiological Emergencies," and reported it as unavailable. After completing his Emergency Notifications, he informed the SSOD that he would then complete his SDM calculation. This was despite the fact that the plant had tripped making the SDM meaningless. The facility evaluators did not identify any of these deficiencies. Since these tasks were not critical, the evaluators did not identify the operator's inability to complete a SDM or determine stability class as areas needing retraining.

#### c. Operator Performance

Inspectors identified weaknesses in operator performance in the areas of conduct of operations, EOP usage and transition, control board operations and off-site dose assessment.

Operators did not adhere to the guidance of AI-505, "Conduct of Operations during Operational and Emergency Events." Crews did not use Formal Control Room protocol as required by step 4.2.1.4. in that there was no designation of the Procedure Director. The Procedure Director did not always notify the control room personnel of procedure transitions as stated in step 4.2.2.1. Control board operators did not acknowledge that they understood commands as in step 4.2.3.7.

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Crews inconsistently used the Plant Status Briefings described in section 4.2.4. Although some crews effectively utilized the briefings to focus the crew and exchange information, one crew did not hold any briefings. In a scenario involving an OTSG tube leak, the SSOD was unaware that the crew was depressurizing the OTSG with an atmospheric dump. Procedure Directors did not read cautions and notes out loud to the crews. Not all crews announced the starting of major plant equipment. One SSOD removed himself from plant oversight by becoming involved with Emergency Plan implementation and calls.

SROs made errors in Procedure use and EOP transition. In SES-7, the crew consciously allowed an automatic Emergency Safeguards actuation on low RCS pressure while cooling down using EOP-06, "Steam Generator Tube Rupture." Step 3.34 of EOP-06 directed bypassing the actuation prior to receiving it. In SES-4 while in EOP-04, "Inadequate Heat Transfer," the crew lost subcooling margin and transitioned to EOP-03 "Inadequate Subcooling Margin." Step 3.11 of EOP-04 directed staying in EOP-04 if subcooling is lost. In SES-27, the crew did not isolate letdown by closing MUV-49 in step 3.3 of EOP-06 with pressurizer pressure less than 100 inches.

Poor control board operations complicated some of the scenario events. In SES-27, the RO failed to maintain control of plant cooldown. The cooldown rate went to zero and the plant began to heat up which caused the pressurizer to fill due to HP injection having been adjusted to accommodate the cooldown. In the same scenario, the Assistant Nuclear Shift Supervisor (ANSS) directed an RO to cooldown using the A OTSG turbine bypass valves, the operator opened the atmospheric dump valves until corrected by the other RO. Another crew needed to reduce power to remove an RCP with a failed first stage seal. The crew was unable to reduce power in a timely manner to allow the pump to be tripped. The delay resulted in an ICS runback which could have been avoided.

Operators exhibited trouble in filling out EM-204A, "Off-Site Dose Assessment during Radiological Emergencies," data sheets. In SES-7 the RO assigned to fill out the data sheets had difficulty using the computer program. The SSOD had to walk him through the process of completing EM-204A on the computer. Another RO could not determine stability class and reported it as unavailable.

#### d. Remediation and Retesting

Although the evaluators identified some operator areas for improvement, the operators did not receive retraining unless the operators reached the fail or SAT with remediation threshold. Operators who passed the examinations did not receive any structured retraining on demonstrated weaknesses. The evaluators did not document many of the operator performance problems identified in paragraph 2.c since the crew passed the critical tasks. One example of a lack of retraining was in SES-7, where the B OTSG Atmospheric Dump Valve (ADV) remained open for sixteen minutes causing excessive plant cooldown. The ANSS and ROs had forgotten the ADV was

open and were not sure if the cooldown had been stopped until the SSOD directed the ANSS to close or block the ADV. The evaluators did not recommend any operator remediation for leaving the ADV open with an OTSG tube leak because the level of radiation in the primary was low. This was a serious competency problem that the evaluators did not address since the crew completed the critical task. The operators received a grade of satisfactory for all competencies. The evaluators made no documented comments and recommended no remediation.

Inspectors reviewed the documentation of the remediation given to operators who had failed examinations. The licensee tailored the remediation to the weaknesses identified in the failed portion of the examination. Interviews with the operators indicated that the Training Department and Manager, Nuclear Plant Operations (MNPO) effectively administered the retraining and retested the operator to ensure they had corrected the weaknesses.

e. Plant and Procedures.

Step 4.19.2 of OP-605, "Feedwater System," said "unlock and close EFV-36." During the performance of in-plant JPM 121, there was no lock on EFV-36. Neither the evaluator nor the operators questioned this. When the inspector asked, the evaluator thought that they had removed some of the locks and that must be one of them. The operators and evaluator demonstrated a lack of questioning attitude as to the disparity between the procedure and the as-found plant status. The Resident Inspector determined that the procedure was in error and that the valve did not need a lock.

The inspectors identified a lack of concern on the part of one operating crew for releasing radioactivity to the environment during plant events. EOP-06, "Steam Generator Tube Rupture," allowed steaming a ruptured generator to atmosphere based on B&W analysis for dose equivalent iodine not exceeding 10 CFR 100 limits. The analysis was based on the fact that it is faster to cooldown using two OTSGs to stop the primary to secondary leakage than one OTSG due to tube-to-shell delta-T limits. This results in a lower integrated dose. During a scenario with high RCS activity and a steam generator tube rupture, one crew unnecessarily steamed the ruptured generator at the maximum rate since they would not "get credit" for a low steaming rate with regard to the analyzed limits. This showed a lack of concern for minimizing radioactive releases. Another crew performed the same scenario later that day. The second crew showed the proper concern for minimizing releases by steaming the good generator at the maximum rate and steaming the faulted generator only as required to maintain the required cooldown rate. The facility evaluators did not discuss the difference in philosophy between the two crews nor did they comment on the first crew's philosophy for responding to the event. The inspectors identified their concern to the MNPO. The MNPO agreed that the first crew's lack of concern for minimizing radioactive releases during plant events was not desirable and issued guidance to the operators stating management's expectations.

## f. Conformance with License Conditions

10 CFR 55.43(f) requires operators with an inactive license to conduct a complete plant tour prior to resuming active license duties. Contrary to this requirement, the licensee identified that not all operators conducted a complete plant tour. The licensee developed guidance to ensure operators conduct a complete plant tour as part of their license reactivation. The inspectors identified this violation as NCV 50-302/94-23-03. This violation will not be subject to enforcement action because the licensee's efforts in identifying and correcting the violation meet the criteria specified in Section VII.B of the Enforcement Policy.

The licensee had no method in the control room to determine operators' license conditions. Interviews with SROs on watch indicated that there was nothing available to them to determine an operators' license conditions or active license status. Although the individual operator is responsible for meeting the requirements of his or her license, 10 CFR 50.54(i) requires that the licensee allow only individuals who are licensed in accordance with 10 CFR 55 to manipulate controls. The licensee had no means to ensure non-licensed operators did not willfully or inadvertently assume licensed duties.

## 3. Action on Previous Inspection Findings (92901)

(Closed) VIO 50-302/93-20-01, Failure to notify the NRC within 30 days of the change in the medical status of a licensed operator. The inspectors reviewed the new form that Health Services personnel use to transmit physical examination results to the Training Department. The form contained a check block noting any license restrictions which have changed since the last physical examination. This serves as a flag for Training Department personnel that the NRC must be notified in order to amend an individual's license. This Violation is closed.

(Closed) VIO 50-302/93-20-02, Failure to provide safeguards against tampering with official records. This item concerned the use of correction fluid on licensed operator medical records. The inspectors interviewed personnel from the licensee's Health Services office and reviewed selected medical records. The inspectors determined that interoffice correspondence instructed personnel responsible for medical records to line out and initial mistakes and to not use correction fluid. The inspectors reviewed changes to medical records made since November 11, 1993, and found that personnel made all corrections by lining out and initialing the errors. This Violation is closed.

(Closed) IFI 50-302/93-20-03, Licensed operator has three unnecessary medical restrictions on his license. This item concerned unnecessary restrictions on an operator's license. The inspectors found that the licensee submitted a letter to the NRC to remove the operator's license restrictions. This Inspector Follow-up Item is closed.

(Closed) VIO 50-302/93-20-04, Failure to provide adequate details in documentation supporting TDP-113, "Remedial Training Program," Revision 8. This item concerned the lack of details in remediation documentation to demonstrate that remedial training was adequately designed, properly reviewed, and satisfactorily accomplished. The inspectors reviewed TDP-113, Revision 9, and determined that the licensee added requirements for remedial training documentation to ensure the documentation could show that the training was adequately designed, reviewed and completed. The inspectors reviewed recent remedial training programs and found detailed documentation that clearly identified the operator weaknesses, retraining and retests required to complete the program. This Violation is closed.

#### 4. Exit Interview

At the conclusion of the site visit, the inspectors met with representatives of the plant staff listed in paragraph 1 to discuss the results of the inspection. The licensee did not identify as proprietary any material provided to, or reviewed by the inspectors. The inspectors further discussed in detail the inspection findings listed below. Dissenting comments were not received from the licensee.

<u>Item Number</u>	<u>Status</u>	<u>Description and Reference</u>
IFI 50-302/94-23-01	Open	Inadequate size and quality of the JPM bank. (paragraph 2.a.2)
IFI 50-302/94-23-02	Open	Ineffective identification of individual operator areas for retraining. (paragraph 2.b.2)
NCV 50-302/94-23-03	Closed	Inadequate plant tours for license reactivation. (paragraph 2.f)
VIO 50-302/93-20-01	Closed	Failure to notify the NRC within 30 days of changes in operator medical status. (paragraph 3)
VIO 50-302/93-20-02	Closed	Failure to provide safeguards against tampering with records. (paragraph 3)
IFI 50-302/93-20-03	Closed	Licensed operator has three unnecessary restrictions on his license. (paragraph 3)
VIO 50-302/93-20-04	Closed	Failure to provide adequate documentation to demonstrate remedial training accomplishment. (paragraph 3)