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

JAN 25 1993

Report No.: 50-302/93-02

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

Docket No.: 50-302 License No.: DPR-72

Facility Name: Crystal River Unit 3

Inspection Conducted: January 4-8, 1993

Inspector: Milton D Hunt 1/20/93
M. D. Hunt Date Signed

Accompanying Inspectors: M. N. Miller
G. R. Wiseman

Approved by: for Marvin Sapp 1/15/93
M. W. Branch, Chief Date Signed
Test Programs Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope:

This announced inspection was conducted to assess the adequacy of the licensee's responses for the concerns identified during the GL 89-10 Phase I Motor Operated Valve Inspection conducted January 6-10, 1992, (NRC Inspection Report No. 50-302/92-01). In addition, a review of the licensee's corrective action for a previous inspection finding was conducted.

Results:

In the areas inspected, violations or deviations were not identified. The licensee's response to the GL 89-10 Phase I MOV Inspection concerns was fully satisfactory. The licensee reorganized the Nuclear Plant Technical Support Department to include a new MOV Group. The new MOV Group has responsibility for controlling the MOV program and implementing the testing. In addition, the system engineers are now responsible for performing the thrust and differential pressure calculations specified in GL 89-10. Overall, the licensee's MOV Program meets the intent of the recommendations in GL 89-10. IFI 89-28-02, Possible Exposure of d-c Motor Switching Surges, was closed.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. Alberdo, Manager, Nuclear Operations
*P. Beard Jr., Senior Vice President Nuclear Operations
*J. Bellamy, Compliance Engineer
*W. Brewer, Technical Support Supervisor
*L. Cecilia, Nuclear Project Engineer
*D. Francis, Technical Training Supervisor
*E. Froats, Manager, Nuclear Compliance
*R. Fuller, Senior Nuclear Licensing Engineer
*G. Halnon, Manager, Nuclear Plant Technical Support
*B. Hickle, Director, Nuclear Plant Operations
*W. Marshall, Manager, Nuclear Plant Operations
*R. McLaughlin, Nuclear Regulatory Specialist
*A. Stern, Senior Nuclear Project Engineer
*G. Vaughn, Nuclear Project Specialist
*R. Widell, Director, Nuclear Operations Site Support

NRC Personnel

*P. Holmes-Ray, Senior Resident Inspector

*Attended exit interview

2. GENERIC LETTER (GL) 89-10 "SAFETY-RELATED MOTOR-OPERATED VALVE (MOV) TESTING AND SURVEILLANCE" (2515/109)

The Nuclear Regulatory Commission (NRC) Region II conducted a Phase I MOV inspection during January 6-10, 1992, of the Crystal River 3 Nuclear Plant (NRC Inspection Report No. 50-302/92-01). This inspection examined the licensee's response to Generic Letter 89-10, Safety-Related Motor-Operated Valve Testing and Surveillance. The inspection identified two concerns that requested the submittal of additional information by a written response and eight other concerns that no written response was requested. The licensee responded as requested to the two concerns in letter 3F0492-06, dated April 13, 1992. In addition, FPC submitted in letter 3F0992-05, dated September 18, 1992, an update to their initial response to Generic Letter 89-10. The purpose of this inspection was to review the licensee's actions taken for each of the concerns identified in the GL 89-10 Phase I MOV Inspection report and the responses submitted in their letters. Each concern is listed and discussed below.

The first part of each section lists the concern discussed in the GL 89-10 Phase I MOV Inspection report. The second part discusses the findings of this inspection.

2.a Concerns Identified - Written Response Requested (WRR)

Concern 1 (WRR)

This concern was discussed in Section 3.d of the Phase I MOV report. Based on the status of calculations and development of procedures, there was a concern that resource allocation might be insufficient to complete the program on schedule. Licensee personnel indicated there were plans to increase the engineering support to the program.

The inspectors verified that the licensee has dedicated adequate resources to the MOV program as stated in their response letter. The following is the listing of those additional resources:

* A senior mechanical engineer was assigned to support the MOV program. His initial responsibilities included writing test procedures for differential pressure tests. In addition, the licensee has reorganized the Nuclear Plant Technical Support Department to include a new MOV Group. This new MOV group includes an engineering staff that is responsible for implementing and controlling the MOV program as specified in GL 89-10.

* Various system engineers have been utilized to perform the differential pressure calculations. The inspector reviewed 48 calculations that were satisfactorily performed by the system engineers. These calculations were initially performed by the NSSS supplier.

* An engineering aid has been assigned to the MOV group to provide additional administrative support.

* The inspectors verified that a consultant (field engineer) from ITI MOVATS was contracted full time during the 1992 year to support the MOV program.

* The new MOV group has taken responsibility from the Maintenance Department for MOV differential pressure testing.

* A senior management MOV Program Oversite Team was established to monitor and assure coordination in implementation of the program. The team members attended the MOV training (MOVATS) to ensure their understanding of MOV requirements.

Concern 2 (WRR)

This concern was discussed in Section 3.d of the Phase I MOV report. A listing of valves scheduled to be design-basis tested revealed that it would be acceptable to test either valve of listed similar pairs rather than test both. This is contrary to recommended action c. of GL 89-10, which indicated that each valve should be tested at design-basis pressure where practicable. This was further explained in the reply to Question 22 of GL 89-10, Supplement 1.

FPC's response to this concern indicated that their evaluation of the MOV program concluded that the design-basis differential pressure (d/p) testing needed to be expanded to include all MOVs which can be tested in place without jeopardizing plant operation or safety-related system availability.

The inspectors reviewed a listing of valves to be tested and verified that it indicated scheduled d/p testing for 48 of the 84 MOVs within the program. The inspectors reviewed flow diagrams for the Core Flooding (CF), Post Accident Sampling (CA), Feedwater (FW), Decay Heat (DH), and Makeup and Purification (MU) systems to sample the completeness of the scope of valves included in d/p testing. Thirty-six (36) MOVS were excluded from the test program and the evaluation for justification for their exclusion was reviewed. The evaluation for the excluded valves was provided in a September 10, 1992 memo (NPSE92-0429) from Nuclear Plant Systems Engineering to the plant management. This evaluation stated that three categories of valves were justified for exclusion from insitu dynamic d/p testing. These included valves whose performance under dynamic conditions are verified through normal plant operating procedures, valves where static test conditions would be the same as the dynamic conditions except in inadvertent operation, and those valves where the dynamic conditions are adverse to plant safety.

The inspectors concluded that the licensee has met the commitments in the April 13, 1992, response to NRC report 50-302/92-01 for Concern (2). Specifically, the licensee performed additional differential pressure tests to evaluate the adequacy of the MOVATS data base. Based on the sample examined, the scope of valves included in the Crystal River d/p test program appeared consistent with the recommendations of GL 89-10.

2.b Concerns Identified - No Written Response Requested (NWRR)

Concern 1 (NWRR)

This concern was discussed in Section 1 of the Phase I MOV report. The licensee's letter of response included several statements which resulted in uncertainties regarding its intent to comply with GL 89-10 recommendations. For example, the response indicated that the ability to meet schedule would be dependant on the availability of necessary documentation. The licensee is now halfway through the GL 89-10 implementation schedule and should be better able to define its ability and intentions with regard to the generic letter recommendations.

The seven statements of concern in Section 1 of the Phase I MOV report were reviewed by the inspectors to determine if appropriate action was taken by the licensee.

(1) The industry is developing MOV testing methods that could lead to unforeseen delays. There was an issue where the accuracy of the test equipment for "opening" a valve could be different than for "closing" a valve. This issue was resolved by the test equipment suppliers. EPRI

has a MOV test program that has not been completed. The licensee stated that in certain areas the EPRI data may be needed. For example, testing the unique valves that have a rotating rising stem. The licensee also stated it was not their intention to delay the schedule because of these two items.

(2) FPC plans to complete the initial testing recommended by the generic letter within the three refueling outage schedule, but it is dependant upon the availability of the necessary documentation for each MOV and the ability to perform the test without undue stress on the MOV or plant systems.

FPC responded to this concern by letter 3F0992-05 dated September 18, 1992. The letter specifically states that FPC plans to complete testing of all MOVs in the program by Refuel 9 with the exception of the testing of those valves considered for alternate testing as recommended in item f. of GL 89-10.

(3) Temperature, flow, and seismic effects were not mentioned as design basis factors that would be considered (in the design-basis review).

The initial calculations were performed by the NSSS supplier. Since then the calculations were performed by the licensee's system engineers where temperature, flow, and seismic conditions were considered.

(4) In situ differential pressure testing is intended to be used where practical.

See paragraph 2.a Concern 2 (WRR) of this inspection report.

(5) Consideration of line breaks is not part of the Crystal River 3 design-basis or of the MOV test program.

The inspector reviewed the calculations performed by the licensee's system engineers and line breaks were considered where applicable.

(6) The response was unclear regarding actions to be taken in regard to GL 89-10 recommendation item h. That item recommends that each MOV failure and corrective action taken be analyzed and documented....

See paragraph 2.b Concern 6 (NWRR) of this inspection report.

(7) The response transmittal letter stated that FPC did not plan to re-test 17 MOVs previously tested in accordance with NRC Bulletin 85-03.

The licensee stated these MOVs will be tested in accordance with the GL 89-10 MOV program.

The inspectors considered the licensee's response and actions for these seven concerns satisfactory and appropriate.

Concern 2 (NWRR)

This concern was discussed in Section 3.j of the Phase I MOV report. The continuing (refresher) training of maintenance personnel on Limitorque actuators and use of MOVATS MOV diagnostics appeared insufficient, in that training in the combination was limited to a total of 2 days every 2 to 3 years. In addition, no diagnostic training was required for the MOV Engineer, although he may perform the diagnostic testing and is responsible to interpret results.

The inspectors reviewed the latest revisions of the Training Department Procedures (TDPs) TDP-306, Nuclear Electrician Training Program; TDP-308, Engineer Training Program; and, TDP-309, Nuclear Mechanic Training Program. These procedures address the refresher training requirements for the MOV program. The procedure review indicated that the electrical personnel have overall mechanical and electrical maintenance responsibilities for MOV actuators. Refresher training for these personnel has been upgraded to include 3 days annual special requalification MOV training. The training personnel indicated that, in addition to this requalification training, it has been the practice to conduct refresher training in MOVATS diagnostic techniques and Limitorque valves just prior to conducting outage MOV work activities. The inspectors verified that the engineers in the MOV group had satisfactorily completed specialized MOVATS training consisting of "Advanced Signature Analysis" and "3000 Data Acquisition Instruction" during 1992. The inspectors considered this level of training to be adequate.

Concern 3 (NWRR)

This concern was discussed in Section 3.e of the Phase I MOV report. No provisions had been made for periodic tests or inspections of MOV thermal overload protection devices to verify their continued capabilities. No justification was provided for the omission. The generic letter did not request tests or inspections of thermal overloads.

The licensee stated that the testing of thermal overloads was not required. However, the decision for testing thermal overloads is still under consideration. The licensee has a preventative maintenance procedure (PM-122) for testing the thermal overloads.

Concern 4 (NWRR)

This concern was discussed in Section 3.j of the Phase I MOV report. ITI MOVATS was not on the licensee's approved vendor list for safety related equipment even though it provided information used for calculations on safety related MOVs.

The inspectors verified that ITI MOVATS was on the approved vendors list for safety related equipment.

Concern 5 (NWRR)

This concern was discussed in Section 3.h of the Phase I MOV report. Important sections of the licensee's GL 89-10 Program Manual and a number of important program procedures were under revision or were to be revised in the near future.

The inspectors verified that the MOV program manual was revised to Revision 7, dated April 27, 1992. In addition maintenance procedure MP-402E, Use And Operation Of The Motor Operated Valve Analysis Test System (MOVATS), was also revised to Revision 7 dated April 27, 1992. New procedure PT-428 MOV-260 MOVATS D/P Testing, Revision 0, was approved April 9, 1992.

Concern 6 (NWRR)

This concern was discussed in Section 3.f of the Phase I MOV report. MOV failure analysis and trending were not incorporated into the GL 89-10 program. However, the licensee had identified equipment failure analysis and trending as an area for improvement and had taken actions to improve performance in this area.

The inspectors verified that MOV failures and corrective actions are documented in accordance with the plant Problem Report process. Compliance Procedure CP-111, Documenting, Reporting, and Reviewing Problem Reports, section 3.2.10 requires that Problem Report data be input into the Noncompliance Tracking and Trending System (NTTS) for trending. Based on the licensee's updated response to GL 89-10, this data will be used to establish a MOV tracking and trending program within two years after MOV Program implementation as suggested in the GL. FPC plans to complete implementation of the MOV Program by the end of Refuel 9 currently scheduled for April 1994.

Concern 7 (NWRR)

This concern was discussed in Section 3.e of the Phase I MOV report. The licensee indicated that periodic static testing will be used to verify continued capability of MOVs to operate under worst case differential pressure and flow conditions. This is not currently considered adequate because of the uncertain relationship between performance of a MOV under static conditions and design-basis conditions.

See paragraph 2.a Concern 2 (WRR) of this report.

The inspectors verified that any design change or modification concerning a MOV will require the MOV to be tested under initial conditions as required in the MOV program and Nuclear Engineering Department procedure NED 235, Design Consideration For MOVs, Revision 2, dated December 31, 1992.

Concern 8 (NWRR)

This concern was discussed in Section 3.c of the Phase I MOV report. The adequacy of engineering studies which may be used as a basis for increasing the rating of Limitorque actuators and their application will require further NRC assessment. NRC review of this matter and industry developments are in progress. RII will evaluate the licensee's use of such studies in its subsequent inspection of GL 89-10 program implementation.

The issue is still being reviewed by the NRC staff and it will be addressed during the Phase II inspections.

3. Action On Previous Inspection Findings (92702)

(Closed) IFI 89-28-02, "Possible Exposure of d-c Motors to Switching Surges." In a previous inspection, a NRC inspector, while reviewing an elementary diagram for a d-c powered motor operated valve, identified that the motor's shunt field may be vulnerable to switching surges because a path for the field discharge current had not been provided.

This item was initially reviewed during a NRC inspection conducted during October 15-18, 1991, and discussed in report 50-302/91-21. This inspector had reviewed a completed modification package for installing the field discharge resistors and concluded that the package itself was adequate. This inspector was informed by the licensee that the modification would be implemented during the next refueling outage.

During this inspection, the inspectors reviewed modification package MAR 90-08 20-01, DC MOV Surge Suppression Device, dated March 15, 1991 and determined it was satisfactory. The inspectors conducted walk down inspections of MOVs ASV-5, ASV-204, EFV-11, EFV-14, EFV-32, EFV-33, FWV-33, FWV-34, FWV-35, FWV-36, MSV-55, and MSV-56 to verify that the shunt field discharge resistors were installed in the twelve d-c powered MOVs.

4. Exit Interview

The inspection scope and results were summarized on January 8, 1993, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

The licensee was informed that IFI 89-28-02 was closed out.

5. Acronyms and Initialisms

ENG	ENGINEERING
EPRI	ELECTRIC POWER RESEARCH INSTITUTE
FPC	FLORIDA POWER CORPORATION
GL	GENERIC LETTER
IFI	INSPECTION FOLLOWUP ITEM
IR	INSPECTION REPORT
MOV	MOTOR-OPERATED VALVE
MOVATS	MOTOR-OPERATED VALVE ANALYSIS AND TEST SYSTEM
NED	NUCLEAR ENGINEERING DEPARTMENT
NPSE	NUCLEAR PLANT SYSTEMS ENGINEERING
NRC	NUCLEAR REGULATORY COMMISSION
NSSS	NUCLEAR STEAM SYSTEM SUPPLIER
NTTS	NONCOMPLIANCE TRACKING AND TRENDING SYSTEM
NWRR	NO WRITTEN RESPONSE REQUIRED
RII	REGION II
TI	TEMPORARY INSTRUCTION
WRR	WRITTEN RESPONSE REQUIRED