



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

Report No.: 50-302/90-20

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: August 27-31, 1990

Inspector: N. Merriweather 9-26-90  
N. Merriweather Date Signed

Approved by: Thomas E. Conlon 9-26-90  
Thomas E. Conlon, Chief Date Signed  
Plant Systems Section  
Engineering Branch  
Division of Reactor Safety

SUMMARY

Scope:

This routine, announced inspection was conducted in the area of Environmental Qualification (EQ) of Electrical Equipment. The inspection included: a review of activities related to the EQ Enhancement Program; followup on previous enforcement issues; and followup on Licensee Event Report 89-16-05.

Results:

The EQ Enhancement Program is on schedule and should be completed by the end of the calendar year. The voluntary expansion of the EQ Enhancement Program by the licensee to include a redefinition of radiation harsh environments outside containment will require additional walkdowns with new items being added to the EQ Master List (EQML). This action is scheduled to be completed before the end of the next refueling outage. The licensee's corrective action on previously identified violations is complete and the licensee is in full compliance on those specific issues. New EQ issues have been identified by the licensee as they continue with the EQ Enhancement Program and are being reported in supplements to LER 89-16. The current revision of this LER is supplement No. 5. Within the areas examined, one minor weakness was identified in the EQ training program and one unresolved item (302/90-28-01) regarding the EQ requirements for boron precipitation control was also identified. The licensee acknowledged the concern on EQ training and indicated that it would be reviewed

as an internal followup item by FPC. Regarding the unresolved item, the licensee's position was that CR3 had been analyzed without the need for alternate flow paths to limit boron concentration (see BAW Topical Report 10103A, Revision 3). However, letters from FPC to NRC dated in 1975 and 1976 and Supplement 3 to the SER dated December 30, 1976, do not support the staff's acceptance of this position. In fact, the licensee is required by the staff to provide a description of the procedures and a single failure analysis of the components required for post LOCA boron precipitation control. The operating modes would require certain valves inside containment to be environmentally qualified. The particular valves of concern are discussed in a letter from FPC to NRC dated January 13, 1976. The licensee has indicated that they would either re-evaluate the need for boron precipitation control or upgrade the components located in a harsh environment to meet EQ requirements.

#### Unresolved Item

The licensee has indicated that they would either re-evaluate the need for boron precipitation control or upgrade the components located in a harsh environment to meet EQ requirements. (paragraph 2.f)

#### Weakness

Training for Nuclear Operations Staff, in particular the Maintenance staff, is limited to a brief discussion of EQ during GET. This may not be adequate in the future as changes occur in the Maintenance and Planning staff. Most if not all current staff members received the EQ Awareness Training in 1989, which was a one time training class on EQ. This training has been video taped and is required training for new employees in Engineering; however, no provisions have been made for Nuclear Operations staff. (paragraph 2.g)

#### Strengths

The reformatted EQ Vendor Qualification Packages (VQPs) will be more user friendly.

The EQ Master List will become part of the Configuration Management Information System.

EQ Shutdown Logic Diagrams, System Functional Diagrams, and installation details will be added to the drawing control system.

The licensee has implemented a temperature monitoring program.

The licensee has established a dedicated on-site EQ Group under the responsibility of the Director Nuclear Operations Engineering and Projects.

The licensee has developed an EQ maintenance manual which combines all the EQ maintenance instructions into one document.

The above unresolved item, strengths, and weakness are discussed further in the report details.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*G. Boldt, Vice President Nuclear Production
- \*J. E. Colby, Acting Manager, Site Nuclear Engineering Services
- \*P. Ezell, Nuclear Operations Planning Supervisor
- \*R. E. Fuller, Senior Nuclear Licensing Engineer
- \*A. G. Gelston, Supervisor, Site Nuclear Engineering
- \*B. Hickie, Manager, Nuclear Plant Operations
- \*E. E. Renfro, Director, Nuclear Operations Materials and Controls
- \*D. A. Shook, Manager Electrical/I&C Engineering
- \*M. S. Williams, Nuclear Regulatory Specialist

#### Impell Corporation

M. Thomas, Lead Senior Engineer

#### NRC Resident Inspectors

- \*W. H. Bradford, Resident Inspector
- \*P. Holmes-Ray, Senior Resident Inspector

\*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

### 2. Followup on Licensee's Implementation of the EQ Enhancement Program

#### Background

In letters to NRC, dated October 17 and 23, 1989, and May 18, 1990, FPC provided information on the EQ Enhancement Program being implemented at CR3. This program was being implemented as part of the corrective action to prevent recurrence of EQ violations as those proposed in NRC Notice of Violation and Proposed Imposition of Civil Penalty dated September 13, 1989. The licensee identified several key areas that the EQ Enhancement Program would address. These areas were examined during the inspection and are discussed in the paragraphs that follow.

#### Inspection Details

The inspector held discussions with the licensee on the overall status of the EQ Enhancement Program completion schedule. Based on these discussions and a review of field verification data, training records, procedures, various EQ drawings, calculations, and etc., the inspector

confirmed that the licensee is meeting their commitments to NRC regarding the EQ Enhancement Program scope and completion schedule. During this inspection the licensee's activities related to key EQ Enhancement Program functional areas were reviewed and found acceptable. The areas examined and a brief discussion of the inspection findings are described as follows:

a. Organization/Staffing

The licensee has established an on-site EQ engineering group which now provides a single point of accountability within Nuclear Operations. The overall implementation and administration of the Environmental Qualification Program is the responsibility of the Director, Nuclear Operations Engineering and Projects. This is described in Nuclear Operations Procedure NOD-39, Revision 0, Environmental Qualification Program. The procedure requires that the Manager, Site Nuclear Engineering Services (SNES) establish a dedicated staff to maintain the EQ program and assign a Nuclear Engineering Supervisor to be responsible for maintaining the EQ program. A staffing plan provided to the inspector shows the on-site EQ group consisting of a Supervisor, two Senior Nuclear I&C Engineers and one EQ Specialist.

b. Procedures

As discussed above the responsibilities for the on-site EQ group are described in NOD-39. In addition, other engineering and plant procedures have been revised to address implementation of the EQ program. Based on discussions with the licensee and a summary of the procedures revised the inspector considered activities in this area to be acceptable.

c. Environmental Parameters

The licensee indicated that several of the Environmental Zone Data Sheets have been revised. Some of the revisions resulted from recalculation of the Reactor Building Temperature Profiles (e.g., zones 38, 66, 39, and 72), a plant specific Beta dose calculation, developing a MSLB temperature and pressure profile for CR3 containment, and evaluating MSLB calculations outside containment. The inspector reviewed data associated with both a temperature study of areas inside containment and the plant specific Beta dose calculation. The information developed from these documents has been used appropriately in revising Environmental Zone Data Sheets.

d. Field Verification

The licensee performed walkdowns of EQ end devices to base-line the as-built status of the EQ equipment. The walkdowns were performed using detail walkdown packages which included a loop drawing of all components in the circuit. The licensee indicated that all walkdowns

considered part of the original EQ Enhancement Program have been completed. Additional walkdowns are planned to address the redefinition of radiation harsh environments outside containment. These walkdowns are scheduled to be completed before the end of the next refueling outage.

e. Documentation

New vendor qualification packages were developed to support plant restart from the last refueling outage. These new packages were developed to address those EQ items that were not previously addressed by the EQ program and were discovered during the EQ walkdowns. New reformatted VQPs will replace the old qualification documents and will be more easily understood for use by all organizations. The new VQPs are scheduled to be completed and issued by November 1990. In addition to issuing new VQPs the licensee plans to issue installation drawings and a EQ Maintenance manual.

f. EQ Master List

The licensee had a contractor independently develop an EQ Master List using Shutdown Logic Diagrams (SLD) prepared for each design basis event postulated in accordance with 10 CFR 50.49. SLDs identify the systems needed to fulfill the safety functions. Safety Function Diagrams were developed to evaluate the components of the systems needed. From all this data a new EQ Master list was developed and is currently in draft form as Preliminary "Rev C." The old EQ Master list used at the site was cross checked against "Rev C" to assure that all EQ end devices were included. In addition, the new list will be incorporated into the Configuration Management Information System (CMIS). The SLDs and SFDs will be maintained as controlled drawings.

During the redevelopment of the EQ Master list, the licensee identified several components that had not been included in the EQ program. These components were identified in Nonconforming Operating Report (NCOR) No. 90-84. Subsequently, the licensee reported these additional items to NRC in a supplement to LER 89-16. The problem with this report is that the components identified were not consistent in all cases to the NCOR. In particular, decay heat valves DHV3 and DHV4 were specifically identified on the NCOR. However, the LER identified the limit switches only as needing Qualification. The LER also indicated that the valves could be manually opened post LOCA, however, these valves are located inside containment. Further review of this matter revealed that the licensee was required by NRC to have procedures for boron precipitation control. These procedures required the use of valves DHV3 and DHV4 post LOCA which would mean that these valves are required to be environmentally qualified. A discussion of the procedures and the required flow paths are described in letters from FPC to NRC dated 1975 and 1976. In addition, the staff review of

these procedures is discussed in Supplement 3 of the Safety Evaluation Report dated December 30, 1976.

The position taken by the licensee is that these valves are not required to mitigate the consequences of a LOCA since CR3 had been previously analyzed without the need for alternate flow paths to limit boron concentration (see BAW Topical Report 10103A, Revision 3). Therefore, the licensee did not classify these valves as safety-related. Although important to manage an accident, these valves are not required. The inspector did not agree with the licensee on this issue because information contained in letters to NRC dated 1975 and 1976 and Supplement 3 to the SER dated December 30, 1976, clearly indicated that the staff required the licensee to have procedures for boron precipitation control. This issue was identified to the licensee as Unresolved Item 50-302/90-28-01. The inspector has requested further information from the licensee to determine the EQ qualification basis for this equipment. The licensee has indicated that they would either re-evaluate the need for boron precipitation control or fully qualify the components to meet EQ requirements.

g. EQ Training

The licensee completed EQ Awareness Training in August 1989. This was a one time training course given to approximately 245 people in Nuclear Operations. This included all technical people in Nuclear Engineering responsible for plant design and modifications. In addition to the above, the licensee has revised Nuclear Engineering procedures requiring supervisors to assure that new employees are trained on EQ. This training may be in the form of reviewing video tapes. However, EQ training for Nuclear Plant Operations staff has been limited to the Awareness Training given in August 1989 and GET. The GET training is very brief on the issue of EQ and may not be adequate in time as changes occur in plant staff. This was considered a weakness in the licensee's EQ Training Program. The licensee acknowledged the concern and stated that it would be reviewed as an internal followup item. The inspector found this to be acceptable since current employees have received the EQ Awareness Training.

3. Action on Previous Inspection Findings (92701) (92702)

The NRC Notice of Violation and Proposed Imposition of Civil Penalty dated September 13, 1989, identified two alleged violations with multiple examples. The violations were considered the result of the licensee's failure to implement adequate management and program controls to assure that equipment important to safety was properly environmentally classified and qualified and to verify that equipment was properly installed in the field. The violations were identified in NRC Inspection Report 89-09 and were given tracking numbers 89-09-01 through 8, 89-09-10 and 11. The licensee assigned tracking numbers 89-09-01 through 8, 89-09-10 and

89-09-11 (a), (b) and (c). During this inspection, the inspector examined appropriate objective evidence for each violation (i.e., completed Work Requests, MARs, procedures, EQ field verification data, training records, and etc.) to confirm completion of the corrective actions as stated in the licensee's response to the Notice. (For a description of the corrective action taken for each individual violation, see FPC letter to NRC dated October 17, 1989). The NRC is currently evaluating FPC request for significant mitigation of the civil penalty. Notwithstanding the above, the corrective actions taken to resolve each violation have been reviewed and are considered adequate. The results of this inspection concluded that the licensee is in full compliance on these matters. Therefore, the above NRC violations are now considered closed.

The licensee reported the above violations to NRC in LER 89-16, which was later supplemented (Currently at Revision 5) to include additional EQ items that were discovered during the EQ Enhancement Program. This review examined the corrective actions taken on a sample of those new items. One area examined in particular were those items identified that had been omitted from the EQ Program. Most of these items related to the post LOCA boron precipitation control procedures and are discussed earlier in the report. LER 89-16-05 is considered closed, however, the licensee indicated that the LER may be supplemented once more to address EQ concerns related to the Hydrogen Recombiner and Containment Purge and Venting System.

#### 4. Exit Interview

The inspection scope and results were summarized on August 27, 1990, with those persons indicated in paragraph 1. The inspector(s) described the areas inspected and discussed in detail the inspection results listed below. Although reviewed during this inspection, proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

(Closed) Violations 89-09-01 through 8, 89-09-10 and 89-09-11(a), (b) and (c).

(Open) Unresolved Item 90-28-01, Licensee will provide basis for not environmentally qualifying valves needed for boron precipitation control or will upgrade the components to meet full 50.49 EQ requirements.

#### 5. Acronyms and Initialisms

|      |                             |
|------|-----------------------------|
| BAW  | Babcock and Wilcox          |
| CR3  | Crystal River Unit 3        |
| DHV  | Decay Heat Valve            |
| EQ   | Environmental Qualification |
| EQML | EQ Master List              |
| FPC  | Florida Power Corporation   |
| GET  | General Employee Training   |
| I&C  | Instrumentation and Control |

LER Licensee Event Report  
LOCA Loss of Coolant Accident  
MSLB Main Steam Line Break  
NCOR Nonconforming Operations Report  
NRC Nuclear Regulatory Commission  
SER Safety Evaluation Report  
SFD System Functional Diagram  
SLD Shutdown Logic Diagram  
VQP Vendor Qualification Package