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

Report No.: 50-302/92-19

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

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

Facility Name: Crysta. River 3

Inspection Conducted: July 13-17, 1992

Inspector: McKenzie Thomas 8-21-92
M. Thomas Date Signed

M D Hunt 8/24/92
M. Hunt Date Signed

L. King 8/24/92
L. King Date Signed

Accompanying Personnel: C. Rapp, Reactor Engineer
M. Mizuno, Japan Ministry of International Trade and Industry, (International Atomic Energy Agency Assignee)

Approved by: McKenzie Thomas 8/24/92
for F. Jape, Chief Date Signed
Test Programs Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of design changes and modifications and engineering technical support activities.

Results:

In the areas inspected, violations or deviations were not identified. The modifications reviewed were well planned and executed. The 50.59 safety evaluations and post modification tests were adequate. The licensee's process for prioritizing and scheduling modification activities was a positive example of

management involvement in ensuring that issues important to safety were properly prioritized, scheduled, and implemented. Resolutions to problem reports were generally completed within the required due date. However, the problem reports reviewed lacked event details, safety consequences, and root cause. Also problem report reportability and safety significance determinations were not clear. An inspector followup item was identified to review the licensee's resolution of problem reports POPR-90-0058 and CMPR-91-0008.

Engineering was adequately staffed with knowledgeable and experienced engineers. Training provided to the engineering staff was adequate.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

K. Baker, Manager, Nuclear Configuration Management
*J. Baumgardner, Senior Nuclear Quality Auditor
C. Dutcher, Superintendent, Nuclear Projects
*A. Friend, Nuclear Principal Licensing Engineer
E. Froats, Manager, Nuclear Compliance
*A. Gelston, Manager, Site Nuclear Engineering Services
*G. Halnon, Manager, Nuclear Plant Systems Engineering
*J. Maseda, Manager, Nuclear Operations Engineering
*P. McKee, Director, Nuclear Plant Operations
*R. McLaughlin, Nuclear Regulatory Specialist
*D. Saiute, Nuclear Regulatory Specialist
P. Skramstad, Administrator, Master Schedule
*P. Tanguay, Director, Nuclear Operations Engineering and Projects
*J. Tunstill, Senior Nuclear Licensing Engineer
*R. Widell, Director, Nuclear Operations Site Support
K. Wilson, Manager, Nuclear Licensing

Other licensee employees contacted during this inspection included craftsmen, engineers, operators, security force members, technicians, and administrative personnel.

NRC Personnel

*P. Holmes-Ray, Senior Resident Inspector
R. Freudenberger, Resident Inspector
H. Berkow, Director, Project Directorate II-2, NRR
H. Silver, Senior Licensing Project Manager, NRR

2. Design Changes and Plant Modifications (37700)

a. Plant Modifications to Improve Reactor Safety

The inspectors reviewed the licensee's initiatives to identify and implement plant modifications to improve reactor safety. Documentation reviewed included revision 3 of the Master Schedule. Revision 3 covered fuel cycles 9 through 11 which included three mid-cycle maintenance outages and three refueling outages. Other documentation reviewed included Guideline 0-1, Master Scheduling Process, and Guideline 0-2, Request for Project Approval.

The primary purpose of the Master Schedule was to provide a means of defining and controlling major work for both operating and outage periods. The scope of the Master Schedule includes all major modifications

(greater than $50,000), significant corrective or preventive maintenance, inspections, and tests. The Master Schedule also controls the scheduling of regulatory requirements.

A master scheduling administrator, who reports to the Vice President Nuclear Production, coordinates and manages the master scheduling activities. The master scheduling administrator also coordinates the activities of Master Scheduling Group (MSG) which includes representatives from engineering, nuclear materials, site support, nuclear maintenance, and nuclear plant operations. The MSG is responsible for review and approval of all proposed projects and project scoring prior to final approval by the Vice President Nuclear Production. The MSG reviews the scoring of each project in the areas of (1) public safety, (2) personnel safety, (3) capacity factor, and (4) direct economic incentive. Each proposed project is scored against each attribute which is assigned an appropriate relative weight. The items are prioritized based on the total project score. Licensee personnel stated that approximately 80-90 percent of the requests for project approval were initiated by engineering and the remainder were initiated by operations.

The inspectors reviewed the listed documentation and concluded that licensee management had demonstrated the use of a prioritization process for identifying and implementing plant modifications. The licensee's prioritization process was a positive example of management involvement in ensuring that issues important to safety were properly prioritized, scheduled, and implemented.

b. Planning, Development and Implementation of Plant Modifications (37700)

The inspectors reviewed the MARs listed below to determine the adequacy of evaluations to meet 10 CFR 50.59 requirements; verify that the MARs were reviewed and approved in accordance with TS and applicable administrative controls; ensure that the subject modifications were installed (for those physically inspectable) in accordance with the MAR packages; applicable plant documents (drawings, plant procedures, Final Safety Analysis Report, TS, etc.) were revised to reflect the subject modifications; the modifications were reviewed and incorporated into operations training programs as applicable; and post modification test requirements were specified and adequate testing performed.

- MAR 90-02-14-01, Emergency Diesel Generator 3A/3B Control Logic

  This modification was implemented to change the control logic of diesel generator (D/G) standby circulating pumps 3A and 3B to provide an automatic stop on low lube oil temperature. The MAR stated that circulating low temperature lube oil could fill the engine upper crankcase with oil which could drain into the combustion area and could lead to hydrostatic lock. No deficiencies were identified with the 50.59 safety evaluation or design inputs.

- MAR 91-12-04-01, Main Feedwater (FW) Valve Isolation Timing Sequence Change

  This MAR changed the timing sequence of the MFW isolation test matrices 1 and 2 of steam generators A and B. The changes consisted of a four second closing with a two second delay before reopening. The MFW isolation valves were being tested in such a way that it caused wear on valve components and internal motor heating. The existing test circuit caused each valve to immediately reverse direction against the inertia built up during the partial closing. The two second time delay was placed between the closing and opening signals to allow the inertia to diminish.

- MAR 92-04-02-01, Replace Emergency Feedwater Valves EFV-11, -14 and Revise Gear Ratio Operator

  The replacement of these valves was scheduled for and accomplished during the recently completed outage. The MAR was reviewed for proper identification of changes required, execution of the plan, and PMT. All references were included in the MAR. The MAR contained instructions for the addition of a torque-thrust cell if received in time for installation. All calculations were referenced, new parts identified, drawings identified, and installation instructions and PMT requirements listed. All proper reviews were completed.

- MAR 92-04-02-02, EFV-11, -14, -32, -33 Cable Replacement

  This section covered the installation of larger electrical cables to reduce the DC voltage drop, removal of the thermal overloads to reduce voltage drop concerns during a HELB, and changed the control logic to close the valve on a limit rather than torque switch.

- MAR 92-04-02-03, Upgrade ASV-5 & 204,

  This modification changed the actuator gearing and spring pack in these MOVs.

- MAR 92-04-02-04, Upgrade EFV-32 & EFV-33

  The valve stems were changed to allow for sufficient thrust for closing, added a larger motor to the actuator and bypassed the close torque switch for 98% of the closing travel.

- MAR 92-01-23-01, Plant Relay & Breaker Setting Corrections

  Various miscellaneous 4.16 KV & 6.9 KV relays did not meet industry standards when compared to new protection relay calculations.

  The correction of these relay settings was to increase plant reliability through proper relay coordination. This MAR was reviewed to verify proper reviews had been conducted from the engineering effort through the completion of the modification. A 10 CFR 50.59 review was completed. This MAR was closed conditionally on verification/review of the relay calibration data sheets which had not yet been added to the MAR package.

- MAR 89-11-13-01, Upgrade ASCO Solenoid Valves

  This modification replaced the existing commercial grade AC solenoid valves with ASCO nuclear grade solenoid valves to improve valve reliability. The licensee considered this MAR to be an enhancement because these valves were not included in the EQ program.

- TMAR 92-03-07 01, Delete Trip Control Breakers

  The dedicated offsite power 230-4.16 KV transformer controls were changed by this temporary modification to remove the tripping function for breakers 4900 & 4902 from the main control board. This modification was implemented by the Relay Department. A regulatory/environmental review, HELB review, fire protection review, SBO review and safety review were performed.

- MAR-87-02-30-09, Rework Power Supplies for MFWP Auxiliary Oil Pumps FWP 4A and 4B

  This MAR involved changing the power supplies to the

main and auxiliary oil pump for the main feedwater pumps so that the loss of a single MCC would not cause the loss of both the main and auxiliary oil pumps for a MFWP. The modification was instituted to improve system reliability.

The item was a recommendation from the B&W Owners Group, SPIP. SPIP recommendations are related to trip Reduction and Transient Response Improvement.

The following NEPs control the development of modification documents and were reviewed by the inspectors:

(NEP) 210, Minor Modifications

NEP 211, Modification & Approval Records.

NEP 251,Preparation, Review, and Approval of Field Change Notices.

Violations or deviations were not identified in the areas inspected.

3. Engineering and Technical Support

The inspectors reviewed organization and staffing and the activities of various plant engineering groups to assess the engineering support provided to plant operations and maintenance staffs. The inspectors concluded effective engineering support was being generally provided. However, there were examples of identified problems with safety systems not being resolved in a timely manner. Examples are discussed in the following paragraphs.

a. Organization and Staffing

Engineering and Technical Support was provided by both on-site and corporate organizations. On-site technical support was provided mainly by Nuclear Plant Systems Engineering. This support included equipment performance trending, repetitive and impeding failure programs, systems engineers, and maintenance engineers. Responsibilities for each engineering organization was described in NEP-102, Organization of Nuclear Engineering and Projects, Revision 6.

The Nuclear Plant Systems Engineering group was adequately staffed with knowledgeable engineers. The training program was described in procedure TDP-308, Engineering Training Program, Revision 8. Systems engineers received ten weeks of plant systems training including two weeks of simulator training. The plant

systems training covered the same material used in licensed operator training, but not in as much detail. The simulator training covered normal and transient plant operations. Both written and walkthrough examinations are conducted after completion of the plant systems training. The systems engineers also attended a continual engineer refresher training and requalification program. Vendor training routinely was included for both the responsible and the backup system engineers. Attending owners group meetings was considered part of engineer training. However, the training did not include the use or development of PRAs. Engineers interviewed received copies of the PRAs for their systems and had commented on them. However, the PRAs had not been approved to the level where they were being used.

b. Problem Reports

The inspectors reviewed PRs SSPR-91-0018, SYPR-91-0025, SYPR-92-0007, CMPR-91-0008, SYPR-91-0019, and POPR-90-0058. The inspectors requested PR SYPR-91-0020, but the licensee could not find the PR in the plant records system. Also, the licensee could not locate supporting documentation for other PRs in the plant records system. The licensee stated these records were in the process of being turned over from Quality Programs and some records were unavailable on-site. The inspectors found the PRs lacked details describing the event, root cause analysis, and safety consequences. The inspectors discussed PRs SSPR-91-0018, CMPR-91-0008, SYPR-90-0018, and POPR-90-0058 with the responsible engineers. The inspectors found the responsible engineers had more detailed and complete information than was available in plant records. The engineers were actively involved with resolving the particular PR and maintained increased attention to safety significant problems. The inspectors also found two safety significant PRs (CMPR-91-0008, and POPR-90-0058) that were not resolved in a timely manner. Details of these two PRs are given in the following paragraphs.

- CMPR-91-0008, FWV-31 and FWV-32 Closure Times

CMPR-91-0008, issued April 4, 1991, identified excessive stroke times of 66 seconds for FWV-31 and FWV-32. The UFSAR main steam line break analysis clearly assumes main feedwater isolation within 34 seconds. If a single failure is assumed which prevents either main feedwater pump suction isolation valve (FWV-14 and FWV-15) from closing in 34 seconds, then

all main feedwater pump discharge isolation valves must close in 34 seconds. FWV-31 and FWV-32 are two of these valves. Redundancy of main feedwater isolation is implied by the design of the EFIC system. The inability of FWV-31 and FWV-32 to close in 34 seconds leaves the plant in an unanalyzed condition with the potential for operating outside the design basis. The licensee evaluated the PR on April 11, 1991 and determined the issue would remain classified as significant, but operation in this unanalyzed condition was deemed to not significantly compromise plant safety. The licensee's justification for the issue not compromising plant safety was based on the following:

1) The low-load control valves (FWV-37 and FWV-38) are installed in series with FWV-31 and FWV-32 and receive a close signal from the Integrated Control System in the event of a MSLB.

2) The main feedwater pumps trip on low steam generator pressure resulting from the MSLB.

3) The AE determined that 50,000 to 75,000 pounds-mass of steam beyond the amount assumed in the current UFSAR MSLB analysis would need to be released before exceeding containment design pressure. This was considered to be a considerable amount based on the fact FWV-31 and FWV-32 would be approximately halfway closed in 34 seconds.

4) The magnitude of core overcooling and potential challenge to Departure from Nucleate Boiling Ratio limits due to a MSLB at present would be much less than analyzed in the UFSAR.

During this inspection, NRC regional management reviewed the licensee's evaluation and concluded the evaluation adequately addressed the question concerning potential impact on plant safety.

The analysis, being performed by B&W, was targeted for completion on May 4, 1991 to provide for final disposition and reclassification of the PR. The due date was extended by the licensee to July 3, 1991 in an IOC dated April 16, 1991. The licensee later extended the due date to December 31, 1992 in an IOC dated September 24, 1991. The inspectors considered the time being taken to resolve this PR excessive.

The inspectors expressed concern that this issue was not reported to the NRC. Licensee personnel stated the

reportability of this issue had not been determined because the analytical work was not complete. The licensee acknowledged that, due to the potential significance of this issue, the NRC should have been made aware of the issue and the ongoing efforts to resolve it. Licensee personnel further stated that, due to more recent NRC concerns over the timely reporting of significant issues, steps had been taken to ensure that problems are properly evaluated for timely reportability to the NRC.

- POPR-90-0058, BS valves unable to meet stroke time requirement

POPR-90-0058, issued November 30, 1990, identified RBS pump suction valves BSV-16 and BSV-17 stroke times were excessive. The excessive stroke times prevented the RBS system from meeting the 56 second TS ESF response time. This issue was originally identified in 1980 and resolved by opening BSV-16 and BSV-17 and removing power. However, because of ISLOCA concerns, one of the suction valves was closed with power available when initiating decay heat removal in Mode 4. Closing the suction valve made one train of RBS inoperable resulting in a voluntary entry into the LCO for RBS. The inspectors found a 50.59 safety review was conducted in 1980, but could not determine if a 50.59 safety review was done for POPR-90-0058.

In 1990, Operations determined voluntary entry into the RBS LCO was unacceptable and requested the RBS suction valves be modified to meet the RBS ESF response time or the Mode 4 requirement removed from TS. The licensee recently completed an analysis and found the Mode 4 requirement could not be removed from TS. The inspectors discussed this PR with the responsible engineer and were told a new analysis was being considered to increase the TS ESF response time to 120 seconds. The engineer was unsure when this study would be completed. Given the safety significance of this PR, the inspectors considered the time to resolve this PR excessive.

The inspectors reviewed the UFSAR description of the RBS system. The UFSAR described the RBS pump suction and discharge valves opening in response to a ESF actuation signal. The inspectors also reviewed the EDBD for the RBS system and found it described BSV-16 and BSV-17 as deenergized open. The licensee was aware of the difference between the UFSAR and EDBD for the RBS system. The RBS was being operated as described in the EDBD.

The inspectors informed the licensee the resolution of problem reports POPR-90-0058 and CMPR-91-0008 would be tracked as Inspector Followup Item 50-302/92-19-01. The resolutions will be reviewed during future NRC inspections.

c. Maintenance Engineering Support

Nuclear Plant System Engineering also provided six engineers to support maintenance. These engineers were located in the maintenance area to allow for more immediate support of maintenance activities. The engineers also had responsibility for component programs such as MOVs and OTSGs.

No problems were identified in this area.

d. Configuration Control

The licensee was in the process of implementing an equipment failure trending program. The program included NPRDS data entry and repeat failure analysis. Maintenance work orders were used to supply the data for trending. Repeat failures were identified from maintenance work orders that were for rework.

A quarterly CFAF is generated from NPRDS and provided to the system engineers for review. If action on identified excessive failures is required, an REA is generated. If no action is required, the item is dropped from the next quarterly report. There was no capability to trend or track failures across quarterly reporting periods.

The purpose of the repetitive failure trending program was to identify suspect components before excessive maintenance. The program can identify a particular subcomponent but could not identify the failed part within the subcomponent. Also, no trending or comparison to previous failure data was performed.

Violations or deviations were not identified in the areas inspected.

4. Exit Interview

The inspection scope and results were summarized on July 17, 1992, with those persons indicated in paragraph 1. The inspectors described the areas irspected and discussed in detail the inspection results listed below. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

Inspector Followup Item (IFI) 50-302/92-19-01, Licensee Resolution of Problem Reports POPR-90-0058 and CMPR-91-0008.

5. Acronyms and Initialisms

AE	Architect Engineer
B&W	Babcock and Wilcox
CFAR	Component Failure Analysis Report
EDBD	Enhanced Design Basis Document
EFIC	Emergency Feedwater Initiation Control
EQ	Equipment Qualification
ESF	Engineered Safety Features
FWP	Feedwater Pump
HELB	High Energy Line Break
IOC	Interoffice Correspondence
ISLOCA	Intersystem Loss of Coolant Accident
LCO	Limiting Condition of Operation
MCC	Motor Control Center
MFW	Main Feedwater
MFWP	Main Feedwater Pump
MOV	Motor Operated Valve
MSLB	Main Steam Line Break
NEP	Nuclear Engineering Procedure
NPRDS	Nuclear Plant Reliability Data System
OTSG	Once Through Steam Generator
PMT	Post Modification Test
PR	Problem Report
PRA	Probabilistic Risk Analysis
RBS	Reactor Building Spray
REA	Request for Engineering Assistance
SBO	Station Blackout
SPIP	Safety and Performance Improvement Program
TMAR	Temporary Modification Approval Record
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report