Florida Power
CORPORATION

Crystal River Unit 3
Docket No. 50-302

October 11, 1993
3F1093-02

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Subject: Notice of Violation
NRC Inspection Report No. 50-302/93-18

Dear Sir:

Florida Power Corporation (FPC) provides the attached as our response to the subject Notice of Violation. Also included is our reply to the inspector followup items identified in this report.

Sincerely,

P. M. Beard, Jr.
Senior Vice President
Nuclear Operations

EEF:mag

Atts.

xc: Regional Administrator, Region II
NRR Project Manager
Senior Resident Inspector

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FLORIDA POWER CORPORATION
NRC INSPECTION REPORT 50-302/93-18
REPLY TO NOTICE OF VIOLATION

VIOLATION 50-302/93-18-01

10 CFR 50 Appendix B, Criterion III, requires design control measures which assure that regulatory requirements and design bases are properly translated into drawings, specifications, instructions, and procedures.

Contrary to the above, on July 15, 1993, the licensee's design control measures had not assured that design bases were properly translated into the minimum terminal voltage specified by battery service test surveillance procedure SP-523, Rev. 28. Design calculation E-90-0100, Rev. 2, dated June 12, 1993, determined that the minimum terminal voltage required of each safety-related battery was about 111 V. Surveillance procedure SP-523, Rev. 28, dated February 25, 1993, specified a lower minimum required battery terminal voltage of 105 V. There was no calculation to demonstrate, for the battery test load profile, that 105 V would be sufficient to assure operation of safety loads. The service test was required by Technical Specification 4.8.2.3.2.

ADMISSION OR DENIAL OF THE ALLEGED VIOLATION

Florida Power Corporation (FPC) accepts the Violation.

REASON FOR THE VIOLATION

The reason for the violation was an inadequate review of plant documentation when new calculation E-90-0099 Rev. 2 was issued. This review is required by FPC engineering procedures.

The terminal voltage of 105 V DC was used as the acceptance criteria of SP-523 (Station Battery Service Test) and is the correct number when testing the capacity of the battery as rated by the manufacturer. Calculation E-90-0099, Rev. 2 establishes the acceptance criteria to satisfy Technical Specifications. Calculation E-91-1004, Rev. 0 was used as the reference for SP-523. E-90-0099, Rev. 2 superseded E-91-1004, Rev. 0; however its impact on SP-523 was not evaluated.

CORRECTIVE ACTIONS TAKEN AND THE RESULTS ACHIEVED

During the performance of SP-523 in the Mid-cycle 9 outage, a conservative load profile was used that was approximately 2.5 times greater than required by the calculation. An analysis has been performed which demonstrates that, had the profile established by the calculation been used in the performance of SP-523, the minimum voltage measured would have been greater than the 111 volts required by the calculation.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

The next revision of SP-523 will include a new load profile and minimum voltage acceptance values based on calculation E-90-0099, Rev. 2. The individual responsible for the review of the calculation will be counselled.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The procedure revision will be completed by January 30, 1994.

VIOLATION 50-302/93-18-02

10 CFR 50, Appendix B, Criterion V, requires that drawings used for activities affecting quality provide criteria for determining that the activities are satisfactorily accomplished. Additionally, Criterion V requires the activities to be accomplished in accordance with the drawing criteria.

Contrary to the above, on June 30, 1993, activities affecting quality had not been satisfactorily accomplished in accordance with the criteria of the applicable drawings. Breakers and breaker settings and a thermal overload device in safety-related motor control centers (MCCs) were not in accordance with the drawings used for their verification. Examples were as follows:

In MCC 3A1, Cubicles 1BR, 7A, and 2C, the circuit breaker trip settings were in the "Hi" position instead of the "Lo" position specified by Drawing EC-206-054, Rev. 22.

In MCC 3A2, Cubicle 5AL, a 70 ampere circuit breaker was installed instead of the 80 ampere breaker specified by Drawing EC-206-055, Rev. 14.

In MCC 3AB, Cubicle 2D, the circuit breaker trip setting was set on the "2" position instead of the "Lo" position specified by Drawing EC-206-058, Rev. 12.

In MCC 3B2, Cubicle 6B, a N22 thermal overload was installed instead of the N23 type specified by Drawing EC-206-057, Rev. 11.

ADMISSION OR DENIAL OF THE ALLEGED VIOLATION

FPC accepts the Violation.

REASON FOR THE VIOLATION

In ES MCC 3A1, Cubicles 1BR, 7A, and 2C, the instantaneous settings were originally placed on the breakers during the construction of the plant. A review of the relevant historical work requests to determine when the settings were changed provided no information. Florida Power is not able to determine how the incorrect settings were placed on the breakers.

In ES MCC 3A2, Cubicle 5AL, the installed 70 ampere breaker is correct. The referenced drawing was erroneously changed to indicate an 80 ampere breaker during the Electrical Calculation Enhancement Program (ECEP). Initially, the loads used in the calculation required an 80 ampere breaker. This resulted in the generation of an Open Item Report (OIR). During resolution of the OIR, it was discovered that there was conservatism in the load. When the actual load was used, the 70 ampere breaker was determined to be correct. The OIR was closed out with a recommended corrective action to change the load on the drawing. This recommendation was misinterpreted when the drawing was changed; and instead, the drawing was changed to indicate the larger size breaker.

In ES MCC 3AB, Cubicle 2D, the instantaneous setting was originally placed on the breaker during the construction of the plant. A review of the relevant historical work requests to determine when the setting was changed provided no information. Florida Power is not able to determine how the incorrect setting was placed on the breaker.

In ES MCC 3B2, Cubicle 6B, FPC has been unable to reconcile the difference between the documentation and the installed equipment. As early as 1976, the documentation indicated an N23 overload was required. The discrepancy was noted during the ECEP and it was confirmed by calculation that the N22 overload that was installed was the correct size. The drawing error should have been corrected at that time; however, the need for corrective action was not noted on the calculation sheet. FPC has been unable to ascertain why the N22 overload was (correctly) installed in a location that should have had an N23 overload per the documentation applicable at the time.

The following responds to additional examples from page 17 of the Inspection Report which were not cited in the Notice of Violation:

In ES MCC 3A1, Cubicle 3DR, the cause for the discrepancy can not be determined. The breaker was installed in 1985. All of the documentation associated with the modification indicated the breaker should have been 30 amperes.

In ES MCC 3A1, Cubicle 9A, the instantaneous setting was originally placed on the breaker during the construction of the plant. A review of the relevant historical work requests to determine when the setting was changed provided no information. Florida Power is not able to determine how the incorrect setting was placed on the breaker.

In ES MCC 3B2, Cubicles 3D and 4C, the breaker setting of "F" in the plant was correct. The drawing was incorrect because of a personnel error.

CORRECTIVE ACTIONS TAKEN AND THE RESULTS ACHIEVED

Work requests have been written to have the correct settings placed on the breakers in MCC 3A1, Cubicles 1BR, 7A, 2C; MCC 3AB, Cubicle 2D; MCC 3A1, Cubicle 9A; and MCC 3B2, Cubicle 3D and 4C.

In ES MCC 3A2, Cubicle 5AL, the 70 ampere breaker installed in the field was determined to be correct. The drawing was changed during the EDSFI.

In ES MCC 3B2, Cubicle 6B, the overload installed in the field is correct. The drawing was changed during the EDSFI.

In ES MCC 3A1, Cubicle 3DR, a modification has been issued to replace the breaker.

The drawing with the incorrect overload setting was corrected during the EDSFI.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

The discrepancies are considered to be unrelated, isolated events and do not require further corrective actions.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The breaker instantaneous trip settings in ES MCC 3A1 and MCC 3B2 have all been corrected. Due to post maintenance testing requirements, the breaker in ES MCC 3AB can not be scheduled for completion until Refuel 9, currently planned for Spring 1994. It is anticipated the breaker in ES MCC 3A1 cubicle 3DR will be replaced before Refuel 9.

For all other discrepancies, full compliance has already been achieved.

ATTACHMENT 2

UNRESOLVED ITEM 50-302/93-18-03

Adequacy of Testing Used to demonstrate Devices Receive Sufficient Voltage

The licensee's calculations determined that the voltage to many 120 VAC and 125 VDC devices was below the minimum pick-up voltage requirement indicated by the device manufacturers. The licensee used limited testing to demonstrate pick-up below the design supplied voltages. It did not appear that factors such as population variability and aging were adequately addressed through the testing performed. Acceptable criteria for establishing device capabilities through testing will be internally evaluated by the NRC. Upon completion, the licensee's use of testing will be re-examined. (Sections 2.3.3 and 2.4.2)

FPC Response

Measured values are used to provide reasonable assurance that the relays will perform under degraded voltage conditions. The inspection report questions whether the limited testing adequately demonstrates that devices would continue to operate considering aging and other factors addressed by manufacturers' qualification test programs.

FPC is not aware that aging is a problem. The NEMA standards that relays are manufactured to do not require age testing to be performed. The only aging mechanism that the industry has any ability to predict is that associated with the chemical degradation of insulating materials. Until gross failure of the insulation occurs, its degradation does not impact the pick-up voltage of control devices (in mild environments). All of the relays in question are located in a mild environment.

Pick-up voltage is dependent on a limited number of factors, including coil resistance, spring force, gravity (in some cases), and lubrication. Coil resistance does not change. The spring force may tend to decrease with repeated cycling. This would tend to reduce the required pick-up voltage. No apparent lubricants are used on the relays in question. Frictional forces are small compared to spring and gravity forces.

In an effort to determine if aging were a problem, FPC contacted several manufacturers and asked them if aging would change the pick-up voltage of relays operating with the solenoid principle, which is the concern. We received the following comments:

- All their relays would be effected less than ±3%.
- The impact is less than 1%.
- The value is not a concern and is not measured.

FPC continues to believe that the tests performed were valid and representative of relays not tested. The differences between relays of the same model and the changes as a result of aging are insignificant when compared to the differences bet the actual pick-up voltages measured and the terminal voltages calculated. In tion, conservatism in the calculations is known to exist and provides furt. margin.

INSPECTOR FOLLOWUP ITEM 50-302/93-18-04

Increased Vulnerability Due to Delay in Replacement of Potentially Degraded Engineered Safeguards Transformer.

Two safety-related (engineered safeguards) and six nonsafety-related 4160-480 V ventilated dry type transformers are utilized by Crystal River 3. In the 1989/1990 time period three of the eight transformers failed, one safety-related and two nonsafety-related. In a failure analysis completed in 1990 the licensee attributed the failures to the age of the transformers (about 15 years in service) and determined that the five remaining transformers (also in service for 15 years) should be replaced. All but the safety-related transformer were subsequently replaced. Its replacement was incrementally delayed and, as of this inspection, was reportedly planned for spring 1994. The delay appears to have been primarily based on avoiding any extension of planned outages. (Section 3.6)

FPC Response

Engineered Safeguards transformer A (1000 KVA) failed August 28, 1989. It was replaced with a safety-related transformer which was already in the warehouse. At the same time, a replacement spare transformer was ordered. One safety- related replacement is maintained in the warehouse. There were no in-stock spares maintained for the non safety-related transformers.

The Heating Auxiliary transformer (1500 KVA) failed on May 31, 1990 and the Turbine Auxiliary transformer "A" (2000 KVA) failed three days later on June 3, 1990. The Heating Auxiliary transformer was not immediately replaced. The Turbine Auxiliary transformer "A" was replaced temporarily with the spare 1000 KVA safety-related transformer. (This is the replacement spare described in the previous paragraph.) Administrative controls were put in place to assure the transformer was not overloaded. A replacement transformer of the proper size was ordered and installed near the end of June 1990. A replacement for the Heating Auxiliary transformer and a spare non safety-related 2000 KVA transformer were ordered at the same time. A decision was made to routinely maintain a spare non-safety-related (2000 KVA) transformer in addition to the spare safety-related (1000 KVA) transformer.

A failure analysis conducted following these failures determined that the transformers were failing because they were reaching their expected end of life. This may have been accelerated somewhat by moisture intrusion.

Management approval to replace the remaining five transformers was obtained on September 7, 1990. Subsequent to that plans were put in place to replace the Turbine Auxiliary transformer "B" (2000 KVA), Reactor Auxiliary transformer "B"

(2000 KVA), and the Plant Auxiliary transformer (1000 KVA) in the Mid-cycle 8 outage (Fall 1991). It had been determined there was sufficient time to replace only three transformers without extending the mid-cycle outage. The Turbine Auxiliary "B" and Reactor Auxiliary "B" transformers were selected because of already planned outages on their respective buses. The Plant Auxiliary transformer was selected for replacement during this outage rather than the "B" ES transformer because there were no scheduled ES bus "B" activities during the Mid-cycle 8 outage, but there was a "B" ES bus outage scheduled for Refuel 8. During the review of the report for the original transformer failure, the Plant Review Committee reviewed and approved this schedule.

ES transformer "B" (1000 KVA) and Reactor Auxiliary transformer "A" (2000 KVA) were scheduled for replacement in Refuel 8 (Spring 1992). This schedule for all of these replacements was put in place in the Fall of 1990. The three transformers scheduled for replacement in the Fall 1991 outage were replaced as planned.

In early 1992, it was determined through the Electrical Calculation Enhancement Program (ECEP) that the slightly higher impedance of the replacement ES transformer would cause low voltage problems for approximately 50 end devices when fed from the startup transformer. Thus, installation of the new transformer without other compensatory measures would have put CR-3 in a condition outside the design basis. The ECEP also showed that the installation of the Back-up Engineered Safeguards Transformer (BEST) and the raising of the Second Level Undervoltage Relay (SLUR) setpoint would eliminate this problem. Based on this, it was decided not to install the "B" ES transformer in 1992. The Reactor Auxiliary transformer "A" was replaced in Fall 1992 as planned.

The BEST and "B" ES transformer were both initially scheduled for installation in Spring 1993 (Mid-cycle 9). The schedule for the BEST was very tight and it was not clear until about midway through the outage that the installation could be completed. Because of this uncertainty, the option to delay final installation of the BEST was kept open as long as possible. The Train "B" outage work was completed in the first half of the outage and installation of this transformer would have forced complete installation of the BEST. This necessitated deletion of the "B" ES transformer replacement from the outage scope.

FPC will replace the "B" ES transformer during the Refuel 9 outage.

INSPECTOR FOLLOWUP ITEM 302/93-18-05

Incorrect Values in Proposed New Technical Specifications.

The licensee's new proposed Technical Specifications were only examined relative to two requirements. In both cases errors were identified by the inspectors:

(a) Surveillance requirement 3.3.8.2 specified 0 V as the setpoint for the undervoltage relay. A higher value, such as the 2334 V currently prescribed in the licensee's relay setting procedure, should be specified. (Section 2.3.2)

(b) Surveillance requirement 3.8.6.1 specified a minimum electrolyte temperature of 60 degrees F for battery operability. The inspectors found that the battery sizing calculation had been based on a minimum electrolyte temperature of 70 degrees F for operability of the battery. (Section 2.4.3)

FPC Response

Both of the issues identified by the inspectors have been reviewed by engineering and licensing and discussed with NRC Technical Specification Branch (OTSB) representatives. FPC does not agree that the first item was in error. FPC has proposed the appropriate clarifications which have been preliminarily accepted by OTSB. In an effort to provide additional confidence in the engineering review of the new Technical Specifications (TS), engineering has reviewed all proposed sections of the new TS to ensure the appropriate disciplines have reviewed each. No additional sections were found to need an electrical review.

Furthermore, Florida Power does not agree with the inspection report conclusion that the issues identified in the new TS indicate inadequate engineering involvement in the development of the TS. Both on-site and off-site engineering organizations have been heavily involved in the review of the new Technical Specifications throughout their development including the latest phase of the conversion (from October 1992 to present). Their review is ongoing and will continue until the new TS are certified and submitted to the NRC for final approval and issuance.

FPC has high confidence that upon completion of the engineering review, as well as the reviews by other plant functional areas, the new CR-3 TS will accurately reflect the design and licensing basis of the unit and that no significant deviations from these bases will exist.

INSPECTOR FOLLOWUP ITEM 50-302/93-18-06

Review of Ampacity Analysis for Electric Penetration Conductors.

The licensee did not have an ampacity analysis for penetration conductors. This omission had already been identified by the licensee and several 480 V power circuit penetrations had been evaluated to demonstrate acceptable ampacity and short-circuit withstand capability. It is the inspectors' understanding that all penetration conductors will be analyzed. (Section 2.5)

FPC Response

This calculation is being done by Florida Power Corporation. A Problem Report was issued before the EDSFI and the corrective action is being implemented per that Problem Report. It is estimated the calculations will be completed by December 31, 1993.

INSPECTOR FOLLOWUP ITEM 50-302/93-18-07

Lack of Preventive Maintenance Inspection of Power Line Mechanical Connections to the Turbine Building.

The licensee had not scheduled or performed any preventive maintenance inspection of the 230/500 KV power line connections at the turbine building. The concern is that the mechanical integrity of the connections could degrade over an extended period of time and be lost during high winds or a seismic event.

FPC Response

A visual inspection was made from the ground during the week of September 20, 1993. This inspection used binoculars and found the hardware to be acceptable.
A close-up inspection will be done during the refueling scheduled in the Spring of 1994. The results of this inspection will be used to determine if routine periodic inspections should be required.

INSPECTOR FOLLOWUP ITEM 50-302/93-18-08

Lack of Preventive Maintenance Inspection of Motor Control Centers.

There was no scheduled periodic preventive maintenance inspection of the motor control center motor starters, cubicle stab connections, bus bars, and panel bottoms to identify any build up of dirt or dust or deterioration that might be a fire hazard or impair operation. (Section 3.4)

FPC Response

A modification is currently being developed to replace all of the Allen Bradley components in the safety-related MCCs. This is being done by pulling out the old buckets one at a time and replacing them with refurbished buckets. When the buckets are refurbished, an inspection will be done to make sure the stabs are good, as well as clean. This process will also include an inspection of the area where the stabs connect to the bus bars. It is anticipated that these activities will be worked on line with a completion date of approximately mid-1996.

The lower panels of the safety-related MCCs were removed and the exposed interior of the MCCs were cleaned during the inspection.