Florida Power
CORPORATION

June 8, 1984
3F0684-06

Mr. J.P. O'Reilly
Regional Administrator, Region II
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
101 Marietta Street, NW, Suite 2900
Atlanta, GA 30303

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
I.E. Bulletin 82-02

Dear Sir:

In response to Bulletin 82-02, Action Items 1, 2, and 4, Florida Power Corporation provides the attached response.

Florida Power Corporation regrets the delay in submitting the requested information for the above Action Items. The subject bulletin was overlooked in transition between tracking systems and organizational changes.

Sincerely,

G. R. Westafer

G.R. Westafer
Manager, Nuclear Operations
Licensing and Fuel Management

RHT:nrk

cc: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

IE 11

STATE OF FLORIDA,

COUNTY OF PINELLAS

G.R. Westafer states that he is the Manager, Nuclear Operations Licensing and Fuel Management for Florida Power Corporation; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the submitted information concerning I.E. Bulletin Number 82-02 Supplement, and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information, and belief.

G. R. Westafer

G.R. Westafer
Manager, Nuclear Operations Licensing and Fuel Management

Subscribed and sworn to before me, a Notary Public in and for the State and County above named, this 8th day of June, 1984.

Margaret A. Masters

Notary Public

Notary Public, State of Florida at Large,

My Commission Expires: May 29, 1988

IE BULLETIN NO. 82-02
FLORIDA POWER CORPORATION'S RESPONSE

ACTION ITEM 1

Where procedures do not exist, develop and implement maintenance procedures for threaded fastener practices. These procedures should include, but not limited to the following: (1) maintenance crew training of proper bolting/stud practices, tools application, specifications and requirements, (2) detensioning and retensioning practices (torque iteration), specified tolerances, and other controls for disassembly and reassembly of component closure/seal connections, (3) gasket installation and controls, and (4) retensioning methods and other measures to eliminate reactor coolant leakage during operations.

Quality assurance measures should also be established for proper selection, procurement, and application of fastener lubricants and injection sealant compounds to minimize fastener susceptibility to SCC environments.

RESPONSE 1

Maintenance crew training of proper bolting/stud practices, tools application, specifications and requirements is accomplished through classroom instruction and on the job training. Such training is documented on maintenance training records. Procedure criteria (2) through (4) (See Action Item 1 above) are included in individual maintenance procedures as required. Quality assurance measures for proper selection, and application of fastener lubricants are contained in individual maintenance procedures; procurement is controlled by the Nuclear Procurement and Storage Manual. Injection sealant compounds are controlled by procedures for Temporary Modification Approval Records which include review by Nuclear Engineering and Quality Programs.

ACTION ITEM 2

Threaded fasteners of closure connections, identified in the scope of this bulletin, when opened for component inspection or maintenance shall be removed*, cleaned, and inspected per IWA-2210 and IWA-2220 of ASME Code Section XI (1974 edition or later) before being reused.

*Fasteners "seized" or designed with interference fit, may be inspected in place.

RESPONSE 2

On August 2, 1982, Florida Power Corporation (FPC) by letter #3F-0882-04 identified threaded fasteners within the scope of this bulletin. With two (2) exceptions, those threaded fasteners were removed (fasteners "seized" or designed with interference fit were inspected in place), cleaned, and inspected per IWA-2210 and IWA-2220 of ASME Code Section XI (1974 edition). The two exceptions were:

1. Pressurizer Studs. These studs were not inspected and are scheduled for volumetric and magnetic particle examinations during Refuel VII.

2. CFV-1 and CFV-3. These studs were originally interpreted as reactor coolant pressure boundary (RCPB) retaining fasteners and identified as such in letter #3F-0882-04. After further review, FPC modified its interpretation to NOT consider the CFV-1 and CFV-3 studs as RCPB retaining fasteners.

ACTION ITEM 4a

A written report signed under oath or affirmation under provisions of Section 182a, Atomic Energy Act of 1954 as amended, shall be submitted to the Regional Administrator of the appropriate NRC Regional Office within 60 days following the completion of the outage during which Action Item 2 was performed. The report is to include:

a. A statement that Action Item 1 has been completed.

RESPONSE 4a

FPC has completed Action Item 1 (See Response 1).

ACTION ITEM 4b

b. Identification of the specific connections examined as required by Action Item 2.

RESPONSE 4b

The following threaded fasteners were examined (see also Response 2):

1. OTSG Studs (secondary side)
2. Reactor Coolant Pump Studs
3. CRDM Bolts
4. Reactor Vessel Studs

ACTION ITEM 4c

c. The results of the examinations performed on the threaded fasteners as required by Action Item 2. If no degradation was observed for a particular connection, a statement to that effect, identification of the connection and, whether the fasteners were examined in place or removed is all that is required. If degradation was observed, the report should provide detailed information.

RESPONSE 4c

1. Twenty (20) OTSG (secondary side) MK-162 Studs were removed and visually inspected with no visible signs of degradation. Studs # 1 and #11 were also volumetrically inspected with no recordable indications.

2. Sixteen (16) reactor coolant pump studs on reactor coolant pump 3-A-2 were volumetrically inspected in place with no recordable indications.

3. Eight (8) CRDM bolts were removed, cleaned, and PT examined. Six (6) showed no relevant indications; two (2) showed indications on the fourth thread from start.

4. Twenty (20) reactor vessel studs were removed and inspected by MT and UT with no recordable indications.

Staff time to perform the requested inspections and prepare the written response is shown below. The total radiation exposure attributed to the requested inspections is unavailable. However, the radiation exposure for all the work associated with the CRDM flanges during Refuel IV was 36.1 man-rem.

20 RCV bolts		88 hours
56 CRDM bolts	1 hour each to clean	56 hours
8 CRDM bolts	1 hour each to PT x 2 (2 PTs required)	16 hours
16 RCP bolts	1 hour each to clean	16 hours
16 RCP bolts	1 hour each to UT	16 hours
20 studs on OTSG	1 hour each to clean	20 hours
20 studs on OTSG	1 hour each to VT	20 hours
2 studs on OTSG	1 hour each to UT	2 hours
Administrative Time to Prepare Report		58 hours
	Total	292 hours

In letter #3F-0282-04, FPC additionally committed to submit details of the efforts of an Engineering Task Force assigned to review the problem of leakage around CRDM flanges. Details of this effort follows:

Refuel III (1981)

An inspection of the CRDM flanges revealed the following:

1. The flange at location P-6 showed definite signs of leakage, although the confirmed leak at P-6 was orders of magnitude less than any leakage identified during Refuel II (1980). In addition, two (2) bolts of this flange were loose (the two (2) bolts turned 1/6 of a revolution before reaching their assigned torque value of 225 ft-lbs).

2. Five (5) other flanges, B-6, B-10, F-14, G-7, and H-6, showed signs of very slight leakage.

3. Of the six flanges identified in (1) and (2) above, only B-10 and G-7 were not found to be leaking during Refuel II (1980).

4. The stators on most all CRDM's were stained and covered to some degree with boric acid crystals.

5. No physical damage to any of the bolts (including those at P-6) as a result of leakage was observed.

As a result of these discoveries, the following corrective action was taken:

1. The torque was checked on approximately 50 randomly selected bolts. None in addition to the two on P-6 were found to be loose.

2. The flange at location P-6 was repaired. The repair included the installation of new bolts (taken from spares) and a new gasket, and torquing them to a higher torque value (recommended by Babcock & Wilcox in a March 1981 service bulletin) of 290-300 ft-lbs.

3. An oversize gasket, 0.140" thick (design requirements are 0.125 + 0.010, -0.005") was installed in the outer ring of the B-6 flange.

4. The bolts at the other five flange locations, B-6, B-10, F-14, G-7, and H-6 were checked and retorqued to 290-300 ft. lbs.

A review of 1980 records revealed that at the six possibly leaking flanges, only B-6 had any physical damage to the flange face and gasket areas; the remaining five met inspection criteria at the time of assembly. Furthermore, the review revealed that the P-6 flange during Refuel II had been torqued and checked for elongation to ensure proper preload.

Refuel IV (1983)

A full video inspection of all of the CRDM flanges was performed. The inspection revealed twenty-four (24) indications of possible leakage and seven (7) confirmed leaks at locations D-10, F-6, F-12, G-5, H-6, M-7, and N-10.

The following action was taken to correct the confirmed leaks:

All of the bolts (56 total) from the seven flanges were removed, cleaned, and visually examined. Seven (7) bolts were observed to have had excessive removal torques and/or galled threads after removal. The threads exposed under the nut ring (due to the bolt being tight) became coated with boric acid crystals thus resulting in galling upon removal. These seven (7) bolts were replaced with new ones. The replacement bolts and one (1) old bolt were examined by PT. The flanges were also removed and cleaned; the nut ring threads were chased; and the flange gaskets were replaced with new 0.125" stiffness controlled gaskets (these gaskets were used due to a recommendation by MPR, a consultant to FPC on this problem, in their report to FPC to increase flange gasket pressure by (1) increasing bolt torques; and (2) using a stiffer gasket in order to alleviate the CRDM flange leakage problem. MPR had concluded that the flange leaks were due to lack of sufficient gasket pressure and recommended using a 0.140" thick gasket).

The video inspection also revealed that pitting had occurred in the bottom (and not on the top) of the flange gasket grooves thus indicating that the leak path was under the gaskets. The motor tube flanges however were for the most part clean. The amount of leakage and the severity of the spray supported the conclusion that water was leaking under the gasket. The observed pitting and spray was apparently caused by the water that leaked under the gasket flashing into steam during transients.