



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

June 15, 1988

Docket No. 50-302

Mr. W. S. Wilgus  
Vice President, Nuclear Operations  
Florida Power Corporation  
ATTN: Manager, Nuclear Licensing  
P. O. Box 219  
Crystal River, Florida 32629

Dear Mr. Wilgus:

SUBJECT: CRYSTAL RIVER UNIT 3 - EMERGENCY DIESEL GENERATORS -  
FINAL TEST REPORT (TAC NO. 67515)

On February 19, 1988, the Commission issued Amendment No. 104 to Facility Operating License No. DRP-72 for Crystal River Unit 3 dealing with surveillance testing of the emergency diesel generators (EDGs). The Safety Evaluation (SE) supporting that amendment contained several items which required further review and approval, and the amendment was not to become effective until such review and approval were completed.

You submitted the final EDG test results by letter dated February 29, 1988, and additional information on the same date in Licensee Event Report (LER) 87-019, Revision 1. Also, a meeting was held on March 30, 1988 during which further information was provided.

The results of our evaluation of the above information with respect to the open items in the SE are summarized in the enclosed Supplemental SE (SSE). We have concluded that matters affecting both interim operation of the EDG until Refuel VII and the interim Technical Specification (TS) change covering EDG testing have been satisfactorily resolved and the final test report and supporting documentation are approved with respect to these items. Qualifications in the SE regarding acceptability of interim operation and interim TS changes are deleted. Therefore, the TS requirements in Amendment No. 104 are effective as of the date of this letter. A corrected TS page reflecting this change is also enclosed.

As before, this amendment will apply only until the next refueling outage, at which time CR-3 is expected to be in conformance with the requirements of GDC-17 and further revised TSs as appropriate. You have proposed a long-term solution to be implemented during that refueling outage which we will address in separate correspondence.

In the SE, we noted that battery load management should be practiced during the interim period as necessary to assure maintenance of adequate battery capacity, especially when the battery charger has been shed from the bus. In discussions with members of your staff, it was stated that this concern was recognized and that guidance similar to that given for EDG load management would be provided to the operations staff. We will examine that guidance when it is available. In addition, the battery charger would be manually loaded on the EDG as soon as EDG loads permitted.

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Mr. W. S. Wilgus

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The additional information you provided regarding the SE request for confirmation of voltage dips is not adequate to permit the staff to draw satisfactory conclusions in that matter. We will address this issue further in separate correspondence.

With regard to EDG air inlet temperature, as noted in the SSE we consider this matter resolved. However, you should address our concerns regarding EDG room temperatures. We will address this issue further in separate correspondence.

Sincerely,

Original signed by

Herbert N. Berkow, Director  
Project Directorate II-2  
Division of Reactor Projects-I/II  
Office of Nuclear Reactor Regulation

Enclosures:

- 1. SSE
- 2. TS Page 3/4 8-5

cc w/enclosures:  
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Mr. W. S. Wilgus  
Florida Power Corporation

Crystal River Unit No. 3 Nuclear  
Generating Plant

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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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2. Verifying the generator capability to reject a load of  $\geq 515$  kw without tripping.
  - \* 3. Simulating a loss of offsite power in conjunction with Reactor Building high pressure and Reactor Building high-high pressure tests signals, and;
    - a) Verifying de-energization of the emergency buses and load shedding from the emergency busses,
    - b) Verifying that the 4160 v. emergency bus tie breakers open,
    - c) Verifying the diesel starts from ambient condition on the auto-start signal, energizes the emergency busses with permanently connected loads, energizes the auto-connected emergency loads through the load sequencer, and operates for  $\geq 5$  minutes while its generator is loaded with the emergency loads.
  - \*\*4. Verifying the diesel generator operates for at least 60 minutes. During the first 5 minutes but no greater than 6 minutes of this test the diesel generator shall be loaded to greater than or equal to 3248 kw but less than 3300 kw and during the remaining time of this 60 minute test, the diesel generator shall be loaded to greater than or equal to 2750 kw but less than 3000 kw,
  - \*\*5. Verifying that the auto-connected loads to each diesel generator for the worst case diesel generator operating condition do not exceed 3248 kw, and
  6. Verifying that the automatic load sequence timers are OPERABLE with each load sequence time interval within  $\pm 10\%$ .
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\* This test shall be performed in MODE 3

\*\* These revised requirements shall apply only until the end of Cycle VII.

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## ELECTRICAL POWER SYSTEMS

### SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

3.8.1.2 As a minimum, the following electrical power sources shall be OPERABLE:

- a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and
- b. One diesel generator with:
  1. Day fuel tank containing a minimum volume of 400 gallons of fuel,
  2. A fuel storage system containing a minimum volume of 20,300 gallons of fuel, and
  3. A fuel transfer pump, and
- c. One battery/charger combination supplying D.C. control power to the 230 kv switchyard breakers.

APPLICABILITY: MODES 5 and 6.

#### ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until the minimum required A.C. electrical power sources are restored to OPERABLE status.

#### SURVEILLANCE REQUIREMENTS

4.8.1.2.1 At least one circuit between the offsite transmission network and the onsite Class 1E distribution system shall be:

- a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability.
- b. Demonstrated OPERABLE at least once per 18 months during shutdown by transferring unit power supply from the normal circuit to the alternate circuit.
- c. Demonstrated OPERABLE by determining that at least one battery supplying D.C. control power to the 230 kv switchyard breakers is OPERABLE;



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SUPPLEMENTAL SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 104 TO FACILITY OPERATING LICENSE NO. DPR-72

FLORIDA POWER CORPORATION, ET AL.

CRYSTAL RIVER UNIT NO. 3 NUCLEAR GENERATING PLANT

DOCKET NO. 50-302

INTRODUCTION

By letter dated February 19, 1988 (Ref. 1), the NRC staff transmitted to Florida Power Corporation (FPC or the licensee) a Safety Evaluation (SE) related to the emergency diesel generator (EDG) loading and to License Amendment No. 104 for the Crystal River Unit No. 3 Nuclear Generating Plant (CR-3). In the SE, we accepted the proposed interim Technical Specification (TS) changes, as well as interim operation of CR-3 for one refueling cycle utilizing load management of the EDG as described in the SE, subject to review and approval of additional information to be submitted by the licensee.

By letter dated February 29, 1988, the licensee submitted final EDG test results. Additional information was provided in Licensee Event Report (LER) 87-019, Revision 1 dated February 29, 1988 and during a meeting with the NRC staff on March 30, 1988.

The purpose of this supplement is to update our SE by evaluating this additional information with respect to the items identified in the SE as subject to further review. The numbers below refer to sections from the SE issued with Amendment No. 104.

EVALUATION

1. Diesel Loading and 3. TS Amendment

The SE noted that acceptance of interim operation and of the proposed interim TS changes was based on calculated loads and preliminary test results, and subject to review and approval of the final test results. Worst-case load was calculated to be 3228 kw, and the higher testing level in the TS was 3248 kw.

The major electrical pump loads on train "A" were tested at or as near as practicable to each pump's conditions during a postulated large-break loss-of-coolant-accident (LOCA). The tests showed that the worst-case total load on EDG "A" is 3113 kw, below the calculated load and the TS test level, and within the 30-minute rating of the EDG. We find these test results acceptable.

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In addition, the SE noted that flows, and therefore kw loads, on some pumps have been reduced by throttling and that support for these reduced flows would be reviewed. The final test report and LER of February 29, 1988 provided additional information. The revised flow rates were reviewed by the staff and found acceptable.

The staff has reviewed and approved the final test report and other supporting documentation and concludes that the matters in these areas previously considered as requiring further review have been fully resolved and are acceptable as described above.

## 2. Related EDG Issues

The SE requested confirmation by testing of voltage dips at the 4160 volt and lower voltage levels resulting from block loading of the EDGs. The information submitted by the licensee in its February 29, 1988 letter is too brief and inadequate to permit the staff to draw definite conclusions regarding the adequacy of voltages to support functioning of all ESF equipment. We will pursue this matter with the licensee separately from issues of EDG loading and testing.

In the SE, we discussed the problem of excessive EDG inlet air temperature (above 105°F) when outside ambient air temperature exceeds 95°. In its letter of February 1, 1988, the licensee described a modification which would introduce outside ambient air at the EDG air intake and would maintain maximum inlet temperatures of 105°F at the diesel air intake. Based on our review, we conclude that the modification described by the licensee is acceptable. It is noted, however, that in its February 1, 1988 letter, the licensee also discussed the alternative of slightly derating the EDG for increased ambient temperature, and did not commit to implementing the modification. During the meeting of March 30, 1988, such commitment was made verbally and was confirmed in the licensee's letter to the Commission dated May 19, 1988, and the modification is in fact being installed. We therefore consider the matter of EDG air inlet temperature resolved. However, the design of the modification and the operational history of the ventilation fans providing ambient air for both combustion and EDG room cooling raise questions about the adequacy of EDG room cooling. The licensee has agreed to submit responses to our concerns, and we will pursue this matter separately with the licensee.

## CONCLUSION

Since the related issues discussed above will be handled separately, we find that matters affecting both interim operation of the EDG until the next scheduled refueling and the interim TS change covering EDG testing have been satisfactorily resolved, and the qualifications in the SE regarding acceptability of interim operation and of the interim TS changes may be deleted.

## Principal Contributors:

S. Saba  
H. Silver

Dated: June 15, 1988