

**Florida  
Power**  
CORPORATION

July 14, 1983  
3F-0783-16

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

SUBJECT: Crystal River Unit 3  
Docket No. 50-302  
Operating License No. DPR-72  
Supplement to Technical Specification  
Change Request No. 105

Dear Mr. Denton:

Florida Power Corporation, in the referenced correspondence and meetings, has requested interim relief from certain Technical Specification testing requirements. This relief is necessary because current plant design does not allow this testing to be accomplished in the manner described in our Final Safety Analysis Report or as supported by various NRC staff positions to which FPC is not committed (Standard Review Plan, Regulatory Guide 1.22, etc.). Subsequent reviews (December, 1982) of our test methodology resulted in FPC reporting this design deficiency (Reference 4) and requesting permanent relief from these requirements (Reference 1). The staff granted this relief (Reference 12) on an interim basis until Refuel IV which is currently drawing to a conclusion.

Recent discussions (Reference 5) between our respective staffs identified some outstanding concerns which needed to be resolved prior to further staff action on a request for permanent relief. These are addressed below. It also became apparent that the issuance of 10 CFR 50.92 ("snolly" amendment implementing regulations) had obscured the technical/safety issues somewhat. To facilitate staff action, FPC hereby submits a proposed no significant hazards evaluation which supplements the previously docketed information.

Surveillance procedures have been written (or modified) and will be run prior to entry into Mode 2 from the current outage which will verify the circuit continuity of all automatic actuation logic matrices using all input channel combinations (excluding those test groups which will be functionally tested on a monthly basis). This will be accomplished by modified refueling surveillances supplemented to minimize cycling plant equipment. Methods utilized

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will be procedurally controlled and have been discussed with your staff to assure mutual understanding of the basis for those methods utilized. FPC intends to include this expanded surveillance in subsequent refueling outages. FPC will also perform this expanded surveillance during cold shutdowns in excess of two weeks as a compensatory measure while we are operating under any interim relief granted on this matter.

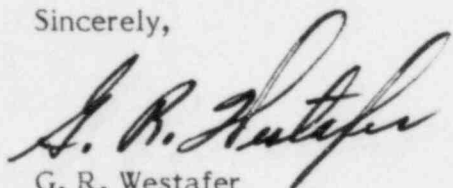
FPC has reviewed our testing and maintenance history regarding those portions of the ESFAS system which will be tested less thoroughly or less frequently. Specifically, we reviewed the Work Request records on relays, in general, and ESFAS in particular. No failures were identified which only would have been identified by the test scope which will be deferred. We also reviewed the test history for both the old monthly functional test (SP-355) and the refueling frequency integrated actuation test (SP-417). Again, no failures were discovered which only would have been identified by the scope of testing deferred.

As requested during our latest meeting (Reference 5), we have verified that operator training and associated instructions/procedures require the operator to follow automatic actuations with manual actuation once it has been verified that the automatic actuation was not spurious.

Copies of records and/or procedures described above are available for site inspection or will be forwarded to your staff unofficially for review. FPC does not consider such information to be appropriate or necessary for maintaining sufficient detail on the docket.

FPC wishes to reiterate its request for relief (as described in Reference 1 or otherwise) from meeting the Technical Specification required testing in the manner required by our FSAR or your position(s). This relief is requested to be granted on a schedule consistent with avoiding a forced plant shutdown at the next required test date which is anticipated to be in late August. As this amendment is necessary to prevent plant shutdown, we request that it be treated as an exigent or emergency request. We will keep your staff apprised of the next test date as it changes as a function of plant restart progress.

Sincerely,



G. R. Westafer

Manager

Nuclear Licensing and Fuel Management

KRW/mlg

cc: Mr. J. P. O'Reilly  
Regional Administrator, Region II  
U.S. Nuclear Regulatory Commission  
101 Marietta Street N. W., Suite 2900  
Atlanta, GA 30303

## References

1. G. R. Westafer (FPC) to H. R. Denton (NRC) dated January 14, 1983  
Technical Specification Change Request No. 105
2. G. R. Westafer (FPC) to H. R. Denton (NRC) dated January 20, 1983  
Supplemental Information to TSCRN 105
3. Meeting between FPC (K. Wilson, E. Good, and W. Kemper) and NRC (M. Fairtile, T. Dunning, J. Beard, M. Wigdor) January 17, 1983.
4. P. Y. Baynard (FPC) to J. P. O'Reilly (NRC) dated December 23, 1982  
Followup to Prompt Notification
5. Meeting between FPC (K. Wilson, E. Good, and G. Boldt) and NRC (R. Hernan, T. Dunning, and M. Wigdor) July 13, 1983
6. G. R. Westafer (FPC) to H.R. Denton (NRC) dated July 6, 1983  
Supplemental Information to TSCRN 105
7. CR3 Final Safety Analysis Report (Section 7.1.3.3.4)
8. IEEE-279-1971 Criteria for protection systems for Nuclear Power Generating Stations
9. Standard Review Plan, Section 7.1, Appendix B.11, pg 7.1 - 25
10. Regulatory Guide 1.22 Periodic Testing of Protection System Actuation Functions
11. Crystal River Unit 3 Integrated Reliability Evaluation Program (IREP) Appendix B
12. J. F. Stoltz (NRC) to J. A. Hancock (FPC) dated January 24, 1983  
Amendment G1 to Facility Operating License No. DPR-72.

**TECHNICAL SPECIFICATION CHANGE REQUEST NO. 105  
PROPOSED SIGNIFICANT HAZARDS EVALUATION**

**BACKGROUND ON REQUESTED ACTION**

Florida Power Corporation requested (Reference 1) an amendment to the Crystal River Unit 3 Technical Specifications to modify the Engineered Safety Features Actuation System (ESFAS) testing requirements to correct omissions in the ESFAS monthly functional test program. The omissions were basically twofold:

- (1) FPC had not performed the manual initiation functional unit test on a monthly basis, and
- (2) The scope of the automatic actuation logic functional unit test did not include all test groups.

While the problem's origin is complex (see Reference 4), it can be summarized as follows:

- a) The CR 3 Technical Specification, like most standard and custom technical specifications, requires monthly functional testing of ESFAS functional units.
- b) IEEE-279 (Reference 8) as endorsed by Regulatory Guide 1.22 (Reference 10) and Standard Review Plan Section 7.1 (Reference 9) require such functional testing be accomplished by testing actuated devices and equipment during power operation or by approved alternatives.
- c) FPC, in the CR 3 Final Safety Analysis Report, (Reference 7) committed to the preferred alternative (testing activated equipment) and sought to do so by judiciously selecting test groups which could be tested during power operation.
- d) As FPC gained operating experience, it was determined that the groupings alone were insufficient to prevent adverse test consequences and deleted testing certain groups without realizing that prior staff approval should have been gained since the program was thought to remain in compliance with technical specifications.
- e) In December of 1982, FPC discovered the inconsistency between our FSAR commitments and current testing practices, reported it appropriately (Reference 4), and requested the subject relief.

**DESCRIPTION OF REQUEST(S)**

1. Based on the fact that manual initiation is not relied on to perform a safety function, FPC requested that testing of this circuit be done on a refueling frequency.
2. To resolve the automatic actuation logic matrix concerns, the FPC requested modification of a footnote to allow staff concurrence with the FPC test scope. This flexible provision was chosen since it conformed to regulatory guidance (Reference 10) and would facilitate revisions to the test scope as procedural or hardware modifications increasing the scope of testing could be implemented without repeated license changes.

**TECHNICAL DESCRIPTION**

The ESFAS automatic actuation logic can be simplified to three basic "components": sensor input channels, logic matrix, and actuated equipment. The CR 3 design has distributed logic, (i.e., each actuated equipment component has its own 2-out-of-3 logic matrix). The CR 3 ESFAS, by design, does not have test circuitry which enables one to isolate the



actuated equipment from its logic matrix since this would introduce the potential for an additional failure. The design philosophy assumed that testing would be performed by actuating equipment.

The monthly functional testing scope proposed would include the ESFAS internal channel tests (R. B. Pressure High, High; R. B. Pressure; R.C.S. Pressure Low; R.C.S. Pressure Low, Low) and all actuated equipment to the extent ASME XI or other technical specifications require during power operation. It would also include at least one, two out of three matrix actuation for testing equipment end devices in groups HPI-3, LPI-1, and LPI-2. The portion of the ESFAS, other than these three (3) groups, which would not be tested, is the "making" of either of the two (2) remaining contacts in the actuation matrix, the circuit connections (wires) between the actuation relay matrix contacts, and the circuits (wires) from the relay matrices to the actuated equipment end devices. This portion of the system would be tested on a refueling (and potentially other cold shutdown of sufficient duration) frequency. It is important to note that the actuation matrix relays themselves will be tested on a monthly basis for either the "A" train or "B" train but only the continuity of the actuation matrix contacts for one of the three channel circuits will be tested on a monthly basis.

### NO SIGNIFICANT HAZARDS EVALUATION

The "Sholly Amendment" Implementing Regulation (10 CFR 50.92) requires consideration of three criteria when evaluating a license change request or similar actions. One must determine if the change would:

- a. Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- b. Create the possibility of a new or different kind of accident from any accident previously evaluated; or
- c. Involve a significant reduction in a margin of safety.

The key difference between this evaluation and the required review (by the licensee) for unreviewed safety questions (10CFR50.59) is the additional term "significant". Philosophically an additional concern was raised by "Sholly" which addressed the potential for the NRC to approve amendments involving "irreversible effects".

FPC does not consider the subject change request to involve a significant hazards consideration for the following reasons:

1. Fundamentally, it is FPC's position that the reduction in reliability in the ESFAS associated with this reduction in testing scope is extremely small. This is founded upon the following:
  - a. The ESFAS functional units, not associated with the "Automatic Actuation Logic" or "Manual Actuation " matrix circuitry testing will continue on a monthly frequency.
  - b. The portions of the circuitry (described above) are largely passive in nature and therefore not subject to rapid degradation or failure.
  - c. The "end devices" (valves, pumps, etc.) are tested at a frequency consistent with ASME XI requirements.
  - d. The entire ESFAS was functionally tested during the current refueling outage or during monthly functional tests (including all logic combinations) thereby verifying the operability of all active and passive components.

- e. FPC has reviewed the history of test results from previous functional tests (FPC procedures SP-417 and SP-355) and has not identified any failures related to contacts or circuit continuity that would not have been identified by the test scope proposed.
  - f. The testing of some actuation matrices constitutes type testing of similar matrices which will be tested less frequently. Any problems are likely to be random and thus this test "sample" supports the continued reliability of "untested" matrices.
  - g. FPC reviewed records of several other operating plants and was unable to identify any reported events which would indicate a lack of reliability in similar components utilized industry-wide.
  - h. The relays in question (Sylvania Bulletin 7305) carry 120VAC through the actuation contacts. By verifying the mechanical function of the relay (which is done monthly) a very high degree of confidence exists that the relay will operate.
  - i. The relays and associated circuitry are located in the Control Complex which is environmentally controlled. Furthermore no non-essential maintenance is allowed in these cabinets during power operation so damage between tests is not considered likely.
2. A comparison of the hazards associated with "full scope" testing and reduced scope testing during power operation clearly supports reduced scope testing.
  3. Requiring plant shutdowns to perform the testing not only cycles the plant through repeated startup and shutdowns with associated risk of anticipated transients associated therewith but also places a substantial economic burden on FPC customers (approximately \$750,000 per day replacement fuel costs).
  4. This request is not irreversible since should a hearing be granted and the outcome reverse the staff's decision; changing test scope would be quite possible. Furthermore the duration for this relief is not expected to exceed a fuel cycle.
  5. This request is more consistent with published examples of no significant hazards actions than those potentially involving a significant hazard.

The published examples likely to involve a significant hazards consideration are not similar as shown:

- i Does not involve a safety LIMIT
- ii Does not involve a limiting safety setting or limiting condition for operation BASES
- iii Does not involve a LCO and compensatory measures have been established
- iv N/A
- v N/A
- vi Does not involve an unreviewed safety question and certainly not a significant one
- vii This item is most similar to TSCRN 105. It is not considered of equal magnitude since the only safety margins reduced are clearly not significantly reduced.

The following published example, considered to be not likely to involve significant hazards considerations, is considered quite similar.

- (vi) A change which either may result in some increase to the probability or consequences of a previously-analyzed accident or may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria with respect to the system or component specified in the Standard Review Plan: for example, a change resulting from the application of a small refinement of a previously used calculational model or design method.

The Standard Review Plan (Reference 9) endorses Regulatory Guide 1.22 (Reference 10). Regulatory Guide 1.22 in Paragraph D.4 states the following:

"Where actuated equipment is not tested during reactor operation, it should be shown that:

- a. There is no practicable system design that would permit operation of the actuated equipment without adversely affecting the safety or operability of the plant;
- b. The probability that the protection system will fail to initiate the operation of the actuated equipment is, and can be maintained, acceptably low without testing the actuated equipment during reactor operation, and
- c. The actuated equipment can be routinely tested when the reactor is shut down."

This proposal is consistent with these limits in that:

- a. The current design does not allow sufficient flexibility for testing during power operations. This will be resolved as part of the long term corrective actions.
  - b. See Item 6 below.
  - c. FPC has been committed to such testing.
6. The ESFAS reliability has been reviewed in detail by the NRC Staff (Reference 11). The ESFAS system was modeled as part of the CR3 IREP. Furthermore the NRC contractor evaluated the ESFAS testing scope AS IT IS PROPOSED in TSCRN 105. The Staff's review showed that even with a less than ideal test scope the unavailability rate of the ESFAS systems as a result of ESFAS failures was acceptably small. Specifically, the annual unavailability rate of any one particular ESFAS component is typically on the order of  $10^{-6}$  to  $10^{-7}$ . This is compared with the unavailability rate of  $10^{-4}$  for personnel error induced loss of entire ESFAS (instead of a single component). Neither of these fault paths was a significant contributor to the overall core-melt probability. (NOTE: FPC has not endorsed the IREP but this data is referenced as a reasonable approximation suitable for comparison purposes).

Even if the ESFAS was to be re-evaluated using ideal test scope any increase in reliability is considered extremely unlikely to impact overall plant safety as demonstrated by the fact that the "less reliable" system has no measureable impact. The difference between test scope is thus considered demonstrably negligible.