

**Florida
Power**

CORPORATION
Crystal River Unit 3
Docket No. 90-302
Operating License No. DPR-72

February 19, 1998
3F0298-21

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Corrections and Clarifications for the Reactor Building Fan Starting Logic
Modification FMEA

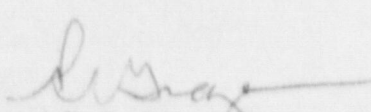
- References:
1. FPC to NRC letter, 3F1297-11, dated December 5, 1997, License Amendment Request #224, Revision 0, Reactor Building Fan Starting Logic Modification
 2. FPC to NRC letter, 3F0198-06, dated January 9, 1998, Additional Information for the Reactor Building Fan Starting Logic Modification

Dear Sir:

This letter provides several corrections and clarifications to the Failure Modes and Effects Analysis (FMEA), Revision 0, that was provided in Reference 2 above. The changes to the FMEA, described in Attachment A, do not affect the conclusions of the FMEA or LAR #224 (Reference 1). The revised FMEA, Revision 2 (also includes changes from Revision 1) is included in Attachment B.

There are no new commitments made in this correspondence. Should you have any questions or require additional information concerning this response, please contact Ms. Sherry Bernhoft, Manager, Nuclear Licensing at (352) 563-4566.

Sincerely,


R. E. Grazio, Director
Nuclear Regulatory Affairs

REG/pei
Attachments

xc: Regional Administrator, Region II
NRR Project Manager
Senior Resident Inspector
9802230145 980219
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**FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT 3
DOCKET NUMBER 50-302/LICENSE NUMBER DPR-72**

**CORRECTIONS AND CLARIFICATIONS TO THE
FMEA FOR THE REACTOR BUILDING FAN STARTING
LOGIC MODIFICATION**

ATTACHMENT A

Description of Changes to RB Fan FMEA

The following changes are clarifications and corrections of information presented in the FMEA provided in Reference 2 to this letter. The changes correct several factual errors and make editorial changes but do not affect the assumptions or acceptance criteria used in the FMEA. Therefore, these revisions do not impact the results or conclusions of the FMEA or LAR #224.

Page 2-2, third paragraph under Scope Boundary, a phrase was added "with minor changes expected to address specific details" because existing Emergency Operating Procedures (EOPs) will be revised to reflect the Reactor Building (RB) Fan modification. The original statement implied no changes were required for operating procedures. Crystal River Unit 3 (CR-3) committed to revising EOPs in LAR #224 because the modification will require operators to verify that only one RB Fan is running after an accident. Also in this paragraph, and in Note 1 to Section 4, it is stated that the current design/licensing basis requires both RB Fans, one RB Fan and one Building Spray pump or two Building Spray pumps. The second and third combinations are correct, however, two RB fans with no Building Spray pumps are not adequate. Therefore, the reference to two RB Fans as a mitigation option is deleted. The two RB fan case was never utilized as an acceptable configuration in the FMEA. Therefore, no conclusions of the FMEA are affected. Both sections of the FMEA were corrected. The appropriate combinations for RB Fans and Building Spray pumps were described in LAR #224.

Page 3-1, end of the first paragraph, states, "Due to Emergency Diesel Generator (EDG) loading considerations, the circuit modifications have been designed to make the A fan the preferred fan and the B fan the backup (the A diesel has more margin than the B)." The initial statement is correct, the "A" fan was chosen as the preferred fan due to EDG loading considerations. However, the parenthetical phrase is not correct (the "A" EDG does not have "more margin"). The phrase is not required for the FMEA and therefore has been deleted. The "A" fan was selected as the lead fan because the "A" EDG is more heavily loaded and it was considered less severe to load the fan on the "A" EDG during its normal block loading sequence rather than at a later time (as is more probable for the backup fan). The EDG load case study has demonstrated that either EDG can support the start of a RB Fan anytime during or after block loading. The above change is to System/Modification Description information that is provided in the FMEA for completeness. This change does not impact assumptions used in the analysis or the conclusions of the analysis.

Page 3-2, second sentence, states, "If the B actuation precedes the A actuation by more than six seconds, the B fan will start on slow speed first." This statement is replaced with "If the B actuation precedes the A actuation by more than the difference in time delays (approximately 4.5 seconds), the B fan will start on slow speed first." This starting sequence was accurately described in LAR #224 (Reference 1). In the following paragraph, the words "which provide the power supply" were changed to "associated with actuation," and "isolated" was changed to "separated." This change reflects that the wiring involved is not only for the power supply but also the logic actuation circuitry. The word "separated" replaced "isolated" because it better represents the IEEE 308 criteria that were used. The above changes are to System/Modification Description information that is provided in the FMEA for completeness. These changes do not impact assumptions used in the analysis or the conclusions of the analysis.

Page 4-2, Item 1.b, the remark states that the interlock wiring has "coil to coil isolation." This statement has been corrected to read "coil to contact isolation." This remark more accurately describes the isolation between the installed components. Also, a discussion was added to this section about the acceptability of a single fan running in fast speed. As discussed in LAR #224, a single fan in high speed results in acceptable consequences for the Service Water (SW) system. The FMEA considered the cases with one fan in high speed acceptable, but this was not documented in the report. No assumptions or conclusions of the FMEA are affected.

Page 4-4, Item 3, in the column entitled "Effect on System," a note states, "The three fans are powered from different Class 1E busses." The statement should read, "The two operable fans are powered from independent Class 1E busses." This revision does not change the intent of the initial statement but clarifies the wording which did not accurately reflect the CR-3 bus configuration. This change does not impact the conclusions of the FMEA.

Page 4-5, Item 4.f, the term "second fan" was replaced with "backup fan" to clarify that only one fan would be running at one time. This change is editorial in nature.

Page 4-7, Item 6.a, in the column entitled "Effect on System," it states, "No combination of postulated intermittent shorts has been identified which will result in the simultaneous energization of two fans. This is the only unacceptable fan combination. (See Note 1)." The wording of this has been changed for clarity to, "No combination of postulated intermittent shorts has been identified which will result in the simultaneous energization of two fans, which is the only unacceptable fan combination. (See Note 1)." This change is editorial in nature.

Page 4-8, Note 3, was rewritten for clarity. The "black box" failure described is actually two failures that were investigated to determine if there was a common mode for the failures. No single failure was found that could cause both fans to start and remain running. The information about the reliability of the equipment was moved to a separate paragraph to avoid confusion with the discussion of the "black box" failure. This change is editorial in nature.

In Section 5, Reference 12 was added as the basis for the remark in Section 4, Item 1.c. This reference was added for completeness and does not impact the conclusions of the FMEA.

**FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT 3
DOCKET NUMBER 50-302/LICENSE NUMBER DPR-72**

**CORRECTIONS AND CLARIFICATIONS TO THE
FMEA FOR THE REACTOR BUILDING FAN STARTING
LOGIC MODIFICATION**

ATTACHMENT B

Revised FMEA

February 13, 1998
102-097-05

Mr. Glenn Ward
Nuclear Operations Engineering
Florida Power Corporation
Crystal River Unit 3 Nuclear Power Plant
15760 W. Power Line Street
Crystal River, FL 34428-6708

Subject: Revision 2 for Crystal River Unit 3 Reactor Building Cooling Fans Logic
Modification Failure Modes and Effects Analysis (FMEA)

Dear Mr. Ward:

As requested in your fax of February 11, 1998, MPR has made some minor editorial changes to the Crystal River Unit 3 Reactor Building Cooling Fans Logic Modification Failure Modes and Effects Analysis in order to support your license amendment. This letter forwards MPR Report MPR-1887, Revision 2. We do not consider any of these changes to be due to "errors".

The report has been revised to clarify the minimum accident basis equipment requirements for Reactor Building (RB) cooling that allows for no RB fans running and to make the other wording changes you requested. These changes are detailed in the record of revision for the report. These changes did not impact the assumptions or conclusions of the FMEA.

As we agreed, no changes have been made regarding the comments about "black box" failures. Guidance provided by ANSI/IEEE Std. 352-1987, IEEE Guide for General Principles of Reliability Analysis of Nuclear Power Generating Station Safety Systems, recommends that "all failures that the analyst can conceive of be considered". At FPC's request, we have listed the more speculative, less likely failures in a separate category titled "Black Box" to highlight these failures. There is no reference to this term in any of the industry guidance on reliability analysis. Those listed represent all that we "can conceive of". The results of our analysis of these failures are contained in Section 4 of our report.

Please do not hesitate to call if you have any questions on this report.

Sincerely,

J. Douglas Hill
J. Douglas Hill

Enclosures

January 15, 1998
102-097-04

Mr. Glenn Ward
Nuclear Operations Engineering
Florida Power Corporation
Crystal River Unit 3 Nuclear Power Plant
15760 W. Power Line Street
Crystal River, FL 34428-6708

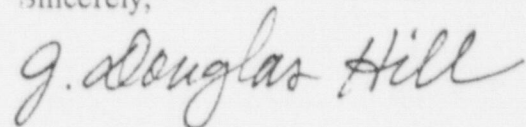
Subject: Crystal River Unit 3 Reactor Building Cooling Fans Logic Modification Failure
Modes and Effects Analysis (FMEA)

Dear Mr. Ward:

As requested in your fax of January 13, 1998 and during our follow-up phone call of January 15, 1998, this letter forwards MPR Report MPR-1887, Revision 1. The report has been revised to correct the error on page 3-1 as well as the changes on pages 3-2, 4-4, and 4-7. These changes did not impact the assumptions or conclusions of the FMEA.

Please do not hesitate to call if you have any questions on this report. We look forward to continuing to assist you on this important project.

Sincerely,



J. Douglas Hill

Enclosures