

Florida Power

CORPORATION
Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72

December 16, 1997
3F1297-24

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

Subject: Supplemental Response for the Resolution of Unresolved Safety Issue (USI) A-46
(Generic Letter 87-02) (TAC No. M69440)

- References:
1. FPC to NRC letter, 3F1295-18, dated December 31, 1995
 2. NRC to FPC letter, 3N0596-04, dated May 2, 1996
 3. NRC to FPC letter, 3N0197-20, dated January 28, 1997
 4. FPC to NRC letter, 3F0397-28, dated March 27, 1997
 5. FPC to NRC letter, 3F0897-01, dated August 1, 1997
 6. FPC to NRC letter, 3F1297-33, dated December 8, 1997

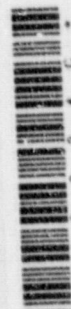
Dear Sir:

The purpose of this letter is to provide supplemental information to support Florida Power Corporation's (FPC) responses to the NRC's Request for Additional Information (RAI), dated January 28, 1997 (Reference 3). In addition, this letter provides clarification to FPC's RAI responses which were discussed during the NRC audit of USI A-46 (References 4 and 5).

On November 4 - 7, 1997, an NRC USI A-46 audit was performed by Messrs. P.Y. Chen and S.B. Kim of the NRC/NRR, and Mr. K. Bandyopadhyay of Brookhaven National Laboratory. The purpose of this audit was to verify that FPC's USI A-46 program was effectively being implemented. The NRC audit team recognized that FPC had implemented additional actions which were not specifically addressed in FPC's RAI responses. The team also requested clarification to some of the RAI responses. Both FPC and the NRC audit team agreed that a supplemental response was needed to address these remaining issues.

Responses to RAI question numbers 1, 2, 4, 10, 11, 12, 14b, 14c, 16, 18g, 20b, and 23, as submitted in References 4 and 5, have been clarified or amended, and are provided in Enclosure 2. As discussed with the NRC, the responses to the remaining RAI questions are either acceptable as originally submitted, or were found to be acceptable during the audit, and do not require any further clarification.

In addition, as discussed during the audit, the seismic adequacy of the Emergency Feedwater (EFW) tank has been confirmed. The evaluation is provided as Attachment B to this submittal as Calculation S97-0316. Also, as requested, FPC is providing copies of the original design basis calculations for selected tanks in Attachment F to this submittal.



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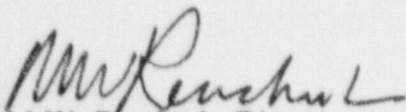
On December 2, 1997, FPC met with the NRC Staff to discuss the plans for the resolution of USI A-46. At that meeting, FPC stated the schedule for the resolution of USI A-46 will be improved by completing the resolution of all outliers prior to startup from Refueling Outage 11 instead of Refueling Outage 12. Seventy (70) outliers which were part of our Level I and Level II systems (safety-related), as defined by the System Readiness Review Plan, are being resolved prior to startup from the current outage. Forty-three (43) outliers in Level II and Level III systems (non-safety related) are labeled as post-restart and are being resolved prior to startup from Refueling Outage 11. However, of these forty-three (43) post-restart items, FPC has completed seventeen (17) items during the current outage. The remaining twenty-six (26) post-restart outliers will receive an operability assessment prior to restart from the current outage to confirm that the failure of any of the outstanding non-safety related outliers will not affect the ability to achieve safe shutdown of the plant. This assessment will also include a review of potential seismic interaction concerns.

As part of the closure to USI A-46, FPC will perform a confirmatory self-assessment of USI A-46 activities for CR-3. This effort will assess the completeness of the resolution of USI A-46 issues. This action will be completed prior to startup from Refueling Outage 11.

Enclosure 1 provides additional clarification and information that was discussed during the NRC audit. Enclosure 2 provides clarifications and supplemental information for selected RAI responses, as discussed above. Enclosure 3 provides the restart outlier resolution schedule and status. Enclosure 4 provides the post-restart outlier resolution schedule and status. Enclosure 5 provides a list of FPC commitments.

If you have any questions regarding this letter, please contact Mr. David F. Kunsemiller, Manager, Nuclear Licensing at (352) 563-4566.

Sincerely,



M.W. Rencheck, Director
Nuclear Engineering and Projects

MWR/cgp

cc: Regional Administrator, Region II (w/ encl. & att.)
Senior Resident Inspector (w/ encl. & att.)
NRR Project Manager (w/ encl. & att.)
P.Y. Chen (w/ encl. & att.)

Enclosures:

1. Response to NRC Audit Issues
2. Supplemental Response to NRC RAI
3. Restart Outlier Resolution Schedule and Status
4. Post-Restart Outlier Resolution Schedule and Status
5. List of Regulatory Commitments

Attachments:

- A.
 1. Introduction
 2. Caveat and Anchorage Review (Stevenson & Associates' Letter dated 12/9/97)
 3. "Extent-of-Condition" Review for Thin Base Metal Anchorage - Class 20
 4. Calculation S97-0541, Rev 0, "Confirmatory Study of Selected Safe Shutdown Equipment Anchorage for USI A-46"
- B. Calculation S97-0316, Rev. 0, "Seismic Evaluation of Emergency Feedwater Tank, EFT-2"
- C. Calculation S-96-0013, Rev. 1, "Qualification of Tanks per U.S.I. A-46"
- D. Calculation S97-0542, Rev. 0, "CR3 Structural Margin Evaluation (Study)"
- E. Screening Evaluation Work Sheets (SEWS) for RCPM-3A and RCPM-3B
- F. Design Basis Tank Calculations for:
 - The Pressurizer Quench Tank (Tag Number WDT-5)
 - Reactor Coolant Bleed Tanks (Tag Numbers WDT-3A, 3B, 3C)
 - Dedicated Emergency Feedwater Tank (Tag Number EFT-2)
- G. Letter on Grounding Resistor
- H. Memo on "Resolution of Questions Regarding Possible Mis-classification SSEL Equipment"
- I. Discussion on Specific Cabinet Internals and Weight Concerns
- J. Information Copies of Referenced Drawings

ENCLOSURE 1

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

RESPONSE TO NRC AUDIT ISSUES

NRC Audit Question 1:

The licensee will provide clarifications to its earlier response or additional information in response to the remaining RAI items (i.e., RAI Item Nos. 1, 2, 4, 10, 11, 12, 14b, c, 18g, and 23 [sic]). The response will address the SE open issues directly on an item-by-item basis.

FPC Response:

Supplemental information and clarifications for each of the remaining RAI items listed and open issues from the SER are provided in Enclosure 2. In addition, supplemental information for RAI items 16 and 20b are also provided.

NRC Audit Question 2:

The licensee will confirm that all equipment is anchored and anchorage has been inspected following the GIP-2 guidelines. In addition, the licensee will prepare bounding calculations in accordance with GIP-2 for verification of anchorage. As a minimum, all poorly or improperly anchored equipment will be identified and checked for anchorage adequacy.

FPC Response:

FPC's response to the specific information requested above is discussed in FPC's response to NRC RAI Request Number 12 in Enclosure 2 and in Attachment A of this submittal. The bounding calculations are contained in Calculation S97-0541, which is provided in Attachment A of this submittal.

NRC Audit Question 3:

The licensee will confirm that all GIP-2 caveats have been verified during seismic "walkdown" and satisfied for all equipment items.

FPC Response:

Supplemental information to address this issue is provided in response to NRC RAI Request Number 11 in Enclosure 2. In addition, an independent review was performed by Stevenson and Associates. The assessment report is included in Attachment A of this submittal.

NRC Audit Question 4:

The licensee will develop a top level procedure for operator action, in general, and relay chatter, in particular, and submit it for staff review.

FPC Response:

FPC procedure AP-961, Earthquake, is being revised to provide guidance to operators on how to cope with relay chatter subsequent to a seismic event and identification of bad actor relays. FPC will submit the revised AP-961 to the NRC for information.

FPC will revise Section 6 of the CR-3 Plant Specific Procedure (PSP) to add a description of the relay functionality review that was performed as part of the relay walkdown. This is discussed further in Enclosure 2, SER Concern 2.

NRC Audit Question 5:

The licensee will develop a complete list of equipment in the USI A-46 safe shutdown paths and confirm that no additional equipment items need to be included in the current list.

FPC Response:

The current Safe Shutdown Equipment List (SSEL) is considered complete. The list has been prepared and thoroughly reviewed by a multi-disciplined team which included the Operations Department.

FPC plans to perform a confirmatory audit to address this SSEL issue prior to the end of Refueling Outage 11. This is related to commitment 3F1297-24-0001 Enclosure 5.

NRC Audit Question 6:

The licensee will verify that all equipment items are appropriately classified and re-evaluate inappropriately classified equipment.

FPC Response:

FPC has completed a review of the specific components discussed during the Audit (Transfer Switches VBXS-1A, 1B, 1C, 1D, 1E, 3A, 3B, 3C, 3D, DPXS-1). In addition, FPC has completed a review of all other equipment classifications. This review indicates the classification of the identified components is appropriate as shown on the FPC PSP Screening Evaluation Work Sheets (SEWS). This is discussed further in Attachment H of this submittal.

NRC Audit Question 7:

The licensee will verify whether the Diesel Generator grounding resistors need to be included in the safe shutdown equipment list. If so, the seismic adequacy of the ceramic insulators in the load path should be investigated.

FPC Response:

FPC has completed a review of the diesel generator grounding resistor. The review determined that the ground resistor is not required for the safety function of the diesel generator or for safe shutdown capabilities. This is discussed further in Attachment G of this submittal.

NRC Audit Question 8:

The licensee will confirm that the questionable cabinet internals (cantilever box and ceramic insulators) are, in fact, acceptable (or otherwise have been modified). The licensee will also confirm that similar situations do not exist in other equipment.

FPC Response:

FPC has completed a review of the above listed components. It is FPC's understanding that the cantilever box issue dealt with the Anticipated Transient Without Scram Logic Cabinet (tag number ATCP-1). The ceramic insulator issue dealt with 480V Turbine Auxiliary Bus A (tag number MTSW-3A) and the 480V Reactor Auxiliary Bus A (tag number MTSW-3C). The issue with 4160V Engineered Safeguards (ES) Bus 3B - North (tag number MTSW-2E) and the 4160V ES Bus 3B - South (tag number MTSW-2F) dealt with a potential transformer mounted on top of the cabinets. This is discussed further in Attachment I of this submittal.

NRC Audit Question 9:

The licensee will submit sample calculations for cable and conduit supports.

FPC Response:

Subsequent to the USI A-46 audit, FPC provided sample design basis calculations for cable and conduit supports to the NRC. FPC has received feedback from the NRC that indicates there are no open issues with FPC raceways. This subject is also discussed in the supplemental response to NRC RAI Request Number 16 in Enclosure 2. FPC has performed a Limited Analytical Review (LAR) of select cable and conduit supports to verify our earlier conclusion that CR-3's configuration is acceptable. The LARs are included in calculation S97-0542 (Attachment D of this submittal).

NRC Audit Question 10:

The licensee will complete and then submit for staff review calculations for outlier tanks.

FPC Response:

In Reference 5, FPC stated in the original response to NRC RAI Request Number 23 that minor programmatic deviations were discovered. These deviations consisted of having several tanks and heat exchangers not having completed calculations as required by PSP. These tanks and heat exchangers were declared outliers originally due to the lack of formal calculations. The following items were listed as post-restart outliers. However, as committed in Reference 5, FPC has completed the calculations. The specific tanks in question for this concern are: Reactor Coolant (RC) Drain Tank 3A (tag number WDT-3A), RC Drain Tank 3B (tag number WDT-3B), RC Drain Tank 3C (tag number WDT-3C), RC Drain Tank (tag number WDT-5), Main Condenser A (tag number CDHE-4A), and Main Condenser B (tag number CDHE-4B). The calculation, S-96-0013, Revision 1, has been completed. This calculation is included in Attachment C of this submittal.

The Condensate Storage Tank (tag number CDT-1) has been recently identified as an outlier. An error in the existing calculation was found during a review by Dr. Robert Kennedy. His review was part of a third party assessment of our structural extent of condition review. A Precursor Card was generated to document this error (PC 97-7423). This issue was discussed with the NRC during the audit. CDT-1 is included in the group of

post-restart outliers. FPC has performed a seismic margin calculation as part of the operability assessment. This calculation is contained in Attachment D of this submittal. FPC has made an attempt to locate original design basis calculations for this tank and has been unsuccessful to date. FPC has initiated another Precursor Card to document our inability to locate this calculation in a timely manner (PC 97-8523).

NRC Audit Question 11:

The licensee will confirm that all outliers have been satisfactorily resolved through design documentation and field modifications.

FPC Response:

Enclosures 3 and 4 provide outlier resolution schedule and status lists. FPC will provide confirmation of completion of resolution of these outliers. The schedule for resolution of A-46 has been improved from FPC's earlier commitment of Refueling Outage 12. FPC will resolve the seventy (70) identified restart outlier issues prior to the unit restart from the current outage and complete the resolution of post-restart outliers by Refueling Outage 11. Currently, FPC has completed seventeen (17) of the forty-three (43) post-restart outliers. A status of outlier resolutions was discussed with the NRC in a meeting held on December 2, 1997. The remaining twenty-six (26) post-restart outliers will receive an operability assessment prior to restart from the current outage to confirm that the failure of any of the outstanding non-safety related outliers will not affect the ability to achieve safe shutdown of the plant.

As part of the closure to USI A-46, FPC will perform a confirmatory self-assessment of USI A-46 activities for CR-3. This effort will assess the completeness of the resolution of USI A-46 issues. Upon completion of this confirmatory review of the A-46 program, FPC will inform the NRC of resolution of USI A-46 for CR-3. This action will be completed prior to startup from Refueling Outage 11.

ENCLOSURE 2

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

SUPPLEMENTAL RESPONSE TO NRC RAI

**VERIFICATION OF SEISMIC ADEQUACY OF
EQUIPMENT IN OPERATING REACTORS
UNRESOLVED SAFETY ISSUE (USD) A-46,
GENERIC LETTER 87-02**

CRYSTAL RIVER UNIT 3

SUPPLEMENTAL RESPONSE TO NRC RAI

UNRESOLVED SAFETY ISSUE (USI) A-46, GENERIC LETTER 87-02

By letter dated December 31, 1995 (3F1295-18), Florida Power Corporation (FPC) provided the documentation of the seismic evaluation (The Report) performed to address USI A-46 at Crystal River Unit 3 (CR-3). The evaluation was performed using FPC's Plant Specific Procedure (PSP) for resolving USI A-46.

By NRC letter dated January 28, 1997 (3N0197-20), the NRC determined that additional information was necessary to complete their review of the CR-3 Report and provided a Request for Additional Information (RAI). FPC completed responses to the NRC's RAI and submitted them by FPC letters dated March 27, 1997 (3F0397-28), and dated August 1, 1997 (3F0897-01). In addition FPC submitted a letter to the NRC dated December 8, 1997 (3F1297-33) providing "Plans for Resolution of USI A-46 and Large Bore Piping and Piping Supports."

The NRC conducted an Audit of the CR-3 USI A-46 Program during November 4 - 7, 1997, to verify that the program was effectively being implemented. Responses to RAI questions 1, 2, 4, 10, 11, 12, 14b, 14c, 16, 18g, 20b, and 23 have been clarified and amended. No additional information for the other RAI questions is included with this submittal, based on our understanding that those issues were satisfactory and closed by the NRC audit team. The following provides FPC's responses to the above RAI questions.

NRC RAI REQUEST NUMBER 1

In the Safety Evaluation (SE) (Reference 1), the staff has taken several exceptions and identified specific issues related to your A-46 implementation procedures (References 2 and 3). Since you performed the equipment verification (called walkdown) before receiving the SE, your walkdown report*(Reference 4) does not completely address the staff concerns. Moreover, since the walkdown report basically contains a *summary* of the data, it is not clear from the report whether and how many of the staff concerns have been addressed through the walkdown. Therefore, please provide the necessary information to show that the open issues identified in the SE (Reference 1) have been addressed during the walkdown.

FPC SUPPLEMENTAL RESPONSE:

The supplemental responses are included herein, the positive findings of the NRC A-46 audit team, and this response to the SER will address the Staff's concerns. The following information is provided to address each of the SER concerns.

SER Concern 1:

The licensee's approach to achieve and maintain hot standby for 72 hours following an SSE is acceptable provided that the licensee confirms that the equipment necessary to assure core decay heat removal for 72 hours in both of the safe shutdown paths are seismically adequate.

FPC Response:

The following information is provided to summarize FPC's efforts to address the above issue.

Safe Shutdown Equipment List:

FPC has developed a comprehensive Safe Shutdown Equipment List (SSEL). Not only did this list include the equipment required to safely shut down the plant following an earthquake but also included electrical equipment that might contain control devices (refer to NRC RAI Question Number 4 for further information). The list was prepared using the guidelines of the GIP. The list was prepared by individuals trained by Seismic Qualification Users' Group (SQUG). This list was reviewed and accepted by FPC's Operations Department.

* Unless otherwise mentioned, "the report" means Reference 4, and all subsequent page number and section number citations are from this report.

Seismic Walkdown:

FPC has completed all the seismic review walkdowns. These walkdowns were done by experienced and well trained Seismic Capability Engineers familiar with the GIP and FPC's PSP. The walkdowns were done using the PSP. However, FPC maintains the GIP caveats were implicitly included due to the experience and knowledge of the Seismic Review Team (SRT). The SSEL and walkdown effort had a third party review as documented in the report (Reference 1). FPC has recently had another review of our program to compare GIP caveats against the PSP SEWS evaluation. This review did not find any concerns. This review also performed an anchorage study that shows anchorage acceptable (except for those identified as outliers).

Outliers:

The seismic screening resulted in one-hundred-thirteen (113) outliers out of approximately eight hundred (800) items of equipment reviewed. FPC performed a ranking of the outliers and made a commitment to resolve the more safety significant outliers (seventy) prior to restart from the current outage. On December 2, 1997, FPC met with the NRC Staff to discuss the plans for the resolution of USI A-46. At that meeting, FPC stated the schedule for the resolution of USI A-46 will be improved by completing the resolution of all outliers prior to startup from Refueling Outage 11 instead of Refueling Outage 12. Seventy (70) outliers which were part of our Level I and Level II systems (safety-related), as defined by the System Readiness Review Plan, are being resolved prior to startup from the current outage. Forty-three (43) outliers in Level II and Level III systems (non-safety related) are labeled as post-restart and are being resolved prior to startup from Refueling Outage 11. Of those forty-three (43) post-restart items, FPC has completed seventeen (17) items during the current outage. The remaining twenty-six (26) post-restart outliers will receive an operability assessment prior to restart from the current outage to confirm that the failure of any of the outstanding non-safety related outliers will not affect the ability to achieve safe shutdown of the plant. The assessment will also include a review of any seismic interaction.

SER Concern 2:

The licensee's approach to resolve relay issues is acceptable provided that the licensee revises Section 6 of CR-3 PSP, Revision 1, to include its commitments to the staff positions as delineated in Reference 8.

FPC Response:

FPC will revise Section 6 of the CR-3 PSP to add a description of the relay functionality review that was performed as part of the relay walkdown (Commitment

3F1297-24-06). In addition, FPC will revise procedure AP-961, Earthquake, to include identification of the bad actor relays and guidance for appropriate operator action to cope with the malfunction of the relays. There is a commitment to provide the appropriate operator procedure for dealing with relays (Commitment 3F1297-24-04).

SER Concern 3:

The licensee's approach to evaluate the adequacy of equipment anchorage is not completely acceptable. The staff will verify the licensee's implementation of Section 4.4 of the GIP, Revision 2, and the summary report's documentation of the results of anchorage evaluation and how any outliers are handled.

FPC Response:

FPC acknowledges there are three important attributes to verify adequate anchorage: verifying actual anchorage is installed, verifying proper installation of the anchorage, and verifying there is adequate capacity of the anchorage.

Verifying Anchorage Installation Exists:

The primary action to verify the existence of anchorage has been satisfied. FPC performed a 100% inspection of accessible anchorage and hands-on check of all non-energized equipment and energized equipment with external anchorage. There is a specific caveat on the PSP SEWS to verify the existence of anchorage. This has been documented on all applicable SEWS (the exception is line mounted equipment). Where the anchorage was missing, or considered poor, then that equipment was declared an outlier. Out of the one-hundred-thirteen (113) outliers, approximately twenty-seven (27) are because of missing or poor anchorage. At the conclusion of the outlier resolution effort, there will be no unanchored SSEL equipment. The PSP also required the Seismic Review Team (SRT) to verify anchorage load path.

In addition to the USI A-46 effort, there have been many inspections and other programs at FPC that help verify the existence, or other concerns with anchorage. The Structural Maintenance Rule Inspections made hands-on inspections of virtually every accessible anchorage in the plant. The System Readiness Review Plan performed walkdowns of plant equipment.

Verifying Proper Anchorage Installations:

The second area regarding proper installation has also been satisfied. All anchor bolts were hand checked and visually inspected where accessible during the A-46 walkdowns. Again, any concerns noted were required to be documented on the SEWS.

In addition to the A-46 walkdowns, the Structural Maintenance Rule Inspection performed a visual inspection of anchorage in the plant (including non-SSEL and SSEL equipment). The Maintenance Rule walkdowns also included a wrench tightness test that was performed for one-hundred-ninety-three (193) expansion anchors using methods based on the GIP. The one-hundred-ninety-three (193) expansion anchors tested were a subset of the three-hundred-fifty-four (354) expansion bolts included in the scope of the Maintenance Rule. Anchors tested represented approximately sixty (60) components; all but six (6) are SSEL items. Out of the one-hundred-ninety-three (193) bolts tested, three bolts failed the acceptance criteria. A follow up analysis concluded the loose bolts did not adversely affect the adequacy of the equipment. This information is contained in the Structural Maintenance Rule Inspection Report.

Verifying Anchorage Capacity:

The third area deals with the capacity of the anchorage. The program at FPC relied on the judgment and experience of well trained Seismic Capability Engineers to make the determination if the capacity of the anchorage is adequate. FPC understands the Staff's concern about making an engineering judgment about the adequacy of an anchorage capacity. To address this issue, FPC has performed a bounding anchorage calculation based on the requirements of the GIP.

This bounding calculation took a subset of the electrical equipment contained in the SSEL and performs a bounding calculation. The intent of this bounding calculation is to envelope the equipment at CR-3 and to ensure equipment anchorage adequacy. These calculations are done to the requirements of the GIP. FPC maintains that mechanical equipment is inherently more rugged and generically better anchored. Therefore, no further review of mechanical equipment is warranted. This study included the following equipment classes:

Equipment Class 1	Motor Control Centers
Equipment Class 2	Low Voltage Switchgear
Equipment Class 3	Medium Voltage Switchgear
Equipment Class 4	Transformers
Equipment Class 14	Distribution Panels
Equipment Class 16	Battery Chargers and Inverters
Equipment Class 20	Instrument and Control panels and cabinets

A summary of the results of the calculation is included in Attachment A of this submittal. Calculations to support this study are included in Attachment A (FPC Calculation S97-0541).

The NRC has noted several items of equipment that they felt needed further review. These items are "noted" in Attachment A. The specific items of equipment and the

findings of the FPC review are documented in Attachment A of this enclosure. Other than the item discussed next, all equipment anchorages were found to be acceptable.

In addition, the NRC has identified an issue with an electrical enclosure that was anchored through the base sheet metal without stiffened elements. Specifically, this is the SCR Cabinet for AHHE-4A and AHHE-4B (tag number AHCP-4). To address this specific concern, FPC has generated a Precursor Card to document the new anchorage outlier. FPC also has generated an "extent-of-condition" review to verify there are no other cabinets with this concern. The "extent-of-condition" review found no additional items (see Attachment A of this enclosure for more information).

As part of our confirmatory self-assessment, FPC will also perform additional anchorage calculations for approximately one hundred (100) electrical components. This is approximately 50% of the total scope of SSEL electrical components. Based on the results of the evaluation, FPC may expand the scope of the calculations utilizing statistical methods.

This concern is also being addressed by FPC response to RAI Question 12, and information contained in Attachment A of this submittal.

SER Concern 4:

The licensees' approach to evaluate cable and conduit raceway is not acceptable. The licensee should submit a report summarizing the results of the cable and conduit raceways assessment to verify its adequacy. The report should also detail the criteria and methodology mentioned in Reference 7.

FPC Response:

The evaluation of Cable and Conduit raceways was discussed during the NRC Audit. The walkdowns by the Staff indicated agreement that the CR-3 raceways are a rugged design. In addition, sample design basis calculations were provided to the NRC. FPC has received feedback from the NRC that indicates there are no open issues with FPC raceways.

However, FPC said it would provide additional justification. FPC management voluntarily initiated a structural extent-of-condition study, based on the IPEEE seismic margins program to verify adequacy of plant structures. To provide this justification, the seismic margin analysis included an expansion of scope to address electrical raceways. This involved a more detailed review of electrical raceways than is typically performed in a seismic margins program. FPC has performed two Limited Analytical Reviews (LAR) for raceways using the GIP method. One LAR on a cable tray was performed to address the Thermo-Lag issue. These calculations showed positive results

and further evaluated the acceptability of FPC's raceways. These LARs are included as part of FPC Calculation S97-0542. This calculation is included as Attachment D of this submittal.

Oversight of this effort was performed by Dr. Robert Kennedy. Dr. Kennedy concluded that CR-3 electrical raceways should not require further review, especially if some LARs (mentioned above) are performed as a part of a seismic margin study.

SER Concern 5:

The proposed guidelines for evaluating the seismic adequacy of tanks and heat exchangers are acceptable when proper documentation is provided. The licensee should include the evaluation of seismic adequacy of core flood tanks in the A-46 program activities for resolving USI A-40.

FPC Response:

FPC has completed analysis of the SSEL tanks and heat exchangers identified on the SSEL. There are eighty-seven (87) tanks and heat exchangers (equipment class 21) currently listed in the SSEL. The following list of calculations contain qualification of the listed tanks and heat exchangers. There is a subset of tanks and heat exchangers that are qualified by similarity and not specifically referenced in a calculation. That is, the item is qualified by reference to an item that is qualified by a calculation listed below. These calculations are included in the following FPC calculations:

1. S94-0011, Revision 0, submitted previously as Attachment C, in Reference Letter 5. This calculation includes calculations for five tanks and heat exchangers.
2. S96-0013, Revision 0, submitted previously as Attachment 5, in Reference Letter 4. This calculation includes calculations for forty-two tanks and heat exchangers.
3. S96-0013, Revision 1, included with this submittal in Attachment C. This revision adds calculations for RC Bleed tanks (tag numbers WDT-3A, 3B, and 3C), RC Drain tank (tag number WDT-5), and the Main Condensers (tag numbers CDHE-4A and 4B).
4. S97-0316, Revision 0, included with this submittal in Attachment B. This calculation includes the new calculation to resolve the outlier identified for the Emergency Feedwater Tank (tag number EFT-2).

The Condensate Storage Tank (tag number CDT-1) has been recently identified as an outlier. An error in the existing calculation (S94-0011) was found during a review by

Dr. Robert Kennedy. His review was part of a third party assessment of FPC's structural extent of condition review. A Precursor Card (PC 97-7423) was generated to document this error. This issue was discussed with the NRC during the audit. CDT-1 is included in the group of post-restart outliers. For an operability assessment, FPC has performed a seismic margins calculation. This calculation is contained in Attachment D of this submittal. FPC has made an attempt to locate original design basis calculations for this tank and has been unsuccessful to date. FPC has initiated another Precursor Card (97-8523) to document our inability to locate this calculation in a timely manner.

The Core Flood tanks were also discussed during the audit. These tanks are part of the Nuclear Steam Supply System (NSSS). The NSSS has been specifically excluded from review by the A-46 program. Furthermore, drawings were produced and shown to the Staff during the audit that showed the core flood tanks clearly do not fall within the scope of USI A-40. USI A-40 was created to verify the acceptability of large flat bottomed tanks. The drawings showed the core flood tanks to be elevated tanks, supported by legs. Therefore, FPC concludes that no further work is required for these tanks.

SER Concern 6:

The ground response spectra and the approach used in developing the in-structure response spectra are acceptable provided that the licensee's verification of the seismic adequacy of equipment and anchorages is in accordance with the staff position delineated in Sections 2.3 and 2.7 of this evaluation and in Reference 8.

FPC Response:

In Section 2.3 of the SER, the NRC took exception to FPC's anchorage position. Since the issuance of the SER, FPC has undertaken additional steps to provide assurance that the equipment identified on the SSEL is adequately anchored. These additional steps have been discussed with the Staff during the Audit and are again extensively addressed in this submittal. Specifically, anchorage is addressed in FPC's responses to SER Concern 3, RAI Question 12, and Attachment A of this submittal.

In Section 2.7 of the SER, the NRC took exception to FPC's exclusion of certain GIP caveats. The information provided during the audit and with this submittal addresses the Staff's comments. FPC has reviewed the differences between the PSP and the GIP caveats and found that they are acceptable and do not adversely affect any of the conclusions of our program. This issue is discussed further in FPC's response to RAI Question 11 and in Attachment A of this submittal.

SER Concern 7:

The proposed criteria and procedures for addressing the generic caveats for equipment classes are not completely acceptable. The staff will use GIP generic caveats to evaluate the licensee's assessment of equipment seismic adequacy in its A-46 implementation summary report.

FPC Response:

As stated above, information provided during the audit and with this submittal are intended to address all the Staff's concerns on this issue. This issue is discussed further in FPC's response to Question 11 and in Attachment A of this submittal.

NRC RAI REQUEST NUMBER 2

On Page 14, third paragraph, the walkdown summary report (Reference 4) states that "the methodology used to identify the safe shutdown paths and components is in accordance with the Plant-Specific Procedure (PSP) except as noted herein." However, the exceptions are not found in the report. Please identify the exceptions clearly so that the staff can evaluate their impact.

FPC SUPPLEMENTAL RESPONSE:

In a submittal dated August 15, 1994 (3F0894-02), FPC provided the discussion of methodology for achieving and maintaining HOT STANDBY following a design basis seismic event at CR-3. The FPC A-46 program scope includes the systems and corresponding equipment necessary to ensure that HOT STANDBY can be achieved and maintained for 72 hours following an SSE. For CR-3, given a loss of offsite power, it is not possible to cooldown to a HOT SHUTDOWN condition within 72 hours. FPC stated that for this condition, an additional 52 hours are required to cooldown to the decay heat system entry point. This is due to the limited capability to relieve steam through the atmospheric dump valves.

Recently, FPC has performed additional calculations of the plant response to a natural circulation cooldown using a more sophisticated model and more realistic assumptions. This analysis was performed to demonstrate compliance with 10 CFR 50, Appendix R, Section III.L.1(d), which is more restrictive than the PSP in that it requires it be demonstrated that the plant can be cooled to cold shutdown conditions within 72 hours. This model used to demonstrate compliance with Appendix R includes a more realistic decay heat model and takes credit for the heat removed through operation of the turbine driven emergency feedwater pump. The results of this calculation indicate that it is possible for CR-3 to cool down to the point at which the decay heat removal equipment could be used in 72 hours following a loss of off-site power as stated in the PSP. The results of this analysis is presented in more detail in letters to the NRC dated August 29, 1997 (3F0897-48), and December 10, 1997 (3F1297-04).

This revised analysis allows FPC to conclude that the methodology used to identify the safe shutdown paths and components is in accordance with the Plant-Specific Procedure PSP. Therefore, based on the above resolution, FPC has no identified exceptions.

NRC RAI REQUEST NUMBER 4

In item No. 10 on Page 16 of the report, the equipment types that were not included for seismic evaluation include "equipment...which, upon loss of power, will fail in the desired position or state...." Please verify that, under *all* concerned plant conditions, the *control devices* of such equipment that may cause a failure of the equipment in an undesirable state have been included in the safe shutdown equipment list.

FPC SUPPLEMENTAL RESPONSE:

When FPC expanded the scope of the SSEL in response to Revision 1 of the PSP, all electrical enclosures (e.g., cabinets, panels, switchgear, MCCs) were evaluated. The evaluation excluded only enclosures that are clearly not important to safe shutdown of the plant. For example, these systems included fire service, and security. The remaining electrical enclosures that might contain control devices were included in the SSEL. The intent was to include any enclosure that might contain relays or other control devices associated with equipment on the SSEL. In the process, FPC conservatively included enclosures containing control devices for equipment not required for safe shutdown. This included equipment not identified during the original review. Therefore, there is an expectation that the control devices for equipment not on the SSEL have been evaluated in the same manner as the control devices for equipment that are on the SSEL. Thus, there is a high degree of confidence that these control devices will not cause a failure of equipment (which is not on the SSEL) in an undesirable state.

NRC RAI REQUEST NUMBER 10

The report on Page 36, Section 5.1.3 states that "all [underline added] reinforced concrete pads are integrally attached to the concrete floors by dowels." Please explain how this was verified.

FPC SUPPLEMENTAL RESPONSE:

FPC acknowledges the Staff's concern about anchoring equipment to raised pads that may not be reinforced, or attached to the base slab. As part of the A-46 review FPC performed walkdowns and reviewed applicable plant drawings to show that equipment pads are reinforced. Where applicable this information is documented on the SEWS. If this information could not be readily determined by a review of the plant drawings, then FPC conservatively declared the component an outlier. For example, the Control Complex HVAC Air Compressors (tag numbers AHP-01A, 01B, 01C, and 01D) are included as outliers because pad reinforcement could not be determined. The resolution of these outliers required an ultrasonic test be done on the anchor bolts. The UT exam showed the anchor bolts themselves were doweled through the raised pad into the floor. Therefore, the anchorage for these items is considered adequate.

NRC RAI REQUEST NUMBER 11

In Reference 1, the staff has stated that meeting the caveats is an essential element of the experience-based approach documented in the Generic Implementation Procedure (GIP) and that it would use the GIP caveats to evaluate the licensees' USI A-46 resolution program. There are several caveats that are listed in the GIP but not in the PSP (Reference 2). It is acknowledged that some justifications are provided in the Technical Basis document (Reference 3) to show that the missing caveats are not of concern for Crystal River, mostly because of low seismicity. But, as the staff had already pointed out, meeting the caveats is a prerequisite for application of the experience-based approach. Caveats were prepared by experts considering potential vulnerabilities of equipment. The purpose was that an experienced engineer would go over the *entire* checklist of caveats to verify that there were no concerns for the identified vulnerabilities. For example, consider Caveats 4 and 7 of Equipment Class 1. One may make a plant-specific case for exceeding caveat limits on attached weights and cutouts but there should be some limits even for a low-seismicity site. Elimination of the caveats from the list makes the engineer systematically verify *site-specific conditions* and judge whether such conditions are acceptable given the identified *generic* vulnerability concerns. Therefore, the staff does not consider the justifications provided in Reference 3 to be adequate and please demonstrate how the missing caveats (a potential list is provided below) were satisfied for Crystal River 3.

Class 1	Caveat	4 - Attached weight of 100 pounds or less 7 - Cutouts not large 8 - Door/brackets secured 9 - Natural frequency relative to 8 Hz limit considered
Class 2	Caveat	3 - Side-to-side restraint of breaker 5 - Attached weight of 100 pounds or less 8 - Cutouts not large 9 - Door secured
Class 3	Caveat	5 - Attached weight of 100 pounds or less 8 - Cutouts not large 9 - Doors secured
Class 4	Caveat	8 - Weak-way bending 10 - Doors secured
Class 5	Caveat	4 - Check of long unsupported piping 8 - Relays (if any)
Class 6	Caveat	3 - Check of long unsupported piping 6 - Relays

Class 7	Caveat	2 - Valve body not of cast iron 3 - Valve yoke not of cast iron for piston-operated valves and spring-operated pressure relief valves 4 - Mounted on one-inch diameter pipe line or greater 5 - Valve operator cantilever length for air-operated diaphragm valves, spring-operated pressure relief valves, and light-weight piston-operated valves 6 - Valve operator cantilever length for substantial piston-operated valves 7 - Actuator and yoke not independently braced
Class 8A	Caveat	2 - Valve body not of cast iron 3 - Valve yoke not of cast iron 4 - Mounted on one-inch diameter pipe line or greater 5 - Valve operator cantilever length for motor-operated valves 6 - Actuator and yoke not independently braced
Class 8B	Caveat	2 - Valve body not of cast iron 3 - Valve yoke not of cast iron 4 - Valve operator cantilever length 5 - Actuator and yoke not independently braced
Class 9	Caveat	4 - No possibility of excessive duct distortion causing binding or misalignment of fan
Class 10	Caveat	3 - Doors secured 4 - No possibility of excessive duct distortion causing binding or misalignment of internal fan 8 - Relays
Class 11	Caveat	2 - No reliance on weak-way bending of steel plate or structural steel shapes 5 - Relays
Class 12	Caveat	5 - Relays
Class 13	Caveat	6 - Relays
Class 14	Caveat	2 - Contains only circuit breakers and switches 3 - Doors secured
Class 16	Caveat	4 - No reliance on weak-way bending of steel plate or structural steel shapes 6 - Doors secured

Class 17	Caveat	6 - Relays
Class 18	Caveat	2 - Evaluate computers and programmable controllers separately 5 - Natural frequency relative to 8 Hz limit considered
Class 20	Caveat	2 - Evaluate computers and programmable controllers separately 3 - Evaluate strip chart recorders separately 7 - Doors secured

FPC SUPPLEMENTAL RESPONSE:

FPC states that all GIP caveats were considered by the walkdown team. This is demonstrated by the team having identified outliers based on prescreened GIP caveats that were not included with the PSP SEWS. To further justify this position, FPC initiated a confirmatory walkdown. This walkdown was done by a SRT that included members from the original walkdown team and an independent team member. Mr. Walter Djordjevic of Stevenson & Associates was contracted as an independent review member to walk down a sample list of equipment. The walkdown consisted of a sample (approximately 10%) of equipment on the SSEL. The sample was based on a selection of at least one sample from all the twenty (20) equipment classes, except the tanks. The tanks were excluded from the sampling as the GIP and PSP SEWS are the same. This sample walkdown was done using the GIP SEWS that contain all the GIP caveats. This effort was designed to be independent of any existing SEWS based on the PSP. After the walkdown, the SRT compared the conclusions of the FPC PSP SEWS and the GIP SEWS. The specific results of this review are shown in Table 1 of the report from Stevenson and Associates. This letter is included in Attachment A of this submittal. FPC has shown that the differences between the PSP and GIP caveats are acceptable and do not adversely affect any of the conclusion of our program.

NRC RAI REQUEST NUMBER 12

In Reference 5, the Staff identified the need for adherence to the GIP for anchorage evaluation which is a critical item in equipment seismic adequacy verification. Based on information provided in Section 5.1.3 on Page 36, it is not clear whether anchorage verification was adequately performed. Statements such as "where practical, anchor bolts were tightness tested by hand to assure that they did not freely spin in place" do not provide an assurance of "wrench tightness" discussed in the GIP and endorsed by the PSP (Reference 2). Please provide documentation to demonstrate that equipment anchorage was evaluated per Section 4.4, Appendix C and GIP's equipment-specific anchorage caveats.

FPC SUPPLEMENTAL RESPONSE:

FPC acknowledges there are three important attributes to verify adequate anchorage: verifying actual anchorage is installed, verifying proper installation of the anchorage, and verifying there is adequate capacity of the anchorage.

Verifying Anchorage Installation Exists:

The primary action to verify the existence of anchorage has been satisfied. FPC performed a 100% inspection of accessible anchorage and hands-on check of all non-energized equipment and energized equipment with external anchorage. There is a specific caveat on the PSP SEWS to verify the existence of anchorage. This has been documented on all applicable SEWS (the exception is line mounted equipment). Where the anchorage was missing, or considered poor, then that equipment was declared an outlier. Out of the one-hundred-thirteen (113) outliers, approximately twenty-seven (27) are because of missing or poor anchorage. At the conclusion of the outlier resolution effort, there will be no unanchored SSEL equipment. The PSP also required the Seismic Review Team (SRT) to verify anchorage load path.

In addition to the USI A-46 effort, there has been many inspections and other programs at FPC that help verify the existence, or other concerns with anchorage. The Structural Maintenance Rule Inspections made hands on inspections of virtually every accessible anchorage in the plant. The System Readiness Review Plan performed walkdowns of plant equipment.

Verifying Proper Anchorage Installations:

The second area regarding proper installation has also been satisfied. All anchor bolts were hand checked and visually inspected where accessible during the A-46 walkdowns. Again, any concerns noted were required to be documented on the SEWS. In addition to the A-46 walkdowns, the Structural Maintenance Rule Inspection performed a visual inspection of anchorage in the plant (including non-SSEL and SSEL

equipment). The Maintenance Rule walkdowns also included a wrench tightness test that was performed for one-hundred-ninety-three (193) expansion anchors using methods based on the GIP. The one-hundred-ninety-three (193) expansion anchors tested were a subset of the three-hundred-fifty-four (354) expansion bolts included in the scope of the Maintenance Rule. A follow up analysis concluded the loose bolts did not adversely affect the adequacy of the equipment. This information is contained in the Structural Maintenance Rule Inspection Report.

Verifying Anchorage Capacity:

The third area deals with the capacity of the anchorage. The program at FPC relied on the judgment and experience of well trained Seismic Capability Engineers to make the determination if the capacity of the anchorage is adequate. FPC understands the Staff's concern about making an engineering judgment about the adequacy of an anchorage capacity. To address this issue, FPC has performed a bounding anchorage calculation based on the requirements of the GIP.

This bounding calculation took a subset of the electrical equipment contained in the SSEL and performs a bounding calculation. The intent of this bounding calculation is to envelope the equipment at CR-3 and to ensure equipment anchorage adequacy. These calculations are done to the requirements of the GIP. FPC maintains that mechanical equipment is inherently more rugged and generically better anchored. Therefore, no further review of mechanical equipment is warranted. This study included the following equipment classes:

Equipment Class 1	Motor Control Centers
Equipment Class 2	Low Voltage Switchgear
Equipment Class 3	Medium Voltage Switchgear
Equipment Class 4	Transformers
Equipment Class 14	Distribution Panels
Equipment Class 16	Battery Chargers and Inverters
Equipment Class 20	Instrument and Control panels and cabinets

A summary of the results of the calculation is included in Attachment A of this submittal. Backup calculations to this study are also included in Attachment A (FPC Calculation S97-0541).

The NRC has noted several items of equipment that they felt needed further review. These items are "noted" in Attachment A. The specific items of equipment and the findings of the FPC review are documented in Attachment A of this enclosure. Other than the item discussed next, all equipment anchorage were found to be acceptable.

In addition, the NRC has identified an issue with an electrical enclosure that was anchored through the base sheet metal. Specifically, this is the SCR Cabinet for

AHHE-4A and AHHE-4B (tag number AHCP-4). To address this specific concern, FPC has generated a Precursor Card to document the new anchorage outlier. FPC also has generated an "extent-of-condition" review to verify there are no other cabinets with this concern. The "extent-of-condition" review found no additional items (see Attachment A of this enclosure for more information).

As part of our confirmatory self-assessment, FPC will also perform additional anchorage calculations for approximately one hundred (100) electrical components. This is approximately 50% of the total scope of SSEL electrical components. Based on the results of the inspection, FPC may expand the scope of the assessment utilizing statistical methods.

NRC RAI REQUEST NUMBER 14b

The following requests pertain to the equipment outlier list provided in Table 5-4 of the report:

- b) For unanchored cabinets (e.g., SEQ 652-659), the resolution plan was to address "overturning/sliding potential." The potential for rattling is not necessarily eliminated by addressing the "overturning/sliding potential." Please provide information to demonstrate how the equipment performance will be assured without eliminating the potential for cabinet rattling.

FPC SUPPLEMENTAL RESPONSE:

FPC agrees that equipment performance cannot be assured without the elimination of cabinet rattling. FPC has declared several pieces of SSEL equipment as outliers because of this issue. This information is documented on the SEWS. Out of the one hundred thirteen outliers, approximately twenty-seven are due to anchorage.

The outliers have been classified as either restart outliers, or post-restart outliers. FPC will have completed the resolution of all restart outliers prior to restart from the current outage. The remaining outliers dealing with this issue will be resolved prior to restart from Refuel 11. In the interim, FPC will perform an operability evaluation to confirm that CR-3 can be safely shutdown following a seismic event using only seismically verified equipment to show the post-restart outliers are acceptable in the interim (Enclosure 5 3F1297-24-03).

In addition, upon completion of the outlier resolution, there will be no adjacent cabinets that are not bolted, or otherwise attached together, and there will be no unanchored SSEL equipment.

NRC RAI REQUEST NUMBER 14c

The following requests pertain to the equipment outlier list provided in Table 5-4 of the report:

- c) No resolution plan was provided for poor rack construction (SEQ 198 and 202). Please describe how this issue was resolved to assure equipment functionality.

FPC SUPPLEMENTAL RESPONSE:

The above two Sequence Numbers (198 and 202) refer to the two safety related station batteries DPBA-1A and DPBA-1B, respectively. These are the battery racks in the Control Complex. These racks have been declared outliers due to their poor construction. To address this, FPC has initiated a modification (MAR 97-08-10-01) to modify the racks.

The design work for this modification is complete. The field modification is scheduled for completion by end of the current outage. Once the modification is complete, the outliers associated with these two tags will be resolved.

NRC RAI REQUEST NUMBER 16

Regarding cable and conduit raceways, the staff had previously rejected your reasons for not adhering to the GIP on the basis that they are qualitative (References 1 and 5). Therefore, the staff is requesting additional information that (1) identifies the cable and conduit raceways examined by the seismic capability engineers (SCEs) during its plant-specific walkdown, and (2) summarizes the results of the assessment and the basis for the conclusions reached by the SCEs in verifying cable and conduit raceway seismic adequacy.

The requested information should also detail the criteria and methodology mentioned in the letter from P. Beard (FPC) to NRC Document Control Desk (on Generic Letter 97-02), dated August 27, 1993.

The need for the walkdown review of the cable and conduit raceway systems is evidenced by the identification of potential weak links by the Third Party Review. For example, the beam clamps identified in the Third Party Review are the types of plant-specific details that need to be verified. This reinforces the need for an A-46 review of the seismic adequacy of the cable and conduit systems by the SCEs. For the beam clamps, please provide documentation (loading, capacity, etc.) to demonstrate that they pass the GIP criteria for supports.

FPC SUPPLEMENTAL RESPONSE:

The evaluation of Cable and Conduit raceways was discussed during the NRC Audit. The walkdowns by the Staff indicated agreement that the CR-3 raceways are a rugged design. In addition, sample design basis calculations were provided to the NRC. FPC has received feedback from the NRC that indicates there are no open issues with FPC raceways.

However, FPC can provide additional justification. FPC management voluntarily initiated a structural extent-of-condition study, based on the IPEEE seismic margins program, to verify adequacy of plant structures. This seismic margin type study included an expansion of scope to address electrical raceways. This involved a more detailed review of electrical raceways than is typically performed in a seismic margins program. FPC has performed two Limited Analytical Reviews (LAR) for raceways using the GIP method. One LAR on a cable tray was performed to address the Thermo-Lag issue. These calculations showed positive results and further evaluated the acceptability of FPC's raceways. These LARs are included as part of FPC Calculation S97-0542. This calculation is included as Attachment D of this submittal.

Oversight of this effort was performed by Dr. Robert Kennedy. Dr. Kennedy concluded that CR-3 electrical raceways should not require further review, especially if some LARs (mentioned above) are performed as a part of a seismic margin study.

The question above also mentions the Staff's concern on beam clamps. This item was reviewed by the Staff during the Audit. FPC understands this issue was found to be acceptable with no further information required.

FPC has confirmed to the Staff during the Audit and associated walkdowns that CR-3 raceways are of rugged construction. This was verified by the various walkdowns and observations.

ARC RAI REQUEST NUMBER 18g

The following requests pertain to the screening verification data sheets included in Appendix C to the report:

- g) For cabinets RCPM-3A and 3B, it was stated on Page 43 in Appendix C that their anchorage and interaction verifications are not applicable. It is understood that the inspection of these cabinets have been deferred (see page 55 of the report, Table 5-5, SEQ Nos. 533 and 534) and it is expected that the anchorage and interaction verifications will be done at a future outage. Therefore, please justify why the table in Appendix C shows that the anchorage and interaction verifications of these Class 20 equipment items are not applicable even though the PSP requires such verifications.

FPC SUPPLEMENTAL RESPONSE:

When the walkdown report was issued in December 1995, FPC had not completed the walkdowns and evaluations of these thirty-five (35) inaccessible components identified in Table 5-5 of Appendix C (Reference 1). Since then, FPC has completed its walkdowns including RCPM-3A and RCPM-3B. The results of the review indicated that the above components have acceptable anchorage and interaction reviews.

A copy of the PSP SEWS for these two components is included in Attachment E.

NRC RAI REQUEST NUMBER 20b

The following requests pertain to Section 2.2, In-Structure Response Spectrum (Page 7):

It is not clear how the FRS presented in the seismic evaluation report were developed. Please provide a discussion which includes deviations, if any, from the staff safety evaluation on the subject, dated December 16, 1993. Please provide detailed information of the spectra including damping values, the input ground motion used and the structural model as well as the final results that are used for the plant. In particular, please provide a detailed description of the development of the FRS for the interior of the Reactor Building at the 160-foot elevation which is shown in the Figure 2-3, page 11.

FPC SUPPLEMENTAL RESPONSE:

FPC's understanding is that our previous response concerning floor response spectra (Reference 5) is acceptable.

However, the previous response to this RAI and other submittal on this subject, failed to document an exception to the Housner spectra. The information that follows was shared with the Staff during the Audit.

FPC's response to Generic Letter 87-02, Supplement 1, provided the requested information for the floor response spectra (FRS). The required information was sent to the NRC via two submittals. The first submittal was FPC letter 3F0493-09, dated April 16, 1993. The second submittal was FPC letter 3F1093-04, dated October 6, 1993. These two letters contained floor response spectra for the Auxiliary Building, Control Building, and Reactor Building. This spectra was based on the site specific ground response spectra.

During a recent review, FPC discovered an oversight on the part of FPC Engineering to not verify the licensing basis for EFT-2. In resolving an A-46 outlier associated with Emergency Feedwater Tank (EFT-2) and performing a review of the A-46 documentation in preparation for the NRC audit, an omission was found in FPC submittal to the NRC. In various submittal to the NRC concerning USI A-46, FPC stated that the site specific ground response spectra was to be used for the CR-3 A-46 program. It was later discovered that the emergency feedwater tank building was analyzed to Regulatory Guide 1.60, "Design Response Spectra for Seismic Design of Nuclear Power Plants," ground response spectra. This is the current CR-3 FSAR commitment for this building. This tank was built later in the life of CR-3 and used the Regulatory Guide 1.60 design response spectra. This spectra is more conservative than the FPC site specific ground response spectra.

A review of the CR-3 FSAR shows that only the Emergency Feedwater Tank Building (and building contents - including the tank) is designed to Regulatory Guide 1.60. All other structures and components in the plant are designed to the site specific ground response

spectra. The Emergency Feedwater Tank (EFT-2) is the only item of equipment in the SSEL that was designed to Reg. Guide 1.60. Therefore, FPC has concluded that there is no extent of condition concern with this item.

This exception does not invalidate any work done to date for the CR-3 A-46 program. The seismic adequacy of the tank has been verified using Reg. Guide 1.60 design response spectra. Attachment B of this submittal includes the latest calculation for seismic adequacy of the tank.

NRC RAI REQUEST NUMBER 23

The report states that no significant or programmatic deviations from the PSP were made (Page 64). Please provide a clear explanation of what "no significant deviation" means. Please itemize those evaluations/methodologies in PSP which you did not follow or from which you deviated. You should discuss what the deviations are and why they are justified. A definition including the use of examples as to what is considered significant should be provided.

FPC SUPPLEMENTAL RESPONSE:

The original response to this RAI stated that minor programmatic deviations were discovered in that a few anchorage calculations were not performed for tanks and heat exchangers, although their anchorage had been judged adequate. FPC committed to perform these anchorage calculations for tanks and heat exchangers to confirm anchorage adequacy. The calculation for these tanks and heat exchangers is complete with the exception of CDT-1. The calculations are included as Revision 1 to Calculation S96-0013. This calculation is included in Attachment C of this submittal.

The exception to this comment is the Condensate Storage Tank (CDT-1). This tank has recently been identified as an outlier. This issue was discussed with the NRC during the audit. CDT-1 is included in the group of post-restart outliers. For an operability assessment, FPC has performed a seismic margins calculation. This calculation is contained in Attachment D of this submittal.

ENCLOSURE 3

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

**RESTART OUTLIER RESOLUTION
SCHEDULE AND STATUS**

CRYSTAL RIVER UNIT 3

USI A-46 RESTART OUTLIER RESOLUTION SCHEDULE AND STATUS

UNRESOLVED SAFETY ISSUE (USI) A-46, GENERIC LETTER 87-02

By letter dated August 1, 1997 (3F0897-01), FPC committed to resolve seventy (70) outliers which were part of our Level I and Level II systems (safety-related), as defined by the System Readiness Review Plan, prior to startup from the current outage.

This enclosure provides the restart outlier resolution schedule and status. This schedule indicates that, to date, sixty (60) restart outliers are resolved, leaving a balance of ten (10) to be resolved prior to restart.

Restart Outlier Resolution Status

Tag Number	Description	Disposition Status	Disposition Document
AHF-17A	CONTROL COMPLEX NORMAL SUPPLY FAN A	Engineering - 100%, Field Work Pending	PEERE 1512 (NU0345652)
AHF-17B	CONTROL COMPLEX NORMAL SUPPLY FAN B	Engineering - 100%, Field Work Pending	PEERE 1512 (NU0345652)
DPBA-1A	250/125V BATTERY A	Engineering - 100%, Field Work Pending	MAR 97-08-10-01 (NU0349457) and Calc. S97-0330
DPBA-1B	250/125V BATTERY B	Engineering - 100%, Field Work Pending	MAR 97-08-10-01 (NU0349458) and Calc. S97-0330
MTSW-2C	4160V ES 3A (NORTH)	Engineering - 100%, Field Work Pending	MAR 97-08-10-01 (NU0349261) and Calc. S97-0330
MTSW-2F	4160V ES 3B (SOUTH)	Engineering - 100%, Field Work Pending	NU0344313 (inspect) NU0349156 (Mod)
VBXS-1B	VITAL BUS TRANSFER SWITCH B	Engineering - 100%, Field Work Pending	NU0344786 (to be scheduled)
VBXS-1D	VITAL BUS TRANSFER SWITCH D	Engineering - 100%, Field Work Pending	NU0344788 (to be scheduled)
VBXS-3B	EFIC VITAL BUS TRANSFER SWITCH B	Engineering - 100%, Field Work Pending	NU0344789 (to be scheduled)
VBXS-3D	EFIC VITAL BUS TRANSFER SWITCH D	Engineering - 100%, Field Work Pending	NU0344790 (to be scheduled)
ACDP-68-T	ES DISTRIBUTION PANEL 3AB TRANSFORMER	100%	Reinspection, Engineering Evaluation
AH-196-POS1	AHD-1 CONTROL	100%	MAR 97-08-05-02 removes equip.
AH-196-POS2	AHD-2 CONTROL	100%	MAR 97-08-05-02 removes equip.
AH-196-POS3	AHD-3 CONTROL	100%	TT NU 0349305
AH-967-SV	AHD-1 & AHD-1D CONTROL	100%	Engineering Evaluation
AHD-01D	CONTROL COMPLEX MAKE-UP AIR	100%	Engineering Evaluation
ATCP-1	ANTICIPATED TRANSIENT WITHOUT SCRAM LOGIC CABINET	100%	TT NU0344792 (completed)
CAP-1B	BORIC ACID PUMP B	100%	TT NU0344793 (completed)
CEILING	CONTROL ROOM CEILING	100%	MAR 97-03-04-01
DCP-1B	DECAY HEAT CLOSED CYCLE COOLING PUMP B	100%	PC 97-0048

Restart Outlier Resolution Status

Tag Number	Description	Disposition Status	Disposition Document
DFT-3A	DIESEL GENERATOR FUEL OIL DAY TANK A	100%	MAR 97-08-10-01 (NU0349265) and Calc. S97-0330
DFT-3B	DIESEL GENERATOR FUEL OIL DAY TANK B	100%	MAR 97-08-10-01 (NU0349265) and Calc. S97-0330
DHT-1	BORATED WATER STORAGE TANK	100%	Revised Calc. S94-0011
DRRD-2-1	CRD DC BREAKER CABINET UNIT 1 & 2	100%	NU0344316 (inspect), Engineering Evaluation to close outlier
DRRD-2-2	CRD DC BREAKER CABINET UNIT 3 & 4	100%	NU0344316 (inspect), Engineering Evaluation to close outlier
DRRD-2-3	CRD DC BREAKER CABINET TRIP RESET	100%	NU0344316 (inspect), Engineering Evaluation to close outlier
EFT-2	EMERGENCY FEEDWATER TANK	100%	Calculation S97-0316
EGCP-2A	EMERGENCY DIESEL GEN A ELECTRICAL EQUIPMENT CABINET	100%	MAR 97-08-10-01 (NU0349322) and Calc. S97-0330
EGCP-2B	EMERGENCY DIESEL GEN B ELECTRICAL EQUIPMENT CABINET	100%	MAR 97-08-10-01 (NU0349322) and Calc. S97-0330
EGDG-1B	DIESEL GENERATOR B	100%	MAR 97-08-10-01 (NU0349519) and Calc. S97-0330
ESCP-4A	ENGINEERED SAFEGUARDS ACTUATION RELAY CABINET 4A	100%	Verbal agreement with Ops.
ESCP-4B	ENGINEERED SAFEGUARDS ACTUATION RELAY CABINET 4B	100%	Verbal agreement with Ops.
ESCP-4C	ENGINEERED SAFEGUARDS ACTUATION RELAY CABINET 4C	100%	Verbal agreement with Ops.
ESCP-4D	ENGINEERED SAFEGUARDS ACTUATION RELAY CABINET 4D	100%	Verbal agreement with Ops.
ESCP-5A	ENGINEERED SAFEGUARDS ACTUATION RELAY CABINET 5A	100%	NU 0342044 (completed)
IAP-1A	INSTRUMENT AIR COMPRESSOR A	100%	Engineering Evaluation
MSV-411	MAIN STEAM LINE A-2 ISOLATION VALVE	100%	Engineering Evaluation
MTSW-2E	4160VES 3B (NORTH)	100%	NU0344313, Reinspected
MTSW-3F	480V ES BUS 3A	100%	MAR 97-08-10-01 (NU0349326) and Calc. S97-0330
MTSW-3F-T	4160/480V ES BUS 3A TRANSFORMER	100%	Engineering Evaluation

Restart Outlier Resolution Status

Tag Number	Description	Disposition Status	Disposition Document
MTSW-3G	480V ES BUS 3B	100%	MAR 97-08-10-01 (NU0349328) and Calc. S97-0330
MTSW-3G-T	4160/480V ES BUS 3B TRANSFORMER	100%	Engineering Evaluation
MUP-1A	MAKE-UP AND PURIFICATION PUMP 3A	100%	TT NU0344791 (completed)
MUV-051	LET-DOWN FLOW CONTROL VALVE	100%	Further Engineering Evaluation
MUV-200	LETDOWN ISOLATION VALVE TO DEMINERALIZER MULM-1A	100%	MAR 97-08-10-01 (NU0349520) and Calc. S97-0330
MUXS-1	4160V ISOLATION SWITCH	100%	NU0344312
NI&P-D2	NI&P SYSTEM SUBASSEMBLY D CABINET 2	100%	Verbal agreement with Ops.
NI-1-A3	PROPORTIONAL COUNTER ASSEMBLY	100%	n/a
NI-2-B3	PROPORTIONAL COUNTER ASSEMBLY	100%	n/a
NI-3-C3	COMPENSATED ION CHAMBER ASSEMBLY	100%	n/a
NI-4-D3	COMPENSATED ION CHAMBER ASSEMBLY	100%	n/a
RCV-10	PRESSURIZER POWER OPERATED RELIEF VALVE	100%	M92-0063
RCV-1a	PRESSURIZER BLOCK VALVE	100%	M92-0063
RR2B	ENGINEERED SAFEGUARD AUXILIARY RELAY RACK RR2B	100%	TT NU0344784
RSA	REMOTE SHUTDOWN RELAY CABINET A	100%	NU0345191 (completed)
RSA-1	REMOTE SHUTDOWN RELAY CABINET A-1	100%	Engineering Evaluation
RWP-2A	NUCLEAR SERVICES SEA WATER PUMP 3A	100%	Calc. S70-0001
RWP-2B	NUCLEAR SERVICES SEA WATER PUMP 3B	100%	Calc. S70-0001
RWP-3A	DECAY HEAT SERVICE SEA WATER PUMP 3A	100%	Calc. S70-0001
RWP-3B	DECAY HEAT SERVICE SEA WATER PUMP 3B	100%	Calc. S70-0001

Restart Outlier Resolution Status

Tag Number	Description	Disposition Status	Disposition Document
SWP-1A	EMERGENCY NUCLEAR SERVICE SEA WATER PUMP 3A	100%	NU0344310 (inspect - completed)
SWP-1B	EMERGENCY NUCLEAR SERVICE CCC PUMP 3B	100%	NU0344796 (inspect) & NU0349157 (completed mod.)
SWP-1C	NORMAL NUCLEAR SERVICE CLOSED CYCLE COOLING PUMP	100%	NU0344311 (inspect - completed) & M76-0003
SWV-354-SV1	SWV-354 CONTROL	100%	TT NU0349158
SWV-354-SV2	SWV-354 CONTROL	100%	TT NU0349158
VBIT-1A	DUAL INPUT INVERTER 3A	100%	MAR 93-05-07-03
VBXS-1C	VITAL BUS TRANSFER SWITCH C	100%	NU0344787 (completed)
WDT-1A	WASTE GAS DECAY TANK 1A	100%	Closed based on inspection of photographs
WDT-1B	WASTE GAS DECAY TANK 1B	100%	Closed based on inspection of photographs
WDT-1C	WASTE GAS DECAY TANK 1C	100%	Closed based on inspection of photographs

ENCLOSURE 4

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

**POST-RESTART OUTLIER RESOLUTION
SCHEDULE AND STATUS**

CRYSTAL RIVER UNIT 3

USI A-46 POST-RESTART OUTLIER RESOLUTION SCHEDULE AND STATUS

UNRESOLVED SAFETY ISSUE (USI) A-46, GENERIC LETTER 87-02

By letter dated August 1, 1997 (3F0897-01), FPC committed to develop a work-off curve for completion of post-restart outliers prior to restart from the current extended outage. Forty-three (43) outliers in Level II and Level III systems (non-safety related) are being resolved prior to startup from Refueling Outage 11.

This enclosure provides the post-restart outlier resolution schedule and status. To date, seventeen (17) of forty-three (43) post-restart outliers are resolved, leaving a balance of twenty six (26) to be resolved. This schedule indicates resolution of the last outlier to be by the end of January 1999.

These post-restart outliers are receiving an operability review prior to restart from the current outage to confirm that safe shutdown is still achievable using other safety related equipment.

Restart Outlier Resolution Status

Tag Number	Description	Estimated Field	Disposition Status	Disposition Document
AHCP-4	SCR CABINET FOR AHHE-4A/4B	6/15/98	0%	CGWR to be developed
DPBA-1C	250/125V BATTERY C	8/15/98	0%	CGWR to be developed
ER1	EVENTS RECORDER CABINET 1	9/15/98	0%	CGWR to be developed
ER2	EVENTS RECORDER CABINET 2	9/15/98	0%	CGWR to be developed
ER3	EVENTS RECORDER CABINET 3	9/15/98	0%	CGWR to be developed
ER4	EVENTS RECORDER CABINET 4	9/15/98	0%	CGWR to be developed
ER5	EVENTS RECORDER CABINET 5	9/15/98	0%	CGWR to be developed
ER6	EVENTS RECORDER CABINET 6	9/15/98	0%	CGWR to be developed
ER7	EVENTS RECORDER CABINET 7	9/15/98	0%	CGWR to be developed
ER8	EVENTS RECORDER CABINET 8	9/15/98	0%	CGWR to be developed
ICS-5	INTEGRATED CONTROL SYSTEM CABINET 5	10/1/98	0%	CGWR to be developed
NGT-XX	ADV BACKUP NITROGEN SUPPLY TANKS (10)	10/1/98	0%	CGWR to be developed
NNI-5	AUXILIARY CONTROL SYSTEM CABINET 5	10/15/98	0%	CGWR to be developed
NNI-6	AUXILIARY CONTROL SYSTEM CABINET 6	10/15/98	0%	CGWR to be developed
MTMC-09	480V PRESSURIZER HEATER MCC 3B	11/15/98	0%	CGWR to be developed
MTSW-3D	480V REACTOR AUXILIARY BUS B	11/15/98	0%	CGWR to be developed
TPC	TRANSMITTER POWER SUPPLY CABINETS A & B	11/15/98	0%	CGWR to be developed
MTMC-12	480V TURBINE MCC 3A	12/15/98	0%	CGWR to be developed

Restart Outlier Resolution Status

Tag Number	Description	Estimated Field	Disposition Status	Disposition Document
MTSW-3A	480V TURBINE AUXILIARY BUS A	12/15/98	0%	CGWR to be developed
MTSW-3C	480V REACTOR AUXILIARY BUS A	12/15/98	0%	CGWR to be developed
MTSW-3J	480V PLANT AUXILIARY BUS	12/15/98	0%	CGWR to be developed
MTSW-3J-T	4160/480V PLANT AUXILIARY BUS TRANSFORMER	1/15/99	0%	CGWR to be developed
PORV/TEMP	PORV & TEMPERATURE SATURATION CABINET	1/15/99	0%	CGWR to be developed
RFL MPLXR	RFL MULTIPLEXER FOR 500 KV SWITCHYARD	1/15/99	0%	CGWR to be developed
CDT-1	CONDENSATE STORAGE TANK	n/a	0%	Calculation to be developed
SF-9-FIT	SPENT FUEL COOLANT FLOW TRANSMITTER	n/a	0%	Engineering Evaluation
AHP-01A	CONTROL COMPLEX HVAC AIR COMPRESSOR A	n/a	100%	Qualified by reinspection of plant drawings
AHP-01B	CONTROL COMPLEX HVAC AIR COMPRESSOR B	n/a	100%	Qualified by reinspection of plant drawings
AHP-01C	CONTROL COMPLEX HVAC AIR COMPRESSOR C	n/a	100%	Qualified by reinspection of plant drawings
AHP-01D	CONTROL COMPLEX HVAC AIR COMPRESSOR D	n/a	100%	Qualified by reinspection of plant drawings
CDHE-4A	MAIN CONDENSER A	n/a	100%	Calculation S96-0013, Rev. 1
CDHE-4B	MAIN CONDENSER B	n/a	100%	Calculation S96-0013, Rev. 1
DPBC-1G	BATTERY CHARGER G	n/a	100%	Qualified by reinspection of plant drawings and Engineering Evaluation
DPBC-1H	BATTERY CHARGER H	n/a	100%	Qualified by reinspection of plant drawings and Engineering Evaluation
DPBC-1I	BATTERY CHARGER I	n/a	100%	Qualified by reinspection of plant drawings and Engineering Evaluation
DPDP-1C	250/125V DC MAIN PANEL 3C	n/a	100%	Qualified by reinspection of plant drawings and Engineering Evaluation

Restart Outlier Resolution Status

Tag Number	Description	Estimated Field	Disposition Status	Disposition Document
DPDS-1C	BATTERY 3C DISCONNECT SWITCH	n/a	100%	Qualified by reinspection of plant drawings and Engineering Evaluation
DPXS-1C	DPBC-1 INPUT POWER TRANSFER SWITCH	n/a	100%	Qualified by reinspection of plant drawings and Engineering Evaluation
RWP-1	NORMAL NUCLEAR SERVICES SEA WATER PUMP MOTOR COOLER	n/a	100%	Calculation S70-0001, Rev. 0
WDT-3A	RC BLEED TANK 3A	n/a	100%	Calculation S96-0013, Rev. 1
WDT-3B	RC BLEED TANK 3B	n/a	100%	Calculation S96-0013, Rev. 1
WDT-3C	RC BLEED TANK 3C	n/a	100%	Calculation S96-0013, Rev. 1
WDT-5	REACTOR COOLANT DRAIN TANK	n/a	100%	Calculation S96-0013, Rev. 1

ENCLOSURE 5

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

LIST OF REGULATORY COMMITMENTS

List of Regulatory Commitments

The following table identifies those actions committed to by Florida Power Corporation in this document. Any other actions discussed in the submittal represent intended or planned actions by Florida Power Corporation. They are described for the NRC's information and are not regulatory commitments. Please notify the Manager, Nuclear Licensing, of any questions regarding this document or any associated regulatory commitments.

ID NUMBER	COMMITMENT	DATE DUE
3F1297-24-01	As part of closure of our program, a confirmatory self-assessment will be conducted. FPC will inform the NRC about the results of the audit concerning all open issues regarding USI A-46 for CR-3. Review to include: audit of SSEL, resolution of all outliers, and review of anchorage calculation.	Prior to startup from Refueling Outage 11
3F1297-24-02 (Ref. 3F1297-33-2)	FPC has improved upon the schedule and will be completing resolution of all outliers prior to startup from Refueling Outage 11. FPC will provide confirmation of completion of resolution of all outliers.	Prior to startup from Refueling Outage 11
3F1297-24-03	The remaining twenty-six (26) post-restart outliers will receive an operability assessment prior to restart from the current outage to confirm that the failure of any of the outstanding non-safety related outliers will not affect the ability to achieve safe shutdown of the plant. The assessment will also include a review of any seismic interaction concerns.	Prior to restart from current outage
3F1297-24-04	Revise Abnormal Procedure AP-961, Earthquake, to include identification of the bad actor relays and guidance for operators to cope with relay chatter subsequent to a seismic event.	By Mode 2
3F1297-24-05	FPC will perform GIP anchorage calculations for approximately 50% (100) of electrical components currently identified on the SSEL. FPC may expand the scope of the calculations utilizing statistical methods.	Prior to startup from Refueling Outage 11
3F1297-24-06	FPC will revise the PSP to incorporate comments on relay review.	Prior to startup from Refueling Outage 11
3F1297-24-07	At the conclusion of the outlier resolution effort, there will be no unanchored SSEL equipment.	Prior to startup from Refueling Outage 11
3F1297-24-08	FPC will have completed the resolution of all restart outliers prior to restart from the current outage.	By Mode 2
3F1297-24-09	At the completion of outlier resolution, there will be no SSEL related adjacent cabinets that are not bolted or otherwise attached together.	Prior to startup from Refueling Outage 11
3F1297-24-10	Submit AP-961 to NRC for information upon completion of revision (upon completion of Commitment 3F1297-24-04)	January 31, 1998