

**Florida
Power**
CORPORATION

November 25, 1988
3F1188-17

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
High Energy Line Breaks (HELB)
Status Update

References: 1. Florida Power Corporation letter dated September 27,
1988 (3F0988-16)
2. LER 88-016, dated October 6, 1988

Dear Sir:

This submittal is to provide an update on the status of the HELB resolution program underway at CR-3. In the referenced submittals, FPC provided information on our program to resolve the fact that safety-related modifications had been made to the plant without the effect of a HELB being explicitly considered in the design.

FPC acknowledges this to be a significant oversight in our design control program in that potential adverse interactions may have been overlooked. However, most such interactions have existed since the original pre-licensing review completed in association with the establishment of GAI Report #1811 and are therefore quite likely to have been properly dispositioned. We are unable to locate sufficient documentation to rely upon this as permanent resolution and are therefore reestablishing our demonstration of compliance with a more appropriate HELB design basis. The current criteria is quite onerous and not consistent with progress made in understanding pipe break phenomenon (e.g. as discussed in NUREG-1061, Report of the USNRC Piping Review Committee). FPC considers that continuation of GAI Report #1811 (refer to Attachment 1 for a summary of the relevant criteria) as the licensing basis for CR-3 will require extensive resources for evaluation, design and installation of hardware which are not prudent or warranted from either a safety or resource

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perspective. FPC has, therefore, chosen to generally upgrade in its licensing basis to more current criteria.

FPC anticipates proposing a HELB criteria which will utilize a combination of the existing basis and the Standard Review Plans 3.6.1 and 3.6.2 as modified by Generic Letter 87-11. This revision of the design criteria will be coupled with our intent to provide source shields to eliminate the jet effects of most of the breaks. Relocation or protection of targets will be accomplished in those areas where the break or crack is in areas with restricted access (due to congestion or high radiation). Future modifications can be evaluated based on established break and crack locations with mitigation equipment generally already in place. This approach will allow FPC to bring the HELB issue to a more permanent, hardware oriented resolution.

The revised design/licensing basis is not yet finalized; but, in general, will rely upon the SRP for evaluating the consequences of HELB's. The existing criteria may be retained for the high energy portion of the Decay Heat Removal System in the Auxiliary Building. The selection of high energy lines to be evaluated will rely on our existing licensing basis. Thus, the systems to be evaluated will be as follows: Main Steam, Main Feedwater, Auxiliary Steam, Emergency Feedwater, and Makeup & Purification.

FPC has identified potential targets as part of our earlier resolution strategy, but did not attempt to explicitly identify adverse interactions. FPC will detail an expanded basis for continued operation as part of the exemption; but is basically relying on a degree of confidence with the earlier work (GAI Report #1811 review), the low probability of pipe failures, and a degree of separation provided by Appendix R and other efforts. Further, many un-evaluated interactions would be resolved by target survivability or systems assessment without any real physical modifications. FPC had originally intended to utilize such interaction evaluations as our resolution strategy, but our current strategy is a more complete and effective approach. We will expand on the degree of separation afforded by various efforts and the actual stress state of analyzed terminal ends in our submittal.

FPC's schedule for continuing to address this issue is as follows:

- a. FPC will submit an exemption request pursuant to 10CFR50.12 for schedular relief from compliance with GDC-4, by December 16, 1988. This request will include a safety assessment supporting operation for the period of time for which relief is sought. A more detailed schedule with appropriate milestones, will be provided with the exemption request.

- b. FPC will prepare and submit a revised licensing/design basis in the first quarter of 1989. This will identify which lines are considered high energy and whether updated GAI Report #1811 or SRP criteria are utilized. It will also include postulated break locations, jet map drawings, tabulated jet pressures and temperatures as a function of distance from a break, and a general design criteria for evaluating targets, shields, and restraints. Permanent technical relief from GDC-4 may be sought if eliminating the need to postulate certain arbitrary terminal end breaks can be technically supported.
- c. FPC will begin design efforts associated with source shielding each break as soon as the design basis is finalized.
- d. FPC will begin installation upon completion of design. Most of this work is anticipated to be such that installation can proceed on-line.

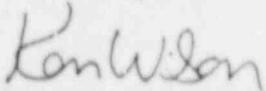
At this time, the installation schedule anticipated is many months. For lines which can only be accessed during shutdown for design input verification and installation, final installation could be as late as Refuel 8 (1991). However, completion of the new design/licensing basis will allow significant planning refinement which could improve such a schedule.

There has been concern expressed that environmental qualification of equipment could be significantly impacted by this HELB issue. This particular HELB issue revolves around the addition of safety-related equipment, not high energy lines. Therefore, the harsh environment caused by HELBs is unaffected. Equipment additions were required to be designed to appropriate environment, even though, other HELB effects were not clearly assessed. As we have reviewed the broader impact of HELB, we have uncovered some potential design concerns associated with EQ which are being actively pursued as a separate issue.

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We appreciate the open and frank communication we have had with the staff on this issue and solicit any further feedback that you believe warranted. We anticipate the need for a detailed meeting in December after we have finalized and submitted our exemption request.

Sincerely,



Ken Wilson, Manager
Nuclear Licensing

KRW:JWT:sdr

Attachment

xc: Regional Administrator, Region II
Senior Resident Inspector

Attachment 1 to 3F1188-17

As described in FSAR Section 5.4.4 on page 5-85, CR-3 piping licensing basis utilizes GAI Report #1811, Effects of High Energy Piping System Breaks Outside Reactor Building." Briefly the pipe break criteria described in that report is as follows:

GAI REPORT 1811 PIPE BREAK CRITERIA

PIPE CLASSIFICATIONS

EFFECTS CONSIDERED

- | | |
|---|---|
| a. Fluid above 200°F and 275 psig at terminal ends and high stress locations on lines 4 inches or greater | Longitudinal and circumferential breaks including pipe whip, jet impingement, pressurization, flooding, and environmental conditions. |
| b. Fluid above 200°F and 275 psig at terminal ends and high stress locations on lines 1 inch to 4 inches | Circumferential breaks including pipe whip, jet impingement, pressurization, flooding, and environmental conditions. |
| c. Fluid above 200°F and/or 275 psig at the most adverse locations for all pipes | Crack breaks including jet impingement, flooding, and environmental conditions. |
| d. Fluid below 200°F and 275 psig | None. |