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UNITED STATES NUCLEAR REGULATORY COMMISSION

DEC 31 1987 Hetlemes

MEMORANDUM RE: E. Jordan

FROM: D. Ross

SUBJECT: REVIEW OF GI 93, "STEAM BINDING OF AUXILIARY FEEDWATER PUMPS", AT CRGR MEETING #127, DECEMBER 23, 1987

Enclosure: Memo, Ernst to Ross, dated December 30, 1987

Revision 4 to the CRGR Charter (4-23-87), page 8, paragraph D, notes that: "It is the responsibility of each member to assure that the minutes accurately reflect his views."

Since I did not agree with the consensus of the CRGR, I request that this comment memorandum be included as part of the minutes of meeting #127.

GI-93 was reviewed by CRGR on December 23, 1987. Some of the AFW steam binding history is:

- The history of steam binding of AFW pumps dates back at least to 1983.
- Bulletin IE 85-01 was issued on 10-29-85, on this topic. (This bulletin was reviewed by CRGR at meeting #81).
- The IE 85-01 noted licensee actions as:
 - a) develop procedures for monitoring fluid conditions in AFW system
 - b) develop procedures for recognizing steam binding and restoring AFW system to "operable"
 - c) procedural controls remain in effect until completion of <u>hardware modification to substantially reduce</u> <u>the likelihood of steam binding</u> (emphasis added) or until GI 93 resolved.

The proposed resolution of GI 93 is a generic letter, which indefinitely extends items a and b above, in paragraph 3, but is silent on (c).

The generic letter notes that, for plants with a high back-leakage event rate, the monitoring system with control room alarms was instrumental in providing early warning and timely corrective action.

BB09160144 BB0111 PDR REVGP NRGCRGR MEETING127 PNU The GL concludes that the monitoring requirements of the bulletin must* be continued (indefinitely) to keep the risk low. If, the GL continues, malfunctioning of check valves occurs, the monitoring frequency must be increased. Again, it is silent on hardware modification.

The regulatory analysis (p. 7) notes the INPO SOER-86-3 (issued 10-15-86) on this topic. Among other things, the follow-up to this industry-sponsored SOER tasked utilities to implement appropriate changes in their check valve maintenance and the programs, and to identify the high risk check valves and include them or orgram (this requirement is more than in the proposed GL).

The regulatory and the status in his region. His response is provided in the enclosure. He provided details for Farley, McGuire, Catawba, and Shearon Harris. Check valve repairs, modifications, or replacements have been effected at these plants such that they probably are no longer B plants. Thus I believe they did what the IE-85-01 bulletin wanted done; the GL should do no less.

At McGuire, there was an installation error, and possibly poor design.

At Catawba** there was a pattern of almost continuous leakage through one or more interfacing check valves. At Diablo Canyon 2 there was a leak in a weld on an interfacing check valve disc; a weld repair apparently fixed this. The enclosure is a more up-to-date assessment of the B-plant status.

*"must" is used several times in the GL; it is not clear to me how something that "must" be done is assured sans a licensing commitment.

**This information that I extract from the regulatory analysis should be qualified to the extent that the analysis was dated February 87, and thus reflects the plant status as of about 1 year ago. The distressing factor in the Category B plants is that, as discussed in the regulatory analysis and noted in IEB 85-01 (para. 3, p 3) hardware modifications to substantially reduce the likelihood of steam binding are needed, re-ertheless the CL is silent on this topic. It seemingly tolerates a likelihood of leakage on the basis that it would be detected; this is to me a reduction in defense depth. (Indeed, on p. 17, of the regulatory analysis the two alternatives do not include a hardware modification as an option.)

I do not fault the risk analysis; it well may be correct. And, on p. 23, the analysis suggests a reduction in probability of leakage once the industry program on check valve reliability is implemented. Although the B plants have incorporated continual monitoring systems with control room alarm, there is no requirement to do so, either in IEB 85-01 or in the proposed GL.

Considering the safety function of the AFW, it does not seem prudent for the NRC to tolerate the category B plants and simply leave the repair, replacement, and proper maintenance to the option of the licensee. Fortunately, it appears that the back-leakages are fixed, now.

Perhaps 50.59(2) applies, regarding an unreviewed safety question and the "probability of occurence of an accident or malfunction of equipment important to wafety", or other portion of para (b). Perhaps it is GDC 34, on the subject of residual heat removal. Perhaps we could cite Section XVI, Corrective Actions, of App. B to Part 50. Although the regulations are not specific in providing a basis for requiring high reliability of components such as pumps or valves, there is no doubt that GDC 1* applies, thus establishing the general requirement for high reliability where the safety function of the components require it. More importantly, the basis of regulating by the NRC has been defense-in-depth that requires among other things that first you design and fabricate to high structural and functional standards and then assume failures not having known failures.

Whatever the regulatory basis citation, I believe that the resolution of this GI should have included as requirements:

 the spirit of para. 3 of JEB 85-01: "hardware modifications to substantially reduce the likelihood of steam binding" for category B plants, and

*It is relevant and interesting to note that in an NRR letter to Jordan (wrt CRGR) on the subject of a proposed bulletin on reactor trip breakers, NRR cites GDC-1 in its clause on requiring that "structures, systems, & components important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be r formed." If licensees are to assure compliance with this criterion for rea or trip breakers, then why not the AFW interfacing vavies? continuous monitoring alarms in control room for B plants, pending the completion of (1) above.

:r addition, I have some continuing concern about use of procedures alone
("touchee-feelee") for plants (even the A plants) that will operate perhaps
40-60 years more. At the least, AEOD should do another case study in about
3 years to see if there are any residual or new B plants.

Pag J. F. Ross

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Enclosure: As stated

cc: CRGR Members