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BWR OWNERS' GROUP

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DOCKETED USNRC
'92 APR 20 P1:44

BWROG-92032
April 10, 1992

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57FR6748
2/27/92
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Chief, Regulatory Publications Branch
US Nuclear Regulatory Commission
Washington, DC 20555

Subject: BWR OWNERS' GROUP COMMENTS ON NUREG-1449 "SHUTDOWN AND LOW-POWER OPERATION AT COMMERCIAL NUCLEAR POWER PLANTS IN THE UNITED STATES"

The BWR Owners' Group appreciates the opportunity to comment on draft NUREG-1449 "Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States". Our comments have been compiled by a joint BWR Owners' Group Outage Management Committee and Shutdown Issues Committee Working Group:

Executive Summary

Page XV: The statement that Mark I and II secondary containments offer little protection is based on conservative and, perhaps misleading assumptions (see later discussion applicable to Section 6.9.1). BWR secondary containments offer substantial processing capabilities when ventilation, heat transfer, and condensation effects are realistically considered.

Section 4

We feel that the NSAC documents may not be properly represented. Some of the information appears to be obsolete. Greater emphasis should be placed on the Grand Gulf and Surry results when available. Without these results, the conclusions may be incorrect and lead to inappropriate actions.

Page 4-7, Figure 4.1: The figure assumes core damage is equivalent to reaching 200°F. Figure and text should be revised to refer to boiling rather than core damage. For example, Figure 4.1 implies core damage frequency at Brunswick is the same as the probability of losing RHR.

Section 5

A statement should be added at the beginning of Section 5 to reference the particular BWR Standard Technical Specifications (STS) used in this section.

5.1.1.1, 2nd Paragraph: First sentence is incorrect. For example, current BWR-4 Standard Tech Specs (STS) require IRMs in mode 3, 4, and 5; APRMs in modes 3 and 5; SRMs in mode 5; Scram Discharge Volume level in mode 5; Reactor mode switch in modes 3, 4, and 5; and manual scram in modes 3, 4 and 5.

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The statement "all control rod movement is restricted to one control blade at a time, unless the associated fuel cell contains no fuel" is incorrect. Only one control rod can be moved at a time under any circumstances. See BWR-4 Standard Tech Specs Section 3.9.10 for additional information.

5.1.1.2, 2nd Paragraph: 2nd sentence is incorrect: It should be "This requirement is eliminated if the RPV head is removed, refueling cavity is flooded, spent fuel pool gates are removed, and the level is maintained as required by BWR-4 STS 3.9.8 and 3.9.9."

5.1.1.3, 2nd Paragraph: RHR requirement should be stated in terms of "loops" not "divisions". Statement is incorrect; see BWR-4 STS 3.4.9.1, 3.4.9.2, 3.9.11.1, and 3.9.11.2.

5.1.1.4, 2nd Paragraph: Per BWR-4 STS 3.6.6.4 containment atmosphere deinerting may be initiated 24 hours prior to being less than 15% rated thermal power. Inerting of the containment must be completed within 24 hours after exceeding 15% rated thermal power during startup.

5.1.1.4, 2nd Paragraph, 3rd Sentence: Start this sentence with the word "Primary", end the sentence with "cold shutdown and refuel modes". In general, throughout this document when discussing BWR containments, there is a need to differentiate between primary and secondary containments. The blanket statement that containment isolation instrumentation requirements are not applicable is incorrect per BWR-4 STS (see the Primary Containment Isolation System section). In addition, standby gas is required whenever secondary containment is required.

5.1.1.4, 2nd Paragraph, last Sentence: "during fuel movement" should also include core alterations and operations with the potential for draining the vessel (see BWR-4 STS 3.6.5.1).

5.1.2.4: While this is true, other occurences are reportable that do not involve Tech Specs. Many of the significant reporting requirements are applicable to events which may occur during shutdown (i.e., ESF actuations, missed surveillances, certain test failures, emergency plan entrance requirements).

5.1.2.6, 2nd Paragraph: Change "head" to "flange" and "pools" to "racks".

4th Paragraph: The intent of this statement is unclear. For BWRs, only BWR-6s have Fuel Handling Buildings. Believe that this refers to secondary containments.

Last paragraph: Change "within" to "less than". Reference to K effective seems inappropriate.

<u>Section 6</u>

Section 6, General Comment: It is difficult to distinguish the findings from the conclusions throughout this section.

6.2: We believe that implementation of NUMARC 91-06 will address the Outage Planning and Control issues addressed here. We recommend no regulatory action until the effectiveness of NUMARC 91-06 has been evaluated.

6.6.2, Page 6-12, 2nd Paragraph: The four sentences starting with "If the vessel head is detensioned ···" through "··· the preferred method of RHR is to flood the reactor cavity and place the fuel pool cooling system in operation." require clarification. For some BWRs, heat cannot be transferred to the suppression pool through the main steam lines with the head detensioned or removed.

In addition, the preferred alternate method may be reactor water cleanup not fuel pool cooling. The plant configuration and decay heat load are key parameters when identifying preferred alternate decay heat removal methods.

6.7: It appears that undue attention is focused on the use of freeze seals. The use of temporary mechanical modifications (e.g., nozzle dams, steam line plugs, inflatable bladders etc.) should also be evaluated for the need of a 10CFR50.59 review.

6.7, Top of Page 6-13: These two sentences are inconsistent with BWR-4 STS Section 3.5.2.

6.7.1.4, Paragraph 1: This is inconsistent with the conclusion in Section 6.7 at the top of page 6-13 (i.e., ECCS available).

6.9.1, Page 6-22, Beginning of Paragraph 4:.... "could increase the internal pressure to 0.5 psig in 5 minutes."

The probability of this scenario is estimated to be below 1.0E-10. The NRC calculation must have used two assumptions, which invalidate the results: (1) the reactor building is sealed (no ventilation), and (2) the building is adiabatic (no heat transfer to the outside). A typical reactor building ventilation system has capacity of approximately 80,000 cfm. Upon isolation of the normal ventilation, the standby gas treatment system will initiate and provide a continuing exhaust from the reactor building. Additionally, heat transfer to the outside cannot be turned off. The building walls of typical refueling decks consist of steel or precast concrete siding. These walls and the ceiling would act as large condensing surfaces. At a decay power of 20 MW, the required heat flux through the siding is estimated at 200 watts per sq ft, not an unsustainable value. We estimate that at approximately 10 MW, continuous boiling could occur indefinitely without pressurizing the reactor building if only one standby gas treatment train remains operable. The secondary containment release scenarios do not appear to be credible and should be removed from the NUREG.

6.9.5 Findings: Please review the "Findings" considering the comments provided with respect to Section 6.9.1.

Section 7

7.2(1): The suggested regulatory controls are already addressed in general in NUMARC 91-06. We recommend no regulatory action until the effectiveness of NUMARC 91-06 has been evaluated.

7.2.(2): Additional benefit derived from a specific shutdown fire hazards analysis when compared to the existing fire hazards analysis coupled with the guidance of NUMARC 91-06 has not been demonstrated. Requiring a fire hazards analysis for all modes and plant configurations encountered after hot standby/shutdown conditions is unrealistic. What does the NRC require for inclusion in the specific fire hazards analyses (second sentence in 7.2(2)(a))?

7.2.4: Need to define "reduced inventory" and "sensitive condition" for BWR. The existing BWR-4 STS requirements 3.4.9.2, 3.5.2, 3.9.11.1, and 3.9.11.2 meet the recommended improvements discussed in 7.2(4)(a)(i) and (ii). No further changes to the Tech Specs are necessary for BWRs in this regard.

7.2(4)(b): This statement is confusing. Is this BWR or PWR mode 5? What is meant by "automatic requirements"? Assuming this means cold shutdown, does this refer to the requirements that force the plant to proceed to cold shutdown, or does it refer to related requirements in cold shutdown? Does this endorse performing RHR maintenance in other than cold shutdown conditions? In addition, "optimal" RHR capability may be excessive; only "adequate" requirements need to be ensured.

Also please define the term "integral RCS" which appears in the first sentence of the first paragraph.

5th Paragraph (page 7-6): "For BWRs, the Staff is unaware of any plans to close primary containments -----." Was this an observation, and how does this relate to improvements in Tech Specs? We recommend this statement be moved to Section 6.

7.3: This section does not significantly contribute to this draft NUREG.

This letter has been endorsed by a substantial number of the members of the BWR Owners' Group; however, these comments should not be interpreted as a position of any individual member.

If you desire to discuss these comments in more detail, please contact me at your convenience.

Very truly yours,

R. D. Binz IV, Chairman
BWR Owners' Group

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cc: BWROG Primary Representatives
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