

SAFETY EVALUATION REPORT
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3
RECOMBINER CAPABILITY REQUIREMENTS
OF 10 CFR 50.44(c)(3)(ii) (RESPONSE TO GENERIC LETTER NO. 84-09)

Background

On December 2, 1981, the NRC amended §50.44 of its regulations by additional provisions in §50.44 (c)(3). One of these provisions requires licensees of LWRs that rely upon purge/repressurization systems as the primary means of hydrogen control to provide a recombiner capability by the end of the first scheduled outage after July 5, 1982, of sufficient duration to permit the required modifications. Those plants for which notices of hearing or applications for construction permits were published on or after November 5, 1970, are not permitted by 10 CFR 50.44(e) to rely on purge/repressurization systems as the primary means for hydrogen control. Therefore, these plants are not affected by this requirement. However, the Peach Bottom, Units 2 and 3, are affected by the new requirement.

As a result of the new inerting requirements in §50.44(c)(3), the BWR Mark I Owners Group undertook a substantial program to demonstrate that the Mark I plants potentially affected by the recombiner capability requirements of the rule do not need to rely on the safety grade purge/repressurization system required by the original 10 CFR 50.44 rule as the primary means of hydrogen control. Extensive review and independent studies by the NRC staff supported the findings of the Mark I Owners Group program from the perspective of providing additional recombiner capability. The staff, however, did not conclude that the purge/repressurization system could be eliminated.

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The Commission has determined, for purposes of providing recombiner capability, that a Mark I BWR plant will be found to not rely on purge/repressurization systems as the primary means of hydrogen control, if certain technical criteria are satisfied. These criteria were clarified in the Generic Letter No. 84-09 (Ref. 1), dated May 8, 1984, which was sent to all licensees of operating reactors. Therefore, the recombiner capability defined in 10 CFR 50.44(c)(3)(ii) need not be furnished for those inerted Mark I BWR containments where the licensees are able to demonstrate that: 1) the Generic Study (Ref. 4) is applicable to the licensee's plant; 2) the plant has Technical Specifications requiring that when the containment is required to be inerted, the containment atmosphere be less than four percent oxygen; 3) the plant has only nitrogen or recycled containment atmosphere for use in all pneumatic control systems within containment; and 4) there are no potential sources of oxygen in containment other than that resulting from radiolysis of the reactor coolant.

Most of the affected Mark I BWR plants have Containment Atmosphere Dilution (CAD) Systems utilizing nitrogen or air. In order to clarify the staff's position regarding these systems, the Generic Letter 84-09 stated that a plant that has a "safety grade" purge/repressurization system designed to conform with the general requirements of criteria 41, 42 and 43 of Appendix A of 10 CFR Part 50 and installed in accordance with §50.44(f) or §50.44(g) must continue to have that system, even though it may be determined with respect to §50.44(c)(3) that the plant does not rely on that system as the primary means for hydrogen control; thus, a decision on recombiner capability does not affect

the requirements of §50.44(f) and §50.44(g) for the "safety grade" purge/re-pressurization system.

Evaluation

In a letter dated July 31, 1984, (Ref. 5), the licensee for Peach Bottom Atomic Power Station, Units 2 and 3, the Philadelphia Electric Company, submitted a response to the staff's Generic Letter 84-09. The licensee stated that the criteria presented in Generic Letter 84-09 are satisfied for the Peach Bottom, Units 2 and 3, and therefore, a recombiner capability is not required.

CSB has reviewed the compliance of Peach Bottom Station, Units 2 and 3 with the criteria set by the staff (Ref. 1, 2 & 3). We have found that: The licensee has participated in the generic study (Ref. 4) made by the BWR Owners Group. The main parameter regarding the applicability of the study was found to be the ratio of the core thermal power to the free drywell volume. The applicability of the study to Peach Bottom, Units 2 and 3, was addressed in Chapter 1.3 of the study.

Since Peach Bottom was one of the plants used in the generic study, we agree with the conclusions that the generic study is applicable to Peach Bottom, Units 2 and 3, providing that the three criteria of Generic Letter 84-09 as discussed below have been satisfied.

- 1) Peach Bottom, Units 2 and 3, Technical Specification 3.7.A.5.a requires that when the containment is inerted, the containment atmosphere is to contain less than four percent oxygen. This satisfies the first of the three criteria of Generic Letter 84-09.
- 2) The pneumatic controlled systems inside containment are supplied with recycled containment atmosphere from the Primary Containment Instrument Gas System. As a back up, the essential pneumatic users inside containment are provided with safety-grade nitrogen gas cylinders. The instrument air system can be used as a back-up to the normal nitrogen supply. In case of a pressure loss in the drywell pneumatic system, the instrument air back-up system would be automatically actuated.

It has been confirmed with the licensee during a telecon, dated April 3, 1985, that the operators have the instrumentation needed to be aware of the actuation of the back-up air system and, therefore, proper action can be taken. In case of an accident, the back-up air system supply lines would automatically be isolated. The CSB finds this acceptable, however, the description of the use of the back-up air system should be formally documented. The licensee has committed to do that in a future submittal.

The CAD system at Peach Bottom uses nitrogen as its working fluid.

Based on the above discussion, we find that Peach Bottom meets the second of the three criteria of Generic Letter 84-09.

- 3) The licensee performed an engineering study to identify the potential sources of oxygen in the containment. The only credible source of oxygen found was the radiolysis of the reactor coolant.

The Service Air System at Peach Bottom Station is normally valved out and, therefore, is not a source of oxygen into the containment. Peach Bottom does not have breathing air systems, inflatable door seals, pressurized penetrations or MSIV-leakage control systems that could be considered as potential oxygen sources.

The licensee has committed to provide written documentation to confirm the bases to disregard the potential sources of oxygen mentioned above, as discussed during the telecon, dated April 3, 1985. The licensee provided this documentation on May 1, 1985(6).

Conclusion

We conclude that the proposed bases for not furnishing a recombiner capability for the Peach Bottom Units 2 and 3 are acceptable.

References:

- (1) Letter from D. G. Eisenhut to All Licensees dated May 8, 1984,
"Recombiner Capability Requirements of 10 CFR 50.44(c)(3)(ii)
(Generic Letter 84-09).
- (2) Memorandum from R. J. Mattson to D. G. Eisenhut dated January 24, 1984,
"DSI Review of Requests from Mark I/BWR Licensees for Relief from the
Hydrogen Recombiner Capability requirement of 10 CFR Part 50.44."
- (3) SECY-83-292, "Applicability of Recombiner Capability Requirements of
Revised 10 CFR 50.44 to BWR licensees with Mark I Containments."
- (4) "Generation and Mitigation of Combustible Gas Mixtures in Inerted BWR
Mark I Containments," by F. R. Hayes, L. B. Nesbitt and P. P. Stancavage.
Technical Report NEDO-22155/82-NEDO-69/CLASS 1/June 1982.
- (5) Letter from S. L. Daltroff, PECO, to D. G. Eisenhut, NRC, dated July 31,
1984, "Recombiner Capability Requirements of 10 CFR 50.44(c)(3)(oo)."
- (6) Letter from S. L. Daltroff, PECO, to H. L. Thompson, NRC, dated May 1, 1985.