

**ADVISORY COMMITTEE ON REACTOR SAFEGUARDS**  
**UNITED STATES ATOMIC ENERGY COMMISSION**  
**WASHINGTON, D.C.**

May 11, 1966

Honorable Glenn T. Seaborg  
Chairman  
U. S. Atomic Energy Commission  
Washington, D. C.

Subject: REPORT ON BOILING NUCLEAR SUPERHEATER (BONUS) POWER STATION

Dear Dr. Seaborg:

At its seventy-third meeting, May 5-7, 1966, the Advisory Committee on Reactor Safeguards reviewed the proposed transfer of the joint Combustion Engineering (CE) and Puerto Rico Water Resources Authority (PRWRA) BONUS Provisional Operating Authorization to PRWRA and conversion of the Provisional Operating Authorization to an Operating Authorization of ten years' duration. In its review, the Committee had the benefit of discussions with representatives of PRWRA, CE, and the AEC Staff. The Committee also had the benefit of the documents referenced below. Subcommittee meetings were held in Washington, D. C. on May 11, 1965, and in Puerto Rico on June 30, 1965, and April 12 and 13, 1966. The Committee previously commented on the BONUS Station in letters dated March 14, 1960 and September 12, 1963.

The reactor attained initial criticality on April 13, 1964, and completed its startup phase operations on December 19, 1965, following a 30-day Full Power Demonstration Run. A number of significant problems were encountered during the startup phase, including failed fuel, cracked superheater piping within the reactor pressure vessel, and control rod drive and instrumentation defects. Some of these problems remain to be resolved.

In addition to the above, there are a number of other problems in the BONUS Station. For example, reviews have revealed important deficiencies in the automatic scram system. Other problems are known to exist with non-redundant features of engineered safeguards. Additionally, the Committee feels that the control rod drives should have an increased ratio of rod drop force to rod sticking force.

While none of the existing problems constitutes an immediate hazard, the Committee recommends that the design of the BONUS plant be carefully reviewed by the applicant with the aid of competent independent

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experts, to identify safety problems such as the examples given above and to suggest improvements to resolve or eliminate the problems. Criteria should be clarified or developed, as needed, together with a clear definition of objectives for the program. The AEC Regulatory Staff should follow this program closely. The Committee would like to review before June, 1967 a program for the necessary upgrading of the BONUS Station, and recommends completion of the design phase and accomplishment of some of the more urgent equipment modifications by that time.

PRWRA personnel have been fulfilling an increasing portion of the operating responsibility during the last two years as they gained experience. The Committee was favorably impressed with the knowledge and competence of PRWRA personnel, and believes that they can operate the BONUS Station without undue risk to the health and safety of the public. The Committee, therefore, recommends approval of the proposed changes in the Operating Authorization, but also recommends prompt, vigorous, and competent prosecution of the upgrading program.

Sincerely yours,

/s/ David Okrent

David Okrent  
Chairman

References attached.

References - BONUS

1. Application for Modification of Operating Authorization DPRA-4, dated November 30, 1964.
2. CE letter, dated December 1, 1964, re: Superheater Fuel Cladding Failure.
3. PRWRA letter, dated January 25, 1965, re: Nuclear Instrumentation Modifications.
4. CE letter, dated May 6, 1965, re: Changes in Facility and Operating Procedures.
5. PRWRA letter, dated July 22, 1966, re: Questions Raised by ACRS Subcommittee.
6. Revision No. 1, dated December 24, 1965, to PRWRA Application for Modification of Operating Authorization DPRA-4.
7. CEND/PRWRA-257, Startup Summary Report, dated February 1966.
8. CEND/PRWRA-257A, Abstract of Startup Summary Report, dated March 1966.
9. PRWRA letter, dated March 1, 1966, re: Chairman of BONUS Safety Committee.
10. PRWRA letter, dated April 20, 1966, and attached Analysis of BONUS Plant Safety Systems.