

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

March 14, 1975

Honorable William A. Anders
Chairman
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: GENERAL ELECTRIC STANDARD SAFETY ANALYSIS REPORT (GESSAR-238)

Dear Mr. Anders:

At its 179th Meeting, March 6-8, 1975, the Advisory Committee on Reactor Safeguards completed a review of the General Electric Standard Safety Analysis Report (GESSAR). GESSAR-238 provides the safety information for a reference system consisting of a single BWR-6/Mark III nuclear system, with a rated core thermal power of 3579 MW(t), and of the associated systems including the reactor building (the shield building and containment), fuel building, auxiliary building, diesel generator buildings, control building, radwaste building,, and the off-gas system. Subcommittee meetings were held with representatives of the General Electric Company and the Nuclear Regulatory Commission (NRC) Staff on July 1, 1974, and September 11, 1974, in Washington, D. C., on November 9, 1974, in Bloomington, Minnesota, and on January 18, 1975, in Washington, D.C. The Committee also had the benefit of the documents listed below.

Site envelope parameters are included in GESSAR and application of GESSAR will require that specific site evaluations be made to confirm the acceptability of the site within the GESSAR design. The use of GESSAR for multiple reactor units at a single station will also require review of the safety-related components of plant duplication and layout.

Safety-related interfaces between the reference system and the balance of plant are specified in GESSAR. Since the utility-applicant is responsible for instituting the quality assurance programs necessary to assure that all safety-related interfaces have been identified and that all safety-related requirements are being fulfilled, the Committee will review these matters in more detail with the Applicants on a case-by-case basis. The Committee recommends that, during the design, procurement, construction and startup, timely and appropriate interdisciplinary system analyses be carried out to assure complete functional compatibility across each interface for an entire spectrum of anticipated operations and postulated design basis accident conditions.

The NRC Staff has identified 13 items requiring resolution prior to issuing their Preliminary Design Approval (PDA). The Committee believes that all of these matters should be resolved in a manner satisfactory to the NRC Staff. The Committee wishes to be kept informed regarding the resolution of the following items:

1. Seismic capability of the offgas system.
2. Provisions to satisfy the single-failure criterion for the RHR system.
3. Additional requirements to be imposed if continuous venting of the containment is used.
4. Evaluation of the performance of the emergency core cooling systems using evaluation models meeting the requirements of 10 CFR 50.46, Appendix K.

The latest ACRS reports on nuclear generating stations utilizing the BWR-6/Mark III systems were the December 12, 1974 reports on the Allens Creek Nuclear Generating Station, Units 1 and 2, and the Perry Nuclear Power Plant, Units 1 and 2. In these reports, the ACRS has recommended that the ongoing R&D programs be used to fully resolve issues involving the Mark III containment design prior to completion of the affected portions of the plant. Further, additional generic matters, which include anticipated transients without scram (ATWS) and possible pump overspeed during a loss of coolant accident, should be dealt with appropriately by the NRC Staff. It is expected, that these items will be resolved in a manner satisfactory to the NRC Staff following Preliminary Design Approval (PDA) of GESSAR and prior to Final Design Approval (FDA). During this interim period, the Committee will continue to review these items on a case-by-case basis as well as through other appropriate ACRS Subcommittee meetings and full Committee meetings.

The Committee has not reviewed modifications which are expected to be made in the BWR/6 8x8 fuel. Such modifications and any other proposed changes will be reviewed when the appropriate documentation has been submitted and the improvements sought can be evaluated.

The introduction of new features in the instrumentation and control systems has been submitted through the specification of functional designs and design criteria which the NRC Staff has found to be adequate for the PDA. As in previous reports on related matters the Committee recommends that the NRC Staff determine the necessary environmental and reliability tests, including in situ tests where desirable for qualification of the new systems. In another matter relating to a periodic testing provision, the General Electric Company has committed to a study of the improvement of the testability of the automatic depressurization system. On all these issues involving instrumentation and control, the Committee will use the case-by-case basis to ascertain progress of the work until the GESSAR design has progressed to the stage where Final Design Approval is achieved.

The Committee will need to review the development and proof testing of the fast scram system, and the implementation of the proposed Reactor Manual Control System along with the provisions for ganged rod withdrawal.

The Committee believes that the General Electric Company and the NRC Staff should continue to review GESSAR for design changes that would further improve industrial security features.

The GESSAR design should include provisions which anticipate the maintenance, inspection, and operational needs of the plant throughout its service life, including cleaning and decontamination of the primary coolant system, and eventual decommissioning. In particular, the Committee believes that the NRC Staff and the General Electric Company should review methods and procedures for removing accumulations of radioactive contamination whereby maintenance and inspection programs can be more effectively and safely carried out.

The Committee believes that methods that seek to develop reference systems through standardization and through replication need to be coupled with ongoing programs that will permit changes which improve safety and which, when justified, would be implemented in a timely manner. Use of reference systems should lead to more efficient and effective licensing reviews. Programs such as GESSAR will contribute to this process. A transition period will be required in which the Committee would still give considerable attention to the items noted, on a case-by-case basis.

The Committee believes that, subject to the above comments and to successful completion of the R&D programs, GESSAR-238 can be successfully engineered to serve as a reference system.

Sincerely yours,



William Kerr
Chairman

References attached.

References

1. BWR/6 Standard Safety Analysis Report, Volume 1 through 7.
2. Amendments 1 through 28 to the Standard Safety Analysis Report.
3. General Electric Company letters and reports:
 - a. July 31, 1973 letter forwarding proprietary information in support of the information made public in the safety analysis report.
 - b. August 31, 1973 letter forwarding proprietary fuel data.
 - c. September 28, 1973 letter forwarding proprietary information regarding core power distribution.
 - d. December 28, 1973 letter regarding interfaces and electrical systems.
 - e. November 6, 1974 letter regarding physics verification and number of safety/relief valves.
 - f. February 19, 1974 letter regarding ATWS.
4. AEC/NRC Staff letters and reports:
 - a. October 11, 1974 draft Safety Evaluation Report.
 - b. November 13, 1974 Safety Evaluation Report.
 - c. December 7, 1974 Supplement No. 1 to the Safety Evaluation Report.
 - d. January 30, 1975 letter regarding reevaluation of the high pressure drywell test.
 - e. February 21, 1975 Supplement No. 2 to the Safety Evaluation Report.
 - f. March 4, 1975 Supplement No. 3 to the Safety Evaluation Report.