ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

May 15, 1969

Honorable Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON ROBERT EMMETT GINNA NUCLEAR POWER PLANT UNIT NO. 1

Dear Dr. Seaborg:

During its 109th meeting, May 8-10, 1969, the Advisory Committee on Reactor Safeguards completed its review of the application by the Rochester Gas and Electric Corporation for a license to operate the Robert Emmett Ginna Nuclear Power Plant Unit No. 1 at power levels up to 1300 MWt. The Committee had previously met with the applicant during its 103rd meeting, October 31 to November 2, 1968, to review an important change in the design of the large penetrations of the containment, and again during its 108th meeting, April 10-12, 1969, for a partial review of the application. During the review, Subcommittee meetings were held on October 24, 1968 (at the site); January 23, 1969; March 5, 1969; and May 1, 1969. In the course of the review, the Committee had the benefit of discussions with representatives of the applicant, the Westinghouse Electric Corporation, Gilbert Associates, Inc., and their consultants; of discussions with the AEC Regulatory Staff and its consultants; and of the documents listed. The Committee reported to you on the construction permit application for this plant on March 18, 1966.

The reactor primary fluid system, containment, and engineered safety features all incorporate important developments from the design of previously licensed pressurized water reactors. The developments reflect both economic and safety considerations, and the plant represents the first of the line of Westinghouse reactors currently being licensed for construction.

The applicant is re-examining his estimate of the appropriate design flood level, including still water level, wave action, and wave runup. In the event of disagreement with the AEC Regulatory Staff, he will assure plant protection consistent with the flood estimates by the Staff consultants.

The applicant has agreed to install a strong-motion accelerograph if considered necessary. The Committee believes that at least one strong-motion accelerograph should be installed and, in addition, wishes to point out that a strong-motion accelerograph could minimize the possibility of a lengthy shutdown for inspection in the event that a significant earthquake of otherwise undetermined intensity at the site should occur.

The high thermal performance demanded of the fuel in the Ginna reactor, and the potential for axial xenon oscillations, requires that the spatial power distribution in the reactor core and the positions of the control rods be dependably known. In the proposed design all alarms related to control-rod malpositioning are derived from the on-line computer. The Committee believes good information regarding possible anomalies in the power distribution is important and that, as a minimum, the power should be reduced appropriately, or adequate alternative measures should be taken, when the computer is inoperative.

The applicant and the Regulatory Staff are not in agreement on the radioactivity that might be released and the off-site dose that could result from dropping a spent fuel assembly in the storage pit. The applicant will attempt to reconcile the disagreement but, if necessary, will take corrective measures to satisfy safety criteria in accordance with the Staff model for this postulated accident. The applicant will not handle irradiated fuel until this matter is resolved.

The applicant calculates that the reactor pressure vessel wall will be exposed to a fairly large fast neutron fluence (about 3.7×10^{19}) over the reactor life. This will lead to a sizeable increase in the nil ductility transition temperature and to some degradation in fracture toughness properties. Prior to the accumulation of a peak fluence of 10^{19}, the Regulatory Staff should reevaluate the continued suitability of the currently proposed reactor vessel startup, cooldown and operating conditions, as well as the assurance of vessel integrity despite thermal shock in the unlikely event of a loss-of-coolant accident.

The Committee understands that the applicant is providing means for preoperational monitoring of the pressure vessel and other parts of the primary system for signs of excessive internal vibration or structural damage. The Committee believes the applicant should give consideration to a program of monitoring during the service life of the plant.

The Committee believes the applicant's proposal of an in-service inspection program for the reactor pressure vessel and other portions of the primary system covering the first five years of operation, with a commitment to review the program after that period in the light of then-existing inspection technology, is satisfactory. The applicant has modeled his inspection program on the draft USA code dealing with in-service inspection; the Committee concurs in this approach.

Several Westinghouse reports pertinent to Ginna and other Westinghouse reactors have recently been received and others are expected. Some matters relating to Ginna consequently remain to be resolved by the Staff either before plant operation or on an acceptable time scale subsequent to initial operation. These matters include assurance of long-term compatibility of the containment spray solution with the exposed materials in the containment and verification of the performance of the hydrogen recombiners that may be necessary in the unlikely event of a loss-of-coolant accident; evaluation of the probability and consequence of systematic instrument failures. A more detailed analysis of the dynamic response of a portion of the system piping to an earthquake is also being prepared by the applicant for review by the Staff. The Committee believes that these matters will be resolved satisfactorily.

The Advisory Committee on Reactor Safeguards believes that, if due regard is given to the items mentioned above, the Robert Emmett Ginna Nuclear Power Plant Unit No. 1 can be operated at power levels up to 1300 MWt without undue risk to the health and safety of the public.

Additional remarks of Dr. David Okrent are attached.

Sincerely yours,

/s/

Stephen H. Hanauer
Chairman

Attachments:
1. Additional Remarks of Dr. David Okrent
2. References

Dr. David Okrent makes the following additional remarks:

"In view of the great importance of pressure vessel integrity to the health and safety of the public, I believe that for welds in the pressure vessel wall that will receive a large integrated fast neutron irradiation over the reactor life it would be prudent for the applicant to commit himself to a more thorough and extensive in-service, non-destructive, volumetric testing program by such means as are or become practical. In particular, within the framework of currently anticipated technology, I would recommend a commitment to 100% ultrasonic inspection of such a weld every ten years. Consideration should also be given to non-destructive, volumetric inspection or monitoring of those steel forgings making up the vessel wall that will be highly irradiated."

References - Robert Emmett Ginna Nuclear Power Plant Unit No. 1

1. Preliminary Facility Description and Safety Analysis Report, Volume 1, Appendices.

2. Amendments 6-17 and Amendment 19 to Application for Licenses.