UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SUPPLEMENTAL SAFETY EVALUATION BY

THE OFFICE OF NUCLEAR REACTOR REGULATION

CONFORMANCE TO REGULATORY GUIDE 1.97

POST-ACCIDENT NEUTRON FLUX MONITORING INSTRUMENTATION

ROCHESTER GAS AND ELECTRIC CORPORATION

R. E. GINNA NUCLEAR POWER PLANT

DOCKET NO. 50-244

1.0 INTRODUCTION

Section 6.2 of Generic Letter 82-33 requested applicants and licensees to provide a report on their implementation of Regulatory Guide (RG) 1.97, Revision 2, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following and Accident," and methods for complying with the Commission's regulations, including supporting technical justification of any proposed deviations or alternatives. A review of Rochester Gas and Electric Corporation's submittals, dated January 31, 1984, February 28, 1985, June 16, 1986, and July 13, 1990, was performed and a Safety Evaluation (SE) was issued on December 4, 1990. This SE concluded that the licensee did not adequately justify deviations from the guidance of RG 1.97 for the instrumentation that monitors neutron flux at the R. E. Ginna Nuclear Power Plant.

By letters dated May 6, 1991, February 3, 1995, and September 20, 1995, the licensee provided additional information in support of their requested deviations from the regulatory guide position for environmentally qualified neutron flux monitoring instrumentation. In support of this request, the licensee submitted a report which presents the results of a safety assessment of design basis and beyond design basis accident analyses. The safety assessment determined that accident diagnosis and plant recovery can be successfully accomplished using Emergency Operating Procedures (EOPs) and alternate instrumentation and, therefore, environmentally qualified neutron flux monitoring instrumentation would not be necessary.

2.0 EVALUATION

The licensee's report analyzed various event scenarios to determine the consequences of neutron flux monitoring unavailability and concluded that the failure of this instrumentation will not prevent the operator from determining

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reactor power levels. Fully environmentally qualified core exit temperature and reactor coolant system (RCS) hot and cold leg temperature would be available from which reactor power may be inferred. In addition, boron concentration status indication may be available.

During an accident that involves normal containment conditions, the licensee's neutron flux monitoring instrumentation would be expected to be available and the licensee would monitor the reactivity state of the core by evaluating neutron flux behavior measured by the neutron flux monitoring instrumentation as well as core exit temperature, RCS hot and cold leg temperatures, and boron concentration.

However, during an accident that involves adverse containment conditions, where the neutron flux monitoring instrumentation may be rendered inoperable, the operator would monitor core and RCS temperature behavior by core exit temperature, RCS hot leg temperature, and RCS cold leg temperature instrumentation. Additionally, the shutdown margin would be verified by monitoring boron concentration. The EOPs would also direct the operator to assure that boric acid injection is taking place adding negative reactivity to ensure that the core is shutdown.

The licensee is also providing training enhancements to the operators in the use of (a) core exit temperature measurements, to ensure that the decay heat removal capacity is not exceeded, (b) boron monitoring instrumentation, to ensure that the boron concentration is within proper limits, and (c) RCS hot and cold leg temperature measurements during a slow power transient, to determine if an emergency boration is required.

Since the licensee's neutron flux monitoring instrumentation is expected to be available during an accident that involves normal containment conditions and the licensee's EOPs require the monitoring of core exit temperatures, RCS temperatures, boron concentration, and the assurance of boron injection, during an accident that involves adverse containment conditions, the staff finds the existing neutron flux monitoring instrumentation to be acceptable for meeting the recommendations of RG 1.97.

3.0 CONCLUSION

Based on review of the licensee's submittals, the NRC staff concludes that the existing post-accident neutron flux monitoring instrumentation at the R. E. Ginna Nuclear Power Plant is acceptable with respect to conformance to RG 1.97, Revision 2 on the basis of appropriate environmentally qualified alternate instrumentation and boron injection capability as directed in the plant EOPs.

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