



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENCLOSURE 1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ROCHESTER GAS AND ELECTRIC COMPANY

R. E. GINNA NUCLEAR POWER PLANT

DOCKET NO. 50-244

CONFORMANCE TO REGULATORY GUIDE 1.97

1.0 INTRODUCTION

Rochester Gas and Electric Company was requested by Generic Letter 82-33 to provide a report to NRC describing how the post-accident monitoring instrumentation meets the guidelines of Regulatory Guide (R.G.) 1.97 as applied to emergency response facilities. The licensee responded to Item 6.2 of the Generic Letter on January 31, 1984. Additional information was provided by letters dated February 28, 1985, June 16, 1986, and July 13, 1990.

A detailed review and technical evaluation of the licensee's submittals was performed by EG&G Idaho, Inc., under a contract to the NRC, with general supervision by the NRC. This work was reported by EG&G in Technical Evaluation Report (TER), "Conformance to Regulatory Guide 1.97: Ginna," dated September 1990 (attached). The NRC has reviewed this report and concurs with the conclusion that the licensee either conforms to, or has adequately justified deviations from, the guidance of R.G. 1.97 for each post-accident monitoring variable except for the variables neutron flux, containment isolation valve position, residual heat removal (RHR) heat exchanger outlet temperature, accumulator tank pressure, and emergency ventilation damper position.

2.0 EVALUATION CRITERIA

Subsequent to the issuance of the generic letter, the NRC held regional meetings in February and March 1983 to answer licensee and applicant questions and concerns regarding the NRC policy on R.G. 1.97. At these meetings, it was established that the NRC review would only address exceptions taken to the guidance of R.G. 1.97. Further, where licensees or applicants explicitly state that instrument systems conform to provisions of the regulatory guide, no further staff review would be necessary. Therefore, the review performed and reported by EG&G, only addresses exceptions to the guidance of R.G. 1.97. This safety evaluation addresses the licensee's submittals based on the review policy described in the NRC regional meetings and the conclusions of the review as reported by EG&G.

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3.0 EVALUATION

The NRC has reviewed the evaluation performed by EG&G contained in the attached TER and concur with its bases and findings, except for the finding contained in TER section 3.3.8 concerning a) accumulator tank pressure. For the remaining items, the NRC agrees with EG&G's findings that the licensee conforms to, or has provided an acceptable justification for deviations from the guidance of R.G. 1.97 for each post-accident monitoring variable except for the variables, b) neutron flux, c) containment isolation valve position, d) RHR heat exchanger outlet temperature, and e) emergency ventilation damper position.

- a) In TER section 3.3.8 EG&G concluded that for the variable accumulator tank pressure, the licensee should provide instrumentation for the accumulator pressure that meets the requirements and criteria of R.G. 1.97 and 10 CFR 50.49. The NRC, however, is currently reviewing the need for environmentally qualified Category 2 instrumentation to monitor accumulator tank pressure. The NRC will therefore report on the acceptability of this item when the generic review is complete.
- b) Regulatory Guide 1.97 recommends Category 1 neutron flux instrumentation to monitor reactivity control. The instrumentation provided by the licensee is not environmentally qualified. The justification provided by the licensee supporting this lack of environmental qualification is that core exit thermocouples, the reactor vessel level indicating system, and soluble boron concentration analysis can assure the core is shut down and remains subcritical.

The licensee bases the use of alternate instrumentation on anticipated conditions resulting from standard design basis analysis conditions. These events are normally considered reasonably comprehensive. However, the instrumentation recommendations of R.G. 1.97 intends to cover a wide range of possibilities, including conditions not necessarily anticipated following standard event analysis defined paths.

R.G. 1.97 specifies neutron flux as the key variable for determining the accomplishment of reactivity control. It is designated as a key variable because it is a direct measurement, not an indirect or lagging indication. The instrumentation proposed by the licensee does not directly measure reactivity control.

R.G. 1.97 specifically states that Category 1 instrumentation should meet the environmental qualification requirements of R.G. 1.89. 10 CFR 50.49, explicitly references R.G. 1.97, which requires environmental qualification of all Category 1 instrumentation. Thus, the Category 1 designation is appropriate for neutron flux monitoring instrumentation.

Therefore, the licensee's deviation from the Category 1 criteria is unacceptable. The licensee should provide neutron flux monitoring instrumentation that meets the Category 1 criteria, including environmental qualification, of 10 CFR 50.49 and R.G. 1.97.



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- c) R.G. 1.97 recommends Category 1 instrumentation to monitor the position of containment isolation valves. The instrumentation provided by the licensee is not environmentally qualified. The justification provided by the licensee is that failure of the position indication will not cause the loss of any safety function, or incorrect operator actions.

The instrumentation recommended by R.G. 1.97 is to provide the operator with a complete picture of what is taking place in the plant. If an indication for containment isolation valve position is erroneously indicated closed when a valve is actually open, the operator would incorrectly assume that the containment is isolated. If an indication for containment isolation valve position is erroneously indicated open when a valve is actually closed, the operator would incorrectly assume that the containment is not isolated. Therefore, the licensee's deviation is unacceptable. The licensee should provide environmentally qualified containment isolation valve position instrumentation, for those valves located in a post-accident harsh environment, in accordance with 10 CFR 50.49 and R.G. 1.97.

- d) R.G. 1.97 recommends Category 2 RHR heat exchanger outlet temperature to monitor the operation of the RHR system. The instrumentation provided by the licensee is not environmentally qualified. The licensee's justification for not providing environmental qualification is that this instrumentation is not required by the emergency operating procedures.

The licensee's position does not address the purpose of R.G. 1.97 instrumentation. The instrumentation recommendations of R.G. 1.97 are intended to cover a wide range of possibilities, including conditions not necessarily anticipated following standard event analysis defined paths.

The RHR system is used for an extended period of time after shutdown from power operation. RHR heat exchanger outlet temperature information must be operational or an adequate alternative provided for verifying RHR performance.

Therefore, the licensee's deviation from the Category 2 criteria is unacceptable. The licensee should provide instrumentation that meets the Category 2 criteria, including environmental qualification of 10 CFR 50.49 and R.G. 1.97.

- e) R.G. 1.97 recommends Category 2 emergency ventilation damper position instrumentation to indicate the damper status of the ventilation system. The licensee has identified supply and exhaust mini-purge valves for this variable. The licensee has also stated that these valves are included under the scope of containment isolation valves. The licensee has not provided any information on the post-accident environment of these valves. The licensee also has not provided any information concerning the environmental qualification of the position switches for these valves. If these valves can be exposed to a harsh post-accident environment they should be environmentally qualified. The licensee should ensure that this instrumentation, including position switches and cables, is environmentally qualified in accordance with 10 CFR 50.49 and R.G. 1.97.



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4.0 CONCLUSION

Based on the NRC's review of the enclosed TER and the licensee's submittals, we find that the R. E. Ginna Nuclear Power Plant design, is acceptable with respect to conformance to R.G. 1.97, Revision 3, except for the instrumentation associated with the variables a) accumulator tank pressure, b) neutron flux, c) containment isolation valve position, d) RHR heat exchanger outlet temperature, and e) emergency ventilation damper position.

- a) The acceptability of instrumentation for accumulator tank pressure will remain open pending the outcome of the staff's review of the need for environmentally qualified instrumentation to monitor this variable. The NRC's conclusion will be reported on when the generic review is complete.
- b) It is the NRC's position that neutron flux monitoring instrumentation is needed by the operator to monitor reactivity control. It is also the NRC's position that the licensee should provide environmentally qualified neutron flux monitoring instrumentation that meets the Category 1 criteria of 10 CFR 50.49 and R.G. 1.97.
- c) It is the NRC's position that containment isolation valve position instrumentation is needed by the operator to monitor containment isolation. It is also the NRC's position that the licensee should provide environmentally qualified containment isolation valve position instrumentation that meets the Category 1 criteria of 10 CFR 50.49 and R.G. 1.97.
- d) It is the NRC's position that RHR heat exchanger outlet temperature instrumentation is needed by the operator to monitor the operation of the RHR system. It is also the NRC's position that the licensee should provide environmentally qualified RHR heat exchanger outlet temperature instrumentation that meets the Category 2 criteria of 10 CFR 50.49 and R.G. 1.97.
- e) It is the NRC's position that information provided by emergency ventilation damper position instrumentation is needed by the operator to monitor the position of the emergency ventilation dampers. It is also the NRC's position that the licensee should provide environmentally qualified emergency ventilation damper position instrumentation in accordance with 10 CFR 59.49 and R.G. 1.97 or information concluding that this equipment will not be subjected to a harsh environment.

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Attachment
(as stated)

