



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

July 7, 1992

Docket No. 50-244

Dr. Robert C. Mecredy,  
Vice President, Nuclear Production  
Rochester Gas & Electric Corporation  
89 East Avenue  
Rochester, New York 14649

Dear Dr. Mecredy:

SUBJECT: EMERGENCY RESPONSE CAPABILITY - REQUEST FOR ADDITIONAL INFORMATION  
(TAC NO. M80439)

The NRC issued a Safety Evaluation (SE) with its attached Technical Evaluation Report (TER) on December 4, 1990, having completed a review of your conformance to Regulatory Guide (RG) 1.97, Revision 3. The SE/TER found your design acceptable with five exceptions (open items) with respect to conformance to RG 1.97, Revision 3. The five exceptions identified pertain to the instrumentation to monitor neutron flux, containment isolation valve position, residual heat removal heat exchanger outlet temperature, accumulator tank pressure, and emergency ventilation damper position.

An NRC request for additional information (RAI) letter of March 22, 1991, indicated the need for clarification with regard to Ginna Station's conformance to RG 1.97, Revision 3. Apparently miscommunication existed between NRC and Rochester Gas & Electric (RG&E) with regard to conformance to regulatory guidance. RG&E provided their responses to the RAI of March 22, 1991, by letters dated May 6, 1991, May 16, 1991, and March 13, 1992. The staff reviewed RG&E's responses to the RAI of March 22, 1991, and concluded your justification for some items are acceptable. However, some items did not provide adequate justification.

Moreover, the NRC staff's understanding is that RG&E has not made a commitment to RG 1.97 for either existing instrumentation or future design changes. In lieu of a commitment it appears that RG&E has provided a comparison of existing instrumentation attributes with the criteria provided in RG 1.97. RG&E should detail a commitment to RG 1.97 addressing such criteria as electrical independence, and physical separation of equipment, and any other criteria not in full conformance with RG 1.97 as applied to existing instrumentation and future design changes.

The staff has prepared an additional RAI (Enclosure) for the purposes described above, and requests you to provide a response within 60 days of receipt of this letter. The staff also requests that a meeting be held to discuss the RAI. Your response should provide a commitment to RG 1.97 as a basis for NRC review.

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Dr. Robert C. Mecredy

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The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P. L. 96-511.

Sincerely,

/S/

Allen R. Johnson, Project Manager  
Project Directorate I-3  
Division of Reactor Projects I/II  
Office of Nuclear Reactor Regulation

cc w/enclosure:  
See next page

OFC	: PDI-3/LA	: PDI-3/PM	: SICB/BC with <i>summary</i>	: PDI-3(A)D	:
NAME	: <i>MR</i> <i>Brook</i>	: AJohnson	: mw	: SNewberry	: <i>W</i> <i>sas</i>
DATE	: <i>6/3</i> 92	: <i>6/30</i> 92	: <i>7/6</i> 92	: <i>7/10</i> 92	:
DOCUMENT NAME: GIM80439.RAI					



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Dr. Robert C. Mecredy

GINNA

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

ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION (RAI)  
BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
CONFORMANCE TO REGULATORY GUIDE 1.97  
ROCHESTER GAS AND ELECTRIC COMPANY  
R. E. GINNA  
DOCKET NO. 50-244

1. RCS Cold Leg Water Temperature

Regulatory Guide (R.G.) 1.97 recommends Category 1 instrumentation to monitor RCS cold leg water temperature. Category 1 criteria include recording the signal from at least one channel of instrumentation. Rochester Gas and Electric (RG&E) has two channels of instrumentation to monitor this variable, however, they do not record this variable. RG&E should record at least one channel of RCS cold leg water temperature information. This recording can be via dedicated recorder, computer, or data logger.

2. Containment Sump Water Level - Narrow Range

R.G. 1.97 recommends that narrow range containment sump water level be monitored by instrumentation with a range of top to bottom of the sump. RG&E lists the range of this instrumentation as zero to 30 feet. RG&E also lists the range of the wide range containment sump water level instrument up to 214 inches. The narrow range appears to be wider than the wide range. RG&E should resolve this apparent discrepancy.

3. Containment Isolation Valve Position

R.G. 1.97 recommends Category 1 instrumentation to monitor the position of containment isolation valves. Category 1 criteria include environmental qualification of those instruments and circuit components that can be exposed to a harsh environment.

Since there are redundant containment isolation valves, redundant indication for each isolation valve is not required.

RG&E states that the containment isolation valves located outside of containment do not encounter a harsh environment until after the automatic containment isolation signal has been bypassed. This harsh environment consists of radiation shine from recirculating fluids, in the order of  $10^5$  Rads. RG&E has not provided data that validates the assumption that the valve position switches will survive this environment. This environment occurs late in the recovery phase of an accident. The operator has time to verify valve position before a harsh radiation environment occurs, but RG&E has not addressed procedures that direct the operator to do this. RG&E should show how the recovery procedures verify the position of the containment isolation valves.

Category 1 criteria also include seismic qualification. RG&E states that, while the containment isolation valve position indication lamp holders are seismically qualified, the lamps themselves are not. The lamps are identified only as "commercially rugged." RG&E should provide additional information about the seismic testing and capabilities of the lamps and the assemblies. The information should show that these lamps are similar to other lamps that have been seismically qualified.

4. RHR Heat Exchanger Outlet Temperature

R.G. 1.97 recommends Category 2 instrumentation to monitor residual heat removal (RHR) heat exchanger outlet temperature. Category 2 criteria include environmental qualification. RG&E indicates that this instrumentation loop is not environmentally qualified. RG&E stated that performance of decay heat removal is sufficiently monitored by Category 1 RCS hot leg temperature, RCS cold leg temperature, core exit temperature, and sump temperature. RG&E has not provided information detailing how these instruments provide the status of the RHR system operation. RG&E should either describe how this alternate instrumentation provides RHR system operation and decay heat removal information or provide environmentally qualified RHR heat exchanger outlet temperature instruments.

5. Refueling Water Storage Tank Level

R.G. 1.97 recommends Category 1 instrumentation to monitor the refueling water storage tank level. Category 1 criteria include independent, separate power sources for the redundant instrument channels. RG&E states that the instrument loop for transmitter LT-920 is powered from instrument bus 1C and the instrument loop for transmitter LT-921 is powered from instrument bus 1A. Computer indication for LT-920 also receives power from instrument bus 1A.

RG&E should address the potential loss of instrument bus 1A affecting both channels and ensure that the loss of any one power source will not cause the loss of both redundant instrument channels.

6. Primary System Power Operated Relief Valve Position

RG&E has identified the power operated relief valve (PORV) position indication as a Type A variable. Type A variables must meet the Category 1 criteria which include independent Class 1E power sources. RG&E states that there are two PORVs, each with its own block valve. The position indication for PORVs are powered from safety-related battery bus B. Loss of safety-related battery bus B would cause the loss of the position indication for both valves. RG&E should provide an independent power supply for each of the two PORVs.

Category 1 criteria also include seismic qualification. RG&E states that, while the PORV position indication lamp holders are seismically

qualified, the lamps themselves are not. The lamps are identified only as "commercially rugged." RG&E should provide additional information about the seismic testing and capabilities of the lamps and the assemblies. RG&E should show that these lamps are similar to other lamps that have been seismically qualified.

7. Main Steam Flow

RG&E classifies main steam flow as a Type A variable. Type A variables must meet the Category 1 criteria. Category 1 criteria include independent, redundant Class 1E power sources. RG&E lists three power sources for the main steam flow instruments for steam generator A. These are instrument buses 1A, 1B, and 1A/1C. For steam generator B, the main steam flow instrumentation power sources are instrument buses 1C, 1D, and 1A/1C. Instrument bus 1D is not Class 1E. The nomenclature for instrument bus 1A/1C is not clear. The staff assumes that there is an auctioneering circuit between instrument buses 1A and 1C. However, RG&E's submittals do not show that the power circuits remain independent and redundant. RG&E should clearly show that the power sources for this instrumentation are independent and redundant. Using instrument bus 1D to power one instrument loop would be acceptable if the other two instrument loops have independent Class 1E power sources.

8. Letdown Outlet Flow

R.G. 1.97 recommends instrumentation to monitor letdown outlet flow with a range of zero to 110 percent. The instrumentation provided by RG&E has a range of zero to 100 gallons per minute. The upper limit of the span is equal to 100 percent. RG&E has not provided justification for this deviation. RG&E should either justify this deviation or provide letdown outlet flow instrumentation with a range of zero to 110 percent.

9. High-Level Radioactive Liquid Tank Level

R.G. 1.97 recommends instrumentation to monitor high radioactive liquid tank level. RG&E identifies waste drain tank level (LT-1001) and reactor coolant drain tank level (LT-1003) for this variable. The instrumentation provided for loop LT-1003 is acceptable. However, RG&E has no display, readout, or recording for loop LT-1001. RG&E has not provided justification for this deviation. RG&E should either justify this deviation or provide display, readout, and/or recording of the loop LT-1001 information.

10. Status of Standby Power

R.G. 1.97 recommends plant specific Category 2 instrumentation to monitor the status of standby power. RG&E has identified the parameters to be monitored for this variable. However, RG&E has no display,

readout, or recording for loop PT-1066 (nitrogen gas pressure). RG&E should either justify this deviation or provide display, readout, and/or recording of the loop PT-1066 information.

11. Particulates and Halogens

R.G. 1.97 recommends an instrument span of  $10^{-3}$   $\mu\text{Ci/cc}$  to  $10^2$   $\mu\text{Ci/cc}$  for monitoring particulates and halogens. The instrumentation provided by RG&E satisfies this recommendation for the lower end of the instrument span. The upper end of the span deviates as follows:

R-12A, containment vent	particulates --	10 $\mu\text{Ci/cc}$
	halogens --	1 $\mu\text{Ci/cc}$
R-14A, plant exhaust vent	particulates --	50 $\mu\text{Ci/cc}$
	halogens --	25 $\mu\text{Ci/cc}$

RG&E has not provided justification for these deviations. RG&E should either justify these deviations or provide particulates and halogens instrumentation with ranges in accordance with R.G. 1.97.

12. Plant and Environs Radiation

R.G. 1.97 recommends portable sampling with onsite analysis capability to monitor plant and environs radiation. R.G. 1.97 recommends an analysis span of  $10^{-3}$  R/hr to  $10^4$  R/hr for photons, and  $10^{-3}$  rads/hr to  $10^4$  rads/hr for beta radiation and low-energy photons. The instrumentation provided by RG&E satisfies the recommendation for the lower end of the analysis span. The upper end of the span deviates, with capabilities to  $10^3$  R/hr and  $10^3$  rads/hr respectively. RG&E has not provided justification for these deviations. RG&E should either justify these deviations or provide plant and environs radiation instrumentation with ranges in accordance with R.G. 1.97.

13. Redundancy and Separation

R.G. 1.97 recommends redundant channels for Category 1 instrumentation that are electrically independent and physically separated. Physical separation applies to safety-related redundant channels and separation from other equipment not classified important to safety, up to and including isolation devices. RG&E states that physical separation between channels is according to the design criteria in effect at the time of installation. As RG&E's design predates the R.G. 1.75 separation criteria, not all Category 1 channels have complete physical separation. RG&E states that the control room does not necessarily have physical separation between channels.

The staff finds this to be a good faith attempt (as defined in NUREG-0737, Supplement No. 1, Section 3.7) to meet NRC requirements. Therefore, the redundancy and separation is acceptable for those Category 1 variables where instrumentation is not otherwise upgraded to

meet the R.G. 1.97 recommendations. This deviation does not preclude the use of redundant (that is, two or more) channels of instrumentation for Category 1 or Type A variables. Where RG&E modifies Category 1 instrumentation, redundancy and separation should be provided for those portions of the instrumentation modified. Since RG&E's design predates the R.G. 1.75 separation criteria, not all modifications can fully comply with the redundancy and separation criteria of R.G. 1.97. RG&E should describe constraints on separation that the licensee will adhere to for future modifications of R.G. 1.97 instrumentation. RG&E should detail plans for a commitment to R.G. 1.97 addressing redundancy and separation, as they apply to future design changes.

14. Equipment Identification

R.G. 1.97 recommends that Type A, B, and C instruments designated as Category 1 or 2 should be specifically identified with a common designation on the control panels so that the operator can easily discern that these instruments are intended for use under accident conditions. RG&E has not provided any control room identification of this instrumentation.

RG&E states that a common designator would only be appropriate where several redundant instrument channels are provided of which only a few are post-accident qualified. However, RG&E has not shown this to be the predominant case. Without identification the Category 1 and 2 instrumentation are indiscriminate from Category 3 and non-post-accident instrumentation.

The intent of identifying the R.G. 1.97 instrumentation is to provide the operator with identification of a minimum set of instruments to monitor during post-accident situations. This identification would not restrict the operator to use only those instruments identified. The operator may supplement the R.G. 1.97 instrumentation with other instrumentation.

The staff has reviewed the R.G. 1.97 recommendations on the identification of R.G. 1.97 instrumentation and has determined that the Type A and the Category 1 instrumentation need control room identification. RG&E should develop a methodology for identifying post-accident monitoring instrumentation in the control room. The control room Type A and the Category 1 R.G. 1.97 instruments should be identified by the developed methodology. The operators should be trained in the use of the common designator.

15. Interfaces

R.G. 1.97 recommends the use of qualified isolation devices whenever Category 1 and Category 2 instruments interface with instrumentation or control circuits that have less stringent design criteria. The isolation devices should be considered part of the monitoring



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instrumentation circuits. The isolation devices should meet the same design criteria as the instrument loop being isolated. RG&E states that there may be no isolation between post-accident instrumentation and other uses, such as controllers and alarms. RG&E has not provided details, described the circuits without isolation devices, or given justification for not providing the isolation recommended by the regulatory guide. RG&E should identify and provide justification for any Category 1 or Category 2 instruments that interface with instrumentation or control circuits that have less stringent design criteria.

16. Commitment to R.G. 1.97

Generic Letter No. 82-33 (NUREG-0737, Supplement No. 1) recommends that licensees and applicants document how they meet the recommendations of R.G. 1.97. The generic letter also recommends that licensees and applicants explicitly show deviations from the guidance in R.G. 1.97 and to present supporting justification or alternatives. In lieu of a commitment to R.G. 1.97, RG&E has provided a comparison of existing instrumentation attributes with the criteria provided in R.G. 1.97. RG&E has made no commitments concerning the R.G. 1.97 criteria for future post-accident instrumentation modifications.

RG&E's design predates the R.G. 1.75 separation criteria, thus not all modifications can fully comply with the redundancy and separation criteria of R.G. 1.97. RG&E should describe constraints on separation that the licensee will adhere to for future modifications of R.G. 1.97 instrumentation. RG&E should detail plans for a commitment to R.G. 1.97 addressing redundancy, separation, and any other criteria not in full conformance with R.G. 1.97, as they apply to future design changes.