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 MECREDDY, R.C.      Rochester Gas & Electric Corp.  
 RECIP. NAME      RECIPIENT AFFILIATION  
 VISSING, G.S.

SUBJECT: Application for amend to license DPR-18 to revise ITS associated with RCS leakage detection instrumentation. LAR proposed as result of commitment that RG&E submit as part of staff review of application of leak-before-break status.

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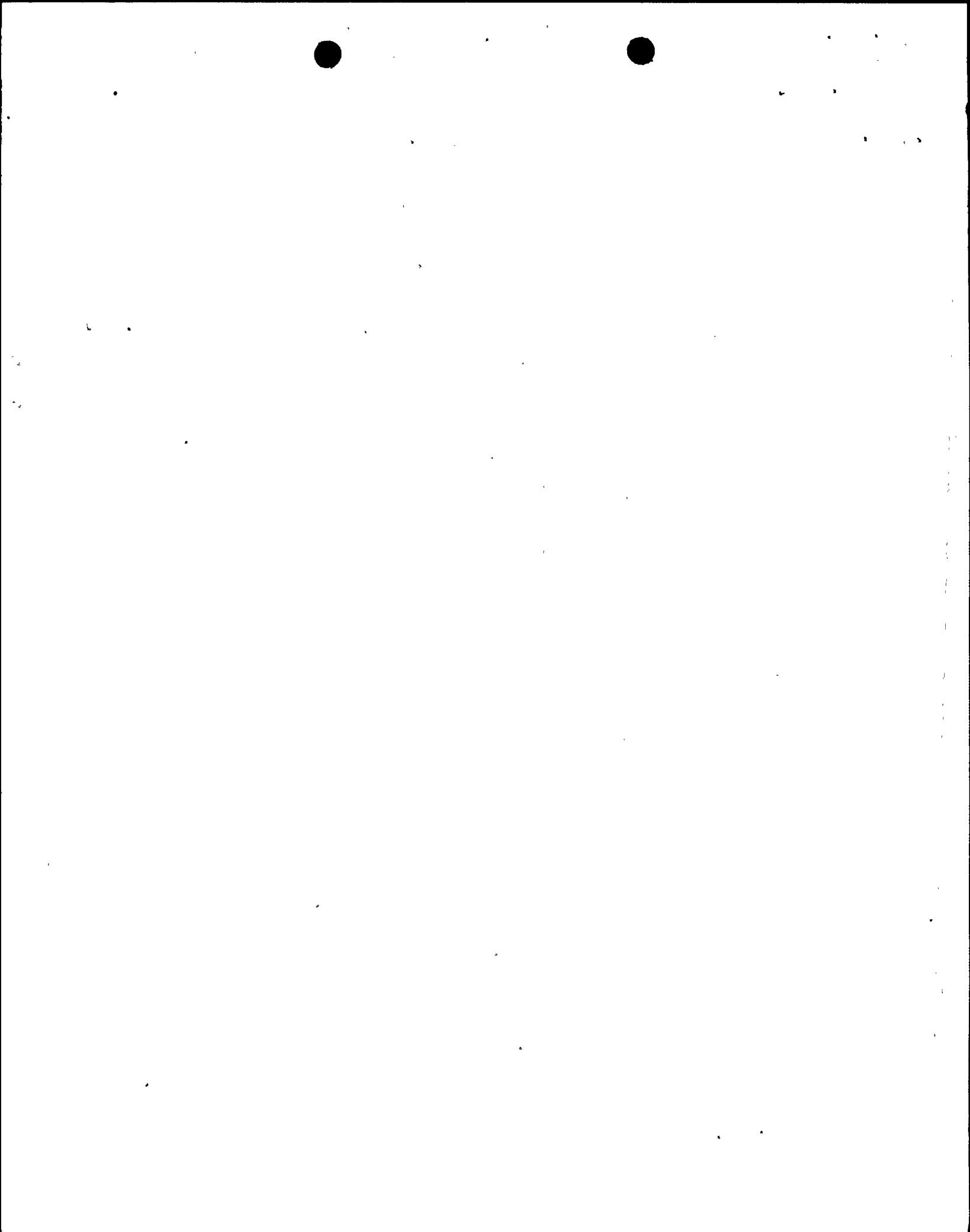
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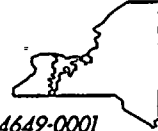
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ROBERT C. MECREDDY  
Vice President  
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June 28, 1999

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Attn: Guy S. Vissing  
Project Directorate I-1  
Washington, D.C. 20555

Subject: Application for Amendment to Facility Operating License  
Reactor Coolant System Leakage Detection  
Instrumentation Change (LCO 3.4.15)  
Rochester Gas and Electric Corporation  
R.E. Ginna Nuclear Power Plant  
Docket No. 50-244

- References:
1. Letter from Robert C. Mecreddy (RG&E) to Guy S. Vissing (NRC), "Proposed Changes to the Requirements for Compensatory Controls for Ginna's Leak Detection System to Support Leak-Before-Break (LBB) Application of Portions of Ginna Residual Heat Removal (RHR) System", dated December 7, 1998.
  2. Letter from Guy S. Vissing (NRC) to Robert C. Mecreddy (RG&E), "Staff Review of the Submittal by Rochester Gas and Electric Company to Apply Leak-Before-Break Status to Portions of the R.E. Ginna Nuclear Power Plant Residual Heat Removal System Piping", dated February 25, 1999.

Dear Mr. Vissing:

The enclosed License Amendment Request (LAR) proposes to revise the Ginna Station Improved Technical Specifications associated with the Reactor Coolant System (RCS) Leakage Detection Instrumentation (LCO 3.4.15).

The LAR is being proposed as the result of a commitment that Rochester Gas and Electric (RG&E) submitted as part of the staff review of the RG&E application of leak-before-break status to portions of the residual heat removal system piping (References 1 and 2). This commitment was to increase the compensatory actions that would be taken when the particulate containment atmosphere radioactivity monitor (R-11) is inoperable.

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P PDR

RG&E requests that upon NRC approval, this LAR should be effective immediately and implemented within 30 days.

Very truly yours,

  
Robert C. Mecredy

Attachments

xc: Mr. Guy S. Vissing (Mail Stop 8C2),  
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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )  
 )  
Rochester Gas and Electric Corporation ) Docket No. 50-244  
(R.E. Ginna Nuclear Power Plant) )

**APPLICATION FOR AMENDMENT  
TO OPERATING LICENSE**

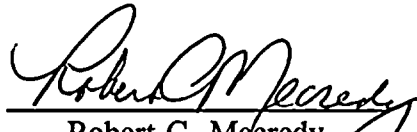
Pursuant to Section 50.90 of the regulations of the U.S. Nuclear Regulatory Commission (the "Commission"), Rochester Gas and Electric Corporation ("RG&E"), holder of Facility Operating License No. DPR-18, hereby requests that the Improved Technical Specifications set forth in Appendix A to that license be amended. This request for change in Improved Technical Specifications is to revise the Reactor Coolant System (RCS) Leakage Detection Instrumentation (LCO 3.4.15) requirements to increase the compensatory actions when the particulate containment atmosphere radioactivity monitor is inoperable.

A description of the amendment request, necessary background information, justification of the requested changes, and environmental impact considerations determination are provided in Attachment I. The no significant hazards consideration evaluation is provided as Attachment II. A marked up copy of the current Ginna Station Improved Technical Specifications which shows the requested changes is set forth in Attachment III. The proposed revised Improved Technical Specifications are provided in Attachment IV.

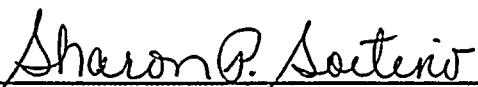
The evaluation set forth in Attachment I demonstrates that the proposed changes do not involve a significant change in the types or a significant increase in the amounts of effluent or any change in the authorized power level of the facility. The proposed changes also do not involve a significant hazards consideration, as documented in Attachment II.

WHEREFORE, Applicant respectfully requests that Appendix A to Facility Operating License No. DPR-18 be amended in the form attached hereto as Attachment IV.

Rochester Gas and Electric Corporation

By   
Robert C. Mecredy  
Vice President  
Nuclear Operations Group

Subscribed and sworn to before me  
on this 28th day of June, 1999.

  
Notary Public

SHARON P. SORTINO  
Notary Public, State of New York  
Registration No. 01S06017755  
Monroe County  
Commission Expires December 21, 2000

**Attachment I**  
**R.E. Ginna Nuclear Power Plant**

**LICENSE AMENDMENT REQUEST**  
**REACTOR COOLANT SYSTEM LEAKAGE DETECTION**  
**INSTRUMENTATION CHANGE**

This attachment provides a description of the amendment request and necessary justification for the proposed changes. The attachment is divided into five sections as follows. Section A identifies all changes to the current Ginna Station Improved Technical Specifications (ITS) while Section B provides the background and history associated with the changes being requested. Section C provides detailed justification for the proposed changes. An environmental impact consideration of the requested changes is provided in Section D. Section E lists all references used in Attachments I and II.

**A. DESCRIPTION OF AMENDMENT REQUEST**

This License Amendment Request (LAR) proposes to revise Ginna Station ITS to reflect the commitment to increase the compensatory actions associated with the reactor coolant system (RCS) leakage detection instrumentation. The change is summarized below and shown in Attachments III and IV.

1. LCO 3.4.15
  - a. The LCO will be revised to require both the gaseous (R-12) and the particulate (R-11) containment atmosphere radioactivity monitors during the modes of applicability.
  - b. The required actions associated with the inoperability of the containment atmosphere radioactivity monitors will be revised to include a requirement for the use of alternate methods to determine the RCS leak rate when the particulate (R-11) containment atmosphere radioactivity monitor is inoperable.

## B. BACKGROUND

In November 1997 Rochester Gas and Electric (RG&E) requested (Reference 1) that the NRC review and approve an application to remove consideration of the dynamic effects of postulated ruptures of portions of the Ginna residual heat removal (RHR) system piping from the licensing basis. RG&E submitted a leak-before-break (LBB) analysis prepared by Structural Integrity Associates (SIA) for the subject portions of the RHR system piping. LBB evaluations developed using the analysis methodology contained in NUREG-1061, Volume 3, "Report of the U.S. Nuclear Regulatory Commission Piping Review Committee, Evaluation of Potential for Pipe Breaks," have been previously approved by the Commission as demonstration of an extremely low probability of piping system rupture. This methodology determines a piping flaw size that would provide early indication of a leak to allow operators to shutdown and depressurize the primary system before piping stresses would result in a catastrophic large break of the pipe. Having established the acceptable leakage flow size from applying the appropriate factor of safety to the critical flaw size, the RG&E/SIA analysis then determined the leakage behavior of the postulated leakage flaw. The RG&E/SIA analysis determined that the acceptable leakage flow at the hot leg provided the minimum amount of leakage of 4.7 gallons per minute (gpm), while the acceptable leakage flow at the cold leg provided that leg's minimum leakage of 13.5 gpm. The RG&E/SIA analysis concluded that these leakage rates were detectable since the installed Ginna leakage detection system was capable of detecting 1 gpm of leakage (consistent with NRC Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," guidance). Therefore, RG&E concluded that the LBB behavior of this line had been demonstrated.

The NRC staff performed a separate analysis and then compared the critical flaw at the bounding location to the leakage flaw which provided 10 gpm of leakage under normal operating pressure conditions to determine whether the margin of 2 defined in NUREG-1061, Vol. 3 was achieved. The 10 gpm value was defined by noting that the compliance of the Ginna containment leakage detection system with the position in Regulatory Guide 1.45 indicates that this system would be able to detect a 1 gpm leak in the course of 1 hour. A factor of 10 is applied to this 1 gpm detection capability to account for thermohydraulic uncertainties in calculating the leakage through small cracks, in addition to the margin of 2 required for the critical flaw size. The amount of leakage from the flaw which was one-half the size of the critical flaw size was determined by the staff to be only 2.75 gpm. Since the sensitivity of the Ginna leakage detection system was specified as 1 gpm, the margin on the leakage would be only 2.75 instead of the factor of 10 required in the guidance of NUREG-1061, Vol. 3. Although, in previous LBB evaluations, the staff had concluded that margins of slightly less than 2 on the critical-to-leakage flaw size are acceptable provided that a full margin of 10 is maintained on the leakage uncertainty, deviations of this magnitude are not acceptable. The NUREG-1061, Vol. 3 does provide guidance, however, for licensees demonstrating leakage detection capabilities of less than 1 gpm.



RG&E subsequently provided information to the staff to support the conclusion that less than 1 gpm of leakage could be detected by the Ginna containment monitoring system. Radioactivity detection systems at Ginna are included for monitoring both particulate and gaseous activities because of their sensitivities and rapid responses to reactor coolant system (RCS) leakage. Section 5.2.5 of the Ginna Updated Final Safety Analysis Report states that the containment atmosphere particulate radioactivity monitor, R-11, is the most sensitive instrument available for detection of RCS leakage in containment. Assuming a complete dispersion of leaking radioactive solids consistent with very little or no fuel cladding leakage, R-11, is capable of detecting leaks as small as approximately 0.013 gpm within 20 minutes. Even if only 10% of the particulate activity is actually dispersed, a leakage rate on the order of 0.13 gpm within 1 hour is well within the detectable range of R-11, which is much lower than the minimum leakage detection requirement at Ginna. The containment gaseous monitor, R-12, is much less sensitive, but can detect a leak of 2.0 to 10.0 gpm within 1 hour and is considered to be a backup to the particulate monitor. The containment sump level can measure approximately a 2.0 gpm leak within 1 hour. Operability of these monitors is addressed in ITS LCO 3.4.15. Alternative means also exist to monitor RCS leakage inside containment, which include humidity detectors, air temperature and pressure monitoring, and condensate flow rate from the air coolers.

The staff requested that RG&E provide data based on past experience to demonstrate the capability of the containment air particulate monitor to detect such small leakages. RG&E subsequently provided information detailing a leakage detection event that occurred on August 19, 1998, which involved R-11. The event began when operations personnel noted an upward trend on their R-11 response. Background readings for R-11 had varied from 90 cpm to 120 cpm, but within a few hours, the count rate increased and stabilized at 150 cpm to 200 cpm. RG&E's analysis of a containment air sample showed radioisotopes of the types Na-24, Mo-99, and I-133, with a total concentration of 2.0E-11 uCi/cc. The operators later pinpointed the leak at a vent connection on the letdown piping with a 2" nominal diameter. The leak was estimated to be between 0.05 gpm and 0.10 gpm. There have been other instances in the past where the R-11 detector has indicated higher count rates and has triggered a search using walkdowns or noting liquid inventory changes of the RCS make-up system. The capability of these systems to detect RCS leakage is influenced by several factors including the containment free volume and detector location. The capability to detect a low leakage of 0.013 gpm for the R-11 detector is attributed to Ginna's relatively small containment volume of approximately 970,000 cubic feet, effective recirculation of air inside the containment, and use of a second generation R-11 detector that was installed in 1986.

The staff also questioned RG&E about the availability of the R-11 monitor based on past experience. As documented in a letter dated December 7, 1998 (Reference 2), RG&E reviewed the inoperable equipment control records for R-11 and found the percentage of time that R-11 was operable for a given year, as follows: 1995 - 97%, 1996 - 98%, 1997 - 92%, and 1998 (to December 7, 1998) - 97%. Ginna's current ITS require an RCS water inventory balance every 72 hours under normal conditions or every 24 hours under certain conditions when containment leakage detection system components are inoperable. Based on the importance of early RCS leakage detection to the leak-before-break methodology, RG&E committed to increase the frequency of the RCS water inventory balance when R-11 is unavailable. A requirement was added to the Ginna Technical Requirements Manual (TRM) on December 18, 1998 to require either an RCS water inventory balance or analyses of containment atmosphere grab samples be performed once within 12 hours and every 12 hours thereafter when R-11 is unavailable while in Modes 1, 2, 3, and 4. Also, RG&E committed to submit a license amendment request (LAR) to revise Ginna's ITS to require either an RCS water inventory balance or analyses of containment atmosphere grab samples once within 12 hours and every 12 hours thereafter when monitor R-11 is unavailable while in Modes 1, 2, 3, and 4. Based on the data from the leakage detection event that occurred on August 19, 1998, the relatively small containment free volume, and the effective recirculation of air inside the containment, the staff concluded that the containment air particulate monitor at Ginna is capable of detecting less than 1 gpm within an hour as recommended in Regulatory Guide 1.45 and for the purposes of the leak-before-break (LBB) evaluation, the licensee has demonstrated their ability to detect less than 0.25 gpm within 1 hour. The staff accepted that the acceptable leakage flaw size may therefore be defined (to maintain the margin of 10 on leakage) as the flaw which provides 2.5 gpm of leakage under normal operating conditions.

Based on the information and analysis supplied by RG&E, the staff was able to independently assess the LBB status of the analyzed portions of the Ginna RHR system piping. The staff concluded (Reference 3) that the analysis submitted by RG&E, including the information supporting a Ginna leakage detection system capability of less than 1 gpm, was sufficient to demonstrate that LBB behavior would be expected from the subject piping.

## C. JUSTIFICATION OF CHANGES

This section provides the justification for all changes described in Section A above and shown on Attachment IV. The justifications are organized based on whether the change is: more restrictive (M), less restrictive (L), administrative (A), or the requirement is relocated (R). The justifications listed below are also referenced in the technical specification(s) which are affected (see Attachment III).

### C.1 More Restrictive

- M.1 The required RCS leakage detection instrumentation by LCO 3.4.15 will be revised to require both the gaseous (R-12) and the particulate (R-11) containment atmosphere radioactivity monitors during the modes of applicability, where currently only one monitor is required. This change is due to the sensitivity of the particulate monitor and the ability to detect small amounts of leakage to support LBB. The proposed new LCO will provide a higher assurance of the ability to detect RCS leakage and is more conservative than the guidance of NUREG-1431.
- M.2 The current Required Actions associated with the inoperability of the containment atmosphere radioactivity monitors (Conditions B and C) will be revised to reflect the enhanced compensatory actions required, while in MODES 1, 2, 3, and 4. A new Condition B will require a verification of the status of the particulate monitor (R-11) within 1 hour when the gaseous monitor (R-12) is inoperable. This change will provide assurance that an adequate method of leak detection is available. The current Condition B for both radiation monitors being inoperable and Required Action B.2 to restore one monitor within 30 days will be moved to the new Condition D and Required Actions D.1 and D.2. When the particulate monitor (R-11) is unavailable, new Condition C will require either a RCS water inventory balance or analyses of containment atmosphere grab samples be performed once within 12 hours and every 12 hours thereafter per Required Actions C.1 and C.2. This is more conservative than the current Required Actions B.1.1, B.1.2, C.1.1, and C.1.2 which have a 24 hour frequency. Performance of either of these alternate methods will provide increased information that is adequate to detect leakage. The current Required Actions (B and C) do not provide for compensatory measures when the particulate monitor (R-11) is inoperable unless the gaseous monitor (R-12) or the containment sump A monitor are also inoperable concurrently. The current Required Action C.2.1 for restoring the required containment sump monitor to operable status within 30 days is being deleted as it is redundant to Required Action A.2. The proposed new Required Actions and frequencies will provide a higher assurance of the ability to detect RCS leakage and are more conservative than the guidance of NUREG-1431.

- M.3 The Surveillance Requirements (SR 3.4.15.1, SR 3.4.15.2, and SR 3.4.15.4) will be revised consistent with the change to the LCO such that the surveillances are required for both the gaseous (R-12) and the particulate (R-11) containment atmosphere radioactivity monitors. This change ensures that there is reasonable confidence that both of the channels are operating properly and can perform their function in the desired manner.

There are no less restrictive (L), administrative (A), or relocated (R) changes associated with this LAR.

#### D. ENVIRONMENTAL IMPACT CONSIDERATION

RG&E has evaluated the proposed changes and determined that:

1. The changes do not involve a significant hazards consideration as documented in Attachment II; and
2. The changes do not involve a significant change in the types or significant increase in the amounts of any effluent that may be released offsite since no specifications related to offsite releases are affected; and
3. The changes do not involve a significant increase in individual or cumulative occupational radiation exposure since no new or different type of equipment are required to be installed as a result of this LAR.

Accordingly, the proposed changes meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed changes is not required.

#### E. REFERENCES

1. Letter from Robert C. Mecredy (RG&E) to Guy S. Vissing (NRC), "Rochester Gas and Electric Corporation's 50-244/97-201-03 Inspection Report", dated November 11, 1997.
2. Letter from Robert C. Mecredy (RG&E) to Guy S. Vissing (NRC), "Proposed Changes to the Requirements for Compensatory Controls for Ginna's Leak Detection System to Support Leak-Before-Break (LBB) Application of Portions of Ginna Residual Heat Removal (RHR) System", dated December 7, 1998.

3. Letter from Guy S. Vissing (NRC) to Robert C. Mecredy (RG&E), "Staff Review of the Submittal by Rochester Gas and Electric Company to Apply Leak-Before-Break Status to Portions of the R.E. Ginna Nuclear Power Plant Residual Heat Removal System Piping", dated February 25, 1999.
4. NUREG-1431 Rev.1, Standard Technical Specifications for Westinghouse Plants

**Attachment II**  
**R.E. Ginna Nuclear Power Plant**

**SIGNIFICANT HAZARDS CONSIDERATION EVALUATION**

The proposed changes to the Ginna Station Improved Technical Specifications as identified in Attachment I Section A and justified by Section C have been evaluated with respect to 10 CFR 50.92(c) and shown not to involve a significant hazards consideration as described below. This attachment is organized based on Attachment I Section C.

**Evaluation of More Restrictive Changes**

The more restrictive changes associated with the reactor coolant system (RCS) leakage detection instrumentation, to require both the gaseous and the particulate containment atmosphere radioactivity monitors to be operable and amending the compensatory actions associated with the inoperability of the monitors do not involve a significant hazards consideration as discussed below:

- 1) Operation of Ginna Station in accordance with the proposed changes does not involve a significant increase in the probability or consequences of an accident previously evaluated. The changes add further requirements for redundancy and a requirement to perform either an RCS water inventory balance or analyses of containment atmosphere grab samples once within 12 hours and every 12 hours thereafter when the particulate containment atmosphere radioactivity monitor is unavailable while in Modes 1, 2, 3, and 4. This does not increase the probability of an accident previously evaluated since the compensatory actions are either a calculation utilizing installed indication or the measurement of a sample drawn downstream from the containment atmosphere sample isolation valves and are of themselves not an accident initiator. The proposed compensatory actions are based on the NUREG-1431 guidance and the proposed frequencies are more conservative, which gives a higher assurance that the RCS leakage rate can be adequately monitored. Therefore, the probability or consequences of an accident previously evaluated is not significantly increased.
  
- 2) Operation of Ginna Station in accordance with the proposed changes does not create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed changes add further requirements for redundancy and the proposed change for compensatory actions when the particulate containment atmosphere radioactivity monitor is inoperable does not of itself involve a physical alteration of the plant (ie. no new or different type of equipment will be added to perform the required actions) or changes in the methods governing normal plant operation. The changes only involve implementing currently approved alternate methods to determine the RCS leak rate on an increased frequency. Therefore, the possibility for a new or different kind of accident from any accident previously evaluated is not created.

- 3) Operation of Ginna Station in accordance with the proposed changes does not involve a significant reduction in a margin of safety. The proposed changes only add conservatism in the number of required RCS leakage detection instrumentation and add more conservative compensatory actions that are to be taken when the containment atmosphere particulate radioactivity monitor is inoperable. The compensatory actions are based on the guidance of NUREG-1431. Therefore, this change does not involve a significant reduction in a margin of safety.

Based upon the preceding information, it has been determined that the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated, create the possibility of a new or different kind of accident from any accident previously evaluated, or involve a significant reduction in a margin of safety. Therefore, it is concluded that the proposed changes meets the requirements of 10 CFR 50.92(c) and do not involve a significant hazards consideration.