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SUBJECT: Comments on proposed rule re generic issue 23 concerning reactor coolant pump seal failure.

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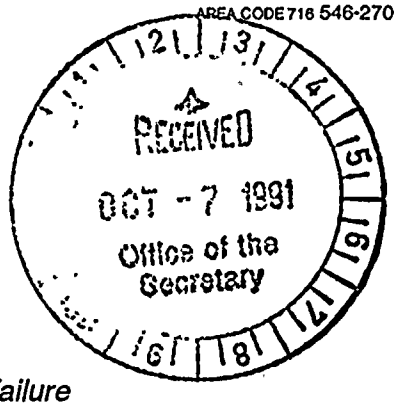

September 27, 1991

Mr. Samuel J. Chilk, Secretary of the Commission
United States Nuclear Regulatory Commission
Attn: Docketing & Services Branch
Washington, DC 20555

Subject: Generic Issue 23, *Reactor Coolant Pump Seal Failure*
R. E. Ginna Nuclear Power Plant
Docket Number 50-244

References: *Solicitation of Public Comments On Generic Issue 23, 'Reactor Coolant Pump Seal Failure'; and, Draft Regulatory Guide: Issuance, Availability*, 56 FR 16130, April 19, 1991

Dear Mr. Chilk,

Rochester Gas & Electric Corporation would like to take this opportunity to provide the attached responses to questions on NRC Generic Issue 23 posed by the Staff in the referenced Federal Register Notice. We hope that our responses may be of some help in shaping the final resolution of GI-23.

Very truly yours,

Robert C. Mecredy

Robert C. Mecredy

xc: Mr. Allen R. Johnson (Mail Stop 14D1)
Project Directorate I-3
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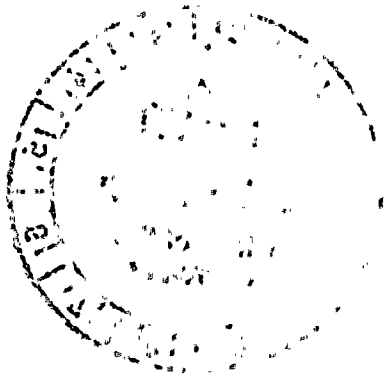
Washington, DC 20555

Ginna Senior Resident Inspector



1. *The priority for the resolution of Generic Issue 23 was originally based on the number and magnitude of seal leaks that occurred prior to 1983, The failure rate appeared to exceed the assumptions made for the WASH-1400 study for small loss of coolant accidents by an order of magnitude. There appears to be some evidence that RCP seal operating experience has since improved, at least in the magnitude of leakage from seal failures. The NRC is seeking data to determine if this is the case and whether the apparent improvement is applicable to all RCP seal, to those from specific manufacturers, or to those that had particular quality assurance provisions applied during design, installation, operation, and maintenance.*

   1.1 *Has your operating experience with the RCP seals changed since 1983? If it has, then information regarding the history of RCP failures, including occurrences of forced outages is of interest. Information regarding all types of operation, including startup, is desired.*

   RG&E Response: RG&E has experienced improvements in RCP seal operating reliability since 1983. Based on the observed operating reliability of our RCP seal packages, RG&E started a program in 1986 to increase our major seal inspection interval from 24 months to 36 months. Inspection of RCP PRC01B after a 36 month period (1987-1990) showed excellent wear characteristics. More recently, a 36 month inspection of RCP PRC01A (1988-1991) also showed excellent wear characteristics.

   1.2 If your operating experience has changed, to what do you attribute the change (e.g., improved quality assurance and quality control, improved maintenance, better procedures, improved instrumentation, design changes)?

   RG&E Response: RG&E believes improved seal materials have helped in establishing improved wear characteristics. Examples of this include:

   1) The #1 and #2 seal inserts were changed to chrome carbide inserts to allow for longer usage between replacement; and,

   2) "O" ring durometer changes to the #2 seal delta channel seal "O" ring have eliminated hangup problems on the #2 seal ring that had been troublesome.

1.3 How often are seals being routinely replaced (e.g., every refueling)?

RG&E Response: RG&E presently inspects its RCP seals on a 36 month frequency. It is not our policy to routinely replace the seal components. RG&E replaces seal components based on inspection results and the manufacturer's acceptance criteria. These criteria are captured in Ginna procedures.

2. *The NRC staff is interested in obtaining any available data regarding degraded cooling or loss of cooling to the seals to support assertions that seals can survive long periods of time (i.e., hours) without cooling.*

RG&E Response: Ginna has not experienced either degradation or a total loss of cooling to its RCP seals. RG&E has upgraded RCP PRC01A to the new, high-temperature "O" ring material. RCP PRC01B currently has #1 seals with the new silicon nitride face plates. Under current plans, both RCPs will have silicon nitride face plate material in the #1 seal ring and runner assemblies and be converted to the new, high-temperature "O" ring material following their current inspection periods. These are the materials recommended by Westinghouse to prevent major RCP seal damage following a total loss of RCP cooling event, such as a station blackout.

3. *The staff acknowledges that procedures related to the operation of the seals play an important role in avoiding a small break LOCA caused by seal failure. It is not clear that past and current treatment of the seals reflect their safety importance. The NRC staff is therefore considering the need for improvements in the related procedures, training and information provided to operators and their actions.*

3.1 Are there procedures currently in place that are intended to prevent seal leaks from becoming small break LOCAs during both normal plant operation and loss of seal cooling events such as station blackout? Are the required operator actions (e.g., isolating leakoff lines) the same for normal plant operation and loss of seal cooling events?

RG&E Response: Ginna Procedure AP-RCP.1, *RCP Seal Malfunction*, directs the operators to close the #1 seal outlet valve for any pump that exhibits indications of a #1 seal failure. Ginna Procedure ECA-0.0, *Loss Of All AC Power*, directs the operators to isolate RCP seal injection and return valves to minimize the effects of increased seal leakage during a station blackout scenario.

The required operator actions are the same for normal plant operation and emergencies such as loss of seal cooling events.

3.2 Has the RCP instrumentation been evaluated to determine whether operators have sufficient information to implement the procedures?

RG&E Response: RG&E has examined our existing RCP instrumentation and procedures; we believe that sufficient instrumentation is currently installed to allow operators to diagnose and respond to RCP seal problems using Ginna abnormal and emergency procedures.

3.3 How is RCP seal vendor information used in establishing operation and maintenance practices for the RCP seals?

RG&E Response: Ginna RCP operating procedures are based on Westinghouse RCP vendor manual guidance. Procedures are updated as updated vendor manual information is received by RG&E.

3.4 In some cases, industry practice allows continued plant operation with the RCP seal when first or second stages have failed. Do you limit this practice? If so, what are the limiting conditions?

RG&E Response: Ginna procedures require the seal outlet valve to be closed and the RCP to be stopped within 30 minutes if the #1 seal indicated a leak rate of more than 5.5 gpm, or if the seal outlet temperature exceeds 215 °F. Continued operation is allowed following failure of a #2 seal, with requirements for increased surveillance of pump operating parameters.

3.5 What additional quality assurance and procedural measures can be taken regarding RCP seals to improve safety?

RG&E Response: RG&E does not have any further recommendations to make at this time.

4. *As part of the probabilistic risk assessment performed for GI-23, a seal model (appendix A of NUREG/CR-5167) was developed for use in estimating the core damage frequency associated with loss of RCP seal cooling.*

   4.1 *Is the staff's model, or other models, adequate to predict RCP seal leakage (i.e., models of seal failure, time-dependant failure probability, and leakage estimates) and handle the uncertainties in the models? Do the models correlate to actual plant or test data?*

   RG&E Response: There are two key factors to consider in determining RCP seal failure probabilities: Frequency of loss of cooling to the seals, and performance of the seal materials following degraded or (to assume the worst case) or complete losses of cooling. As was stated in our response to Question 2, Ginna has not experienced any degradation or loss of cooling to its RCP seals. Therefore, we have no basis to compare the NRC's model predictions to actual plant data for either loss of cooling, or performance of the seal materials following a loss of cooling. Ginna-specific probabilistic models for loss of cooling to the RCP seals, which are being developed as part of RG&E's response to NRC Generic Letter 88-20 have not, as of this date, been quantified. The Ginna PRA Project currently plans to use Westinghouse Owners Group data to model the behavior of the RCP seal materials following a complete loss of cooling.

   4.2 *Of particular interest to the staff are alternatives to the probabilistic RCP seal leakage model developed for Westinghouse seals and alternative models for other seal designs (i.e., for seals by Byron-Jackson, Bingham International, or Combustion Engineering/KSB) to predict seal leakage during loss of all seal cooling events. Can you provide information regarding any alternative models?*

   RG&E Response: RG&E has no information on alternative probabilistic RCP seal leakage models for other than Westinghouse RCP seals.

5. *In exploring alternative to providing additional seal cooling, one approach might be to test the existing seals to demonstrate conclusively that they will not leak excessively if not cooled for extended periods of time., even though such conditions exceed the seal design basis and possibly the conditions of the warranty. If testing was an option to demonstrate acceptable seal performance under loss of cooling conditions, what conservative conditions should be imposed on the RCP seal for the test program (e.g., length of time, maximum wear on seal, number of tests)?*

   RG&E Response: RG&E has co-sponsored Atomic Energy of Canada Limited's (ACEL's) testing of RCP seal assemblies as a member of the Westinghouse Owners Group. Results and other information from this program have been provided to the NRC Staff; differences between this data and data championed by the Staff in the proposed resolution of GI-23 have been the subject of intense debate for a number of years. RG&E can add nothing further to this debate at this time, other than to state that it stands behind the work of the Westinghouse Owners Group.

6. *If, after consideration of public comments, the NRC decides that additional RCP seal requirements are necessary, what method of imposition should be used (e.g., by rulemaking, orders, or generic letter)?*

   RG&E Response: RG&E believes that rulemaking and proper application of 10 CFR §50.109 is the proper vehicle for the NRC to impose any new requirements on licensees.