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 CRUTCHFIELD, D. Operating Reactors Branch 5

SUBJECT: Forwards comments on NRC 801114 safe shutdown evaluation re
 SEP Topics V-10.B, V-11.A, V-11.B, VII-3 & IX-3. Integrated
 approach of evaluation achieved comprehensive review.

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LECTURE NOTES

BY

ROBERT R. WATSON

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CHICAGO, ILLINOIS

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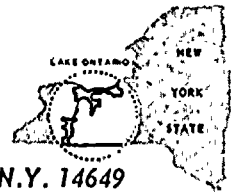
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JOHN E. MAIER
VICE PRESIDENT

TELEPHONE
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January 13, 1981

Director of Nuclear Reactor Regulation
Attention: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: SEP Topics V-10.B, V-11.A, V-11.B, VII-3, IX-3
(Safe Shutdown Systems)
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Crutchfield:

Enclosed are the Rochester Gas and Electric responses to the NRC's Safe Shutdown Evaluation, dated November 14, 1980. We believe that the integrated approach used to perform this evaluation achieved a much higher level of comprehensive review than the piecemeal approach used for most of the previous SEP assessments. It is somewhat unclear, however, how this integrated review is to be used in light of other assessments of the same topics recently received by RG&E. A means is needed to establish which assessments of identical topics should take precedence, and how partial topic evaluations (such as IX-3 and X) are to be factored into the final topic assessment. At the present time, it is difficult to determine if a topic assessment is ever complete.

The enclosed comments should be considered by the NRC before a final assessment of these topics are made.

Very truly yours,

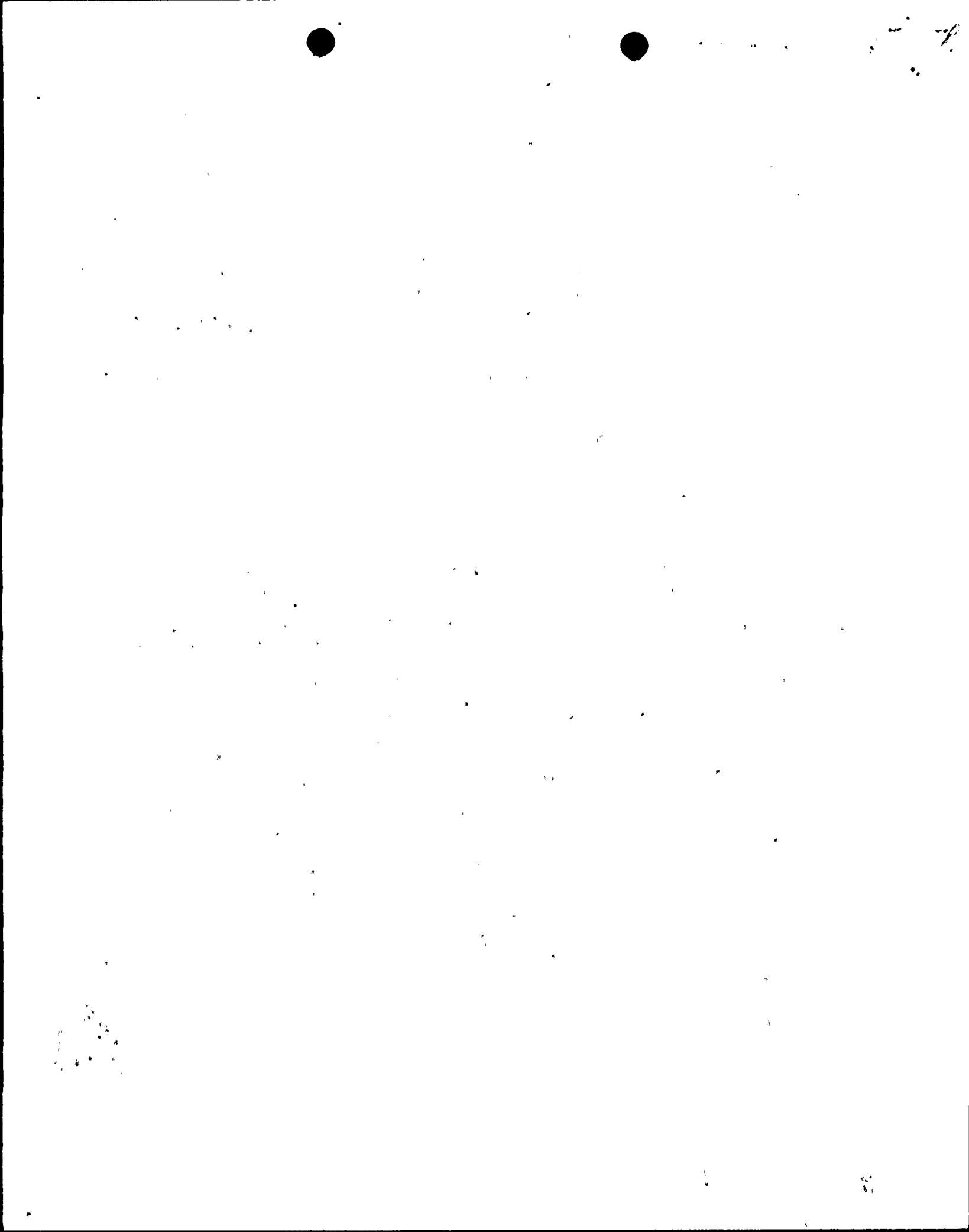
J. E. Maier

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Enclosure - RG&E Comments on the "Safe
Shutdown Evaluation - November 14, 1980

1. On page 5, Piping System Passive Failures, the NRC assumes piping system passive failures "...beyond those normally postulated by the staff, e.g., the catastrophic failure of moderate energy systems...". Although it is shown that safe shutdown following such an event could be achieved, it is not considered that such an evaluation should even be made. As noted by the staff, it is clearly beyond a reasonable design basis. It is thus recommended that this paragraph be deleted from the evaluation. Subsequent evaluations to this "criterion", such as those related to the CCW system on page 22 and 23, should also be deleted.
2. On page 8, second paragraph, it is noted that, during cool-down, the overpressure protection system is put in service and one charging pump is removed from service to minimize the potential for any overpressure event during RHR operation. This description is not entirely correct.

Technical Specifications 3.3.1.3, 3.15 and 3.15.1 state that the overpressure protection system must be operable when RCS cold leg temperature is $< 330^{\circ}\text{F}$. At that point, no more than one safety injection pump shall be operable.

3. On page 12, Branch Technical Position RSB 5-1 is taken as the current licensing criteria. It would appear that this guidance should have been superseded by the issuance of Regulatory Guide 1.139.
4. Table 3.1, Classification of Shutdown Systems - R.E. Ginna Plant, has not been reviewed in detail. Comments will be provided in conjunction with our review of SEP Topic III-1, "Classification of Structures, Components, and Systems."
5. With regard to Section 4.2, "Pressure Relief Requirements," it should be stated that the Ginna Overpressure Protection System was approved by the NRC via Technical Specification Amendment No. 26 (April 18, 1979).
6. At the bottom of p. 51, it is stated that the reason 300°F was chosen was because the data could only be reasonably extrapolated to 300°F . A more basic reason for choosing 300°F is that, above 300°F , the RCS-to-SG temperature difference would be less than 50°F . Lesser ΔT 's considerably reduce the overpressure effects of heat input transients.
7. At the top of page 52, it is stated that the pressure would not exceed 100% of RHR design pressure even assuming the failure of one PORV. It should be added that, for additional margin, no credit is given for the RHR relief valve (RV 203).



11

8. In Section 5.1, it is recommended that RG&E have procedures for shutdown and cooldown (1) using safety-grade systems only, and (2) from outside the control room. We do not believe that the former procedure would be beneficial.

Cooldown to cold shutdown can be performed using safety-grade or non-safety grade systems. It is not to be performed in haste, but would be effected over the course of many hours (or even days). The operators will perform this cooldown with the equipment available to them. If a piece of non-safety equipment is available, and would be the most beneficial for performing a required function, it is expected that this piece of equipment would be used. If it is not available, the operator could fall back on the use of safety-grade equipment. But RG&E does not intend to commit plant personnel to use only safety-related equipment, if non-safety equipment is available and more effective. We feel that it would be impossible to determine when a "safety-grade-only" cooldown procedure would ever be implemented. As long as the safety-grade equipment is available (and the safe shutdown assessment concludes that it is), RG&E considers that the necessary safety requirements are met.

As for the latter procedure: Although it is certainly not expected that an event requiring cold shutdown from outside the main control room would ever be required, the capability is explicitly required by General Design Criterion 19. RG&E will thus consider developing such a procedure during the SEP integrated assessment, as suggested in Section 4.5. System and structural modifications being conducted at this time, as well as near-future system evaluations to be conducted, (such as fire protection and seismic and environmental qualification), will affect system design and arrangement to the point of making it impractical to generate the procedure at this time.

9. In section 5.2, the NRC requests that RG&E: a.1) install interlocks on the LPSI power-operated valves to prevent opening until RCS pressure is below RHR design pressure, a.2) install independent diverse interlocks on the RHR isolation valves to prevent the valves from opening unless RCS pressure is below RHR system design pressure, and b) incorporate a plant Technical Specification to require enabling the Overpressure Protection System wherever RHR cooling is in progress.

Recommendations a.1) and a.2) have been addressed in response to the NRC assessment of SEP Topic V-11.B, "RHR Interlocks", by RG&E letter dated January 8, 1980. For completeness, the responses will be repeated here:

- a.1) Although the LPSI isolation valves (MOV 852 A and B) open on an SI signal before the RCS pressure drops below RHR design pressure, the check valves in these lines would ensure that the RHR system would not become



overpressurized. In response to questions regarding the "Event V" check valve configurations, RG&E had committed, by letter dated March 14, 1980, to develop a periodic check valve pressure integrity test program, to be used during startups prior to exceeding the RHR system design pressure. This procedure has been developed, and is included in the Ginna Startup Procedure. Based on the implementation of this testing program, it is considered that sufficient assurance exists that these checks valves will be closed, and perform their isolation function, until RCS pressure decreases below the RHR system pressure.

A significant disadvantage of an interlock on RCS pressure for MOVs 852A and B is that valve opening could be significantly delayed in the event of a small break loss of coolant accident due to the gradual depressurization of the primary system. Because MOVs 852A and B are located in the containment basement with the valve operators being approximately 45 inches and 43 inches, respectively, above the basement floor, it is possible that, with an interlock system in place, the valves would be flooded and potentially inoperable prior to receiving an opening signal. With the present logic for opening the valve, such failures due to flooding are not possible. While the valves could be relocated to a position above the flooded level, we have conceptually estimated the cost of such a modification to be well in excess of \$1,000,000. Because of the implementation of the check valve testing program, to ensure closure, we do not feel that the MOVs need to be relocated, or that pressure interlocks need to be installed.

- a.2) As noted in comment 3, it would appear that Regulatory Guide 1.139 should supersede the guidance provided in BTP RSB 5-1. Draft 2 of proposed Revision 1, dated February 25, 1980, has specifically deleted the requirement for diverse interlocks for the RHR isolation valves.

Although the outboard isolation valves (701, 720) do not have interlocks, the valves are keylocked closed with power removed. The key is under the administrative control of the shift supervisor. It would not be possible to inadvertently open these valves; a series of deliberate actions would be required. When taken together with the pressure interlocks provided for the inboard valves (700, 721), it is considered that sufficient protection is provided in the Ginna arrangement to prevent overpressurization of the RHR system.



b) It appears that the proposed change is reasonable in terms of providing additional protection for the RHR system. Appropriate modification to Section 3.15 of the Ginna Plant Technical Specifications will be initiated following the completed Safe Shutdown assessment.

10. The isolation of low pressure systems from the reactor coolant system is discussed on page 61 and 61a. As noted in comment 9 above, RG&E has responded to the generic letter of February 23, 1980 referenced in Section 5.3, by letter dated March 14, 1980.
11. In paragraph g on page 66, it is noted that, when applying the power diversity requirements of BTP ASB 10-1 in event of an SSE, no means to supply feed to the steam generators exists. It was determined that this was acceptable, based on low likelihood of occurrence.

This conclusion is correct; however, since BTP ASB 10-1 does not consider an SSE in conjunction with the loss of all A.C. power, there is no need to even make the evaluation. The comparisons in the SEP program should be to current criteria, rather than to arguable extrapolations. Reference to loss of all A.C. power in conjunction with an SSE should thus be deleted from this paragraph.

12. On page A-4, it is noted that additional systems are required to achieve cold shutdown for a PWR than for a BWR because of a difference in the definition of cold shutdown. This does not appear to be a reasonable basis. System requirements should be based on specific safety reasons. The NRC should be consistent in its requirements for cold shutdown, or provide a technical basis for any differences.
13. On page A-7, it is stated that the PORV's at Ginna are dependent on the plant air system. This is normally true. However, the nitrogen accumulations used for the Overpressure Protection System functions of the PORV's can be connected at any time, enabling the system. Therefore, the PORV's would be available to depressurize the RCS to RHR initiation pressure within 36 hours, as recommended in position 2 on page A-7.
14. Recommendation 1 on page A-7 states that the operating procedures should be modified to direct the operator to cool down and depressurize the RCS to RHR initiation conditions within 36 hours whenever the service water system is used for steam generator feedwater. However, the reference used as the basis for this recommendation, BNL-NUREG-28147, "Impure Water in Steam Generators and Isolation Generators" notes that..."contact at operating temperatures with NaOH - forming impure water should be avoided..." The lowering of secondary conditions during cooldown, but not necessarily all the way to RHR initiation conditions, would apparently significantly retard the potential for SG tube cracking.



Although the capability to depressurize to RHR initiation conditions is available, as noted in comment 13 above, we believe it is premature to require by procedure that this must be accomplished. Many hours would be available at the time to make the decision to proceed to cold shutdown conditions. This option should be left available to the operators, based on specific knowledge of plant conditions at the time.

