UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SUPPLEMENTAL SAFETY EVALUATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

STATION BLACKOUT RULE (10 CFR 50.63)

ROCHESTER GAS AND ELECTRIC COMPANY

R. E. GINNA NUCLEAR POWER PLANT

DOCKET NO. 50-244

1.0 INTRODUCTION

The NRC staff's Safety Evaluation (SE) pertaining to the Rochester Gas and Electric Company's (the licensee's) response to the Station Blackout (SBO) Rule, 10 CFR 50.63, was transmitted to the licensee by letter dated January 30, 1992. The staff's SE found that the licensee's proposed method of coping with an SBO event did not conform with the SBO Rule and requested the licensee to submit a revised response addressing the areas of non-conformance.

The SE contained 14 recommendations to bring the plant into conformance with the SBO Rule. These recommendations contained five requests for additional information. The licensee provided responses to the requests for additional information by letter dated April 6, 1992. However, the licensee did not respond to the remainder of the recommendations.

The licensee's responses were reviewed by the NRC staff and an NRC contractor, Science Application International Corporation (SAIC). The results of the contractor's review are documented in the attached SAIC Technical Evaluation Report (TER) SAIC-92/6694, "Supplemental Technical Evaluation Report, R. E. Ginna Nuclear Power Plant, Station Blackout Evaluation," dated August 20, 1992, (Enclosure 2). The NRC staff's evaluation follows.

2.0 EVALUATION

The licensee's responses to the staff's January 30, 1992, SE recommendations are evaluated below.

2.1 Station Blackout Duration (SE Section 2.1)

SE Recommendation

The target EDG reliability of 0.975 has been selected based on the demonstrated unit average EDG reliability for the last 100 demands. The licensee should also evaluate, and include in the documentation to be retained by the licensee in support of the SBO submittal, the EDG reliability for the last 20 and 50 demands consistent with the criteria given in RG 1.155 and NUMARC 87-00.

Licensee Response

The licensee did not respond to the recommendation.

Staff Evaluation

The licensee should commit to the recommendation and provide a schedule for its implementation.

2.2 Compressed Air (SE Section 2.2.3)

SE Recommendation

The licensee should verify/ensure that the areas which house the above cited valves are habitable during an SBO event.

Licensee Response

The licensee did not respond to the recommendation.

Staff Evaluation

The licensee should commit to the recommendation and provide a schedule for its implementation.

2.3 Effects of Loss of Ventilation (SE Section 2.2.4)

2.3.1 Control Room (SE Section 2.2.4.1)

SE Recommendation (Part 1)

The licensee should reevaluate and provide the results for staff review of the temperature rise in the control room using a conservative initial temperature corresponding to the TS temperature limits or the maximum value allowed under administrative procedures, and using conservative parameters as described in the SAIC TER for the heat-up calculations. If the licensee's administrative procedures do not specify an operating temperature limit, the licensee should establish administrative procedures or revise existing procedures to maintain the control room temperature at or below the initial temperature used in the heat-up analysis.

Licensee Response

The licensee stated that the calculations used for the control room heat-up was based on an initial temperature of 77°F. The licensee justified the use of this initial temperature based on the NUMARC 87-00 baseline assumption which states that before station blackout, it is assumed that the control room is at 78°F. The licensee stated further that RG&E utilizes Administrative Procedure A-52.12 which calls for repairing and restoring equipment that is

important to safety in an expeditious (emphasis added) manner. The licensee stated that Administrative Procedure A-52.12 will be modified to include the system that provides HVAC to the control room.

Staff Evaluation

The staff accepts the licensee's commitment to revise Administrative Procedure A-52.12 to include the control room HVAC. However, the staff cautions the licensee that NUMARC 87-00 requires that the validity of the baseline assumptions for each plant should be established and documented. Thus, the revised procedure must be structured (particularly as to the meaning of the word expeditious) to provide the necessary validity.

2.3.2 Control Room (SE Section 2.2.4.1)

The SAIC TER attached to the staff's SE questioned the validity of the control room heat-up calculation based on three factors: (1) The licensee did not state when the (heat-load) test was performed nor what the atmospheric conditions were at the time, (2) the calculated load in the control room was 14.25 kW, whereas the licensee had stated that the two inverters of 7.5 kW each are fully loaded during normal plant operation, and (3) the licensee had not indicated which ceiling tiles would be removed or that they would be removed within 30 minutes. The SE recommendation was as follows:

SE Recommendation (Part 2)

The licensee should provide for staff review, detailed information about the test performed to measure the heat loads in the control room and verify that these heat loads were correctly or conservatively measured.

Licensee Response

With respect to the heat-load test, the licensee provided data as to the time of the heat-load tests, the location and number of the thermocouples used, and the procedures used for performing the tests. The tests were conducted in February 1990. The outside air temperature did not exceed 51°F. The atmospheric conditions were documented only on a limited basis because the tests were to determine the internal heat loads. Since it was February, the sun did not significantly contribute to the solar effects, and the computation assumed (conservatively) no heat input from the sun.

With respect to the actual control room heat load, the licensee stated that the inverters were not located in the control room and that the 14.25 kW appears reasonable and conservative.

Staff Evaluation

The actual calculations used for determining the heat generation rates in the various areas from the thermocouple readings were not submitted, presumably since the calculations were performed by a computer analysis. The licensee

had described the formula used in its April 22, 1991 submittal. The staff's consultant, SAIC, questioned that analysis primarily because the test used a much lower HVAC air flow exchange rate than cited in the UFSAR, and because the computed heat load in the control room seemed unusually low as compared to the size of the inverters which supply loads in the control room. The licensee's April 6, 1992, submittal has not eliminated the staff's previous concerns and the staff cannot conclude that the heat-up in the control building areas during an SBO event is within acceptable limits. Therefore, the licensee needs to verify and provide in its documentation additional assurance that the heat loads determined by the test data and subsequent computation are realistic and conservative.

2.3.3 Control Room (SE Section 2.2.4.1)

SE Recommendation (Part 3)

The licensee should have a procedure which will require the operators to take action within 30 minutes during an SBO event to open the instrument cabinet doors per the guidance described in NUMARC 87-00.

Licensee Response

The licensee did not respond to the recommendation.

Staff Evaluation

The licensee should commit to the recommendation and provide a schedule for its implementation.

2.3.4 Control Room (SE Section 2.2.4.1)

SE Recommendation (Part 4)

The licensee should have a procedure to require operators to remove ceiling tiles and open the control room door to the turbine deck within 30 minutes during an SBO event.

Licensee Response

With respect to the ceiling tiles, the licensee stated that two alternatives are being considered: Modifying the station blackout procedure to instruct the operators to remove as many tiles as possible (at least 10% of all tiles) within 30 minutes; or, replacing at least 10% of the existing ceiling tiles with open grids. The procedure change or modification will be completed within 2 years following notification of NRC approval. With respect to opening the control room door, the licensee did not respond.

Staff Evaluation

The staff finds the commitment to remove or modify the ceiling tiles acceptable. With respect to opening the control room door, the licensee should commit to this recommendation and provide a schedule for its implementation.

2.3.5 Relay and Battery Rooms A and B (SE Section 2.2.4.2)

SE Recommendation (Part 1)

The licensee should reevaluate and provide the results for staff review of the temperature rise in the relay room and battery rooms A and B using conservative initial temperatures, corresponding to the TS temperature limits or the maximum values allowed under administrative procedures, and using conservative parameters as described in the SAIC TER for the heat-up calculations. If the licensee's administrative procedures do not specify an operating temperature limit, the licensee should establish administrative procedures or revise existing procedures to maintain the room temperatures at or below the initial room temperatures used in the heat-up analyses.

Licensee Response

Although the licensee addressed the initial temperature issue for the control room (see Section 2.3.1 above), it did not state that the administrative procedure A-52.12 would be applicable to the battery and relay rooms.

Staff Evaluation

The licensee should confirm that the administrative procedures include control of the temperatures in the battery and relay rooms, or commit to inclusion of administrative control of these temperatures.

2.3.6 Relay and Battery Rooms A and B (SE Section 2.2.4.2)

SE Recommendation (Part 2)

The licensee should provide the detailed information about the tests performed to measure the heat loads in these rooms and verify that these heat loads were correctly/conservatively measured.

Licensee Response

The licensee provided data as to the time of heat-load tests, the location and number of the thermocouples used, and the procedures used for performing the tests (see Section 2.3.2 above). The actual calculations used for determining the heat generation rates from the thermocouple readings in the various areas were not submitted, presumably since the calculations were performed by a computer analysis.

Staff Evaluation

For the reasons described in Section 2.3.2 above, the staff cannot conclude, based on the information received, that the heat loads used in the heat-up calculations were realistic or conservative. The licensee should verify and provide in its documentation additional assurance that the heat loads determined by the test data and subsequent computation are realistic or conservative.

2.3.7 Turbine Driven Auxiliary Feedwater (AFW) Pump Room (SE Section 2.2.4.3)

SE Recommendation (Part 1)

The licensee should evaluate and provide results for staff review of the temperature rise in the AFW pump room using conservative assumptions (see Enclosure 2) and assess the effect of the higher temperature on the equipment required to respond to an SBO event in the AFW pump room.

Licensee Response

The licensee provided the parameters used, the assumptions made, and the preliminary results of the calculations of the heat-up in the AFW room. The preliminary results indicate a final temperature of 151.8°F with the doors closed and 144.9°F with the doors open. The licensee stated that the results are expected to be formalized approximately 1 month before the 1992 refueling outage.

Staff Evaluation

The staff's review of the preliminary calculations finds them to be acceptable. The licensee should formalize the calculations as committed and include the documentation with the other documentation that is to be retained by the licensee in support of its response to the SBO Rule.

2.3.8 Turbine-Driven Auxiliary feedwater (AFW) Pump Room (SE Section 2.2.4.3)

SE Recommendation (Part 2)

The licensee should establish/provide a procedure to open the AFW pump room door within 30 minutes from the onset of an SBO event.

Licensee Response

The licensee did not respond to the recommendation.

Staff Evaluation

Based on the licensee's preliminary heat-up of calculations for the AFW pump room (see 2.3.7 above), which are to be formalized before the 1992 refueling outage, the SE recommendation for opening the AFW pump room door is no longer applicable. Therefore, the issue is considered resolved.

2.3.9 Turbine Driven Auxiliary feedwater (AFW) Pump Room (SE Section 2.2.4.3)

SE Recommendation (Part 3)

The licensee should assess and confirm the habitability in the AFW pump room (see SE Section 2.2.3)

Licensee Response

The licensee did not respond to the recommendation.

Staff Evaluation

The licensee should provide the requested confirmation.

2.3.10 Atmospheric Steam Dump Valve (ADV) Area (SE Section 2.2.4.4)

SE Recommendation

The licensee should evaluate the operability of equipment and the habitability (see SE Section 2.2.3) at the above cited temperature in the ADV area during an SBO event.

Licensee Response

The licensee did not respond to the recommendation.

Staff Evaluation

The licensee should commit to the recommendation and provide a scheduled date for its implementation.

2.4 Quality Assurance and Technical Specifications (SE Section 2.5)

SE Recommendation

The licensee should verify that the SBO equipment is covered by an appropriate QA program consistent with the guidance of RG 1.155. This evaluation should be documented as part of the documentation supporting the SBO Rule response.

Licensee Response

The licensee did not respond to the recommendation.

Staff Evaluation

The licensee should commit to the recommendation and provide a scheduled date for its implementation.

2.5 EDG Reliability Program (SE Section 2.6)

SE Recommendation

It is the staff position that a reliability program should be developed in accordance with the guidance of RG 1.155, Section 1.2. If an EDG reliability program currently exists, the program should be evaluated and adjusted in accordance with RG 1.155. Confirmation that such a program is in place or will be implemented should be included in the documentation that is to be maintained by the licensee in support of the SBO submittals.

Licensee Response

The licensee did not respond to the recommendation.

Staff Evaluation

The licensee should commit to the recommendation and provide a scheduled date for its implementation.

3.0 SUMMARY AND CONCLUSION

The licensee responded to the staff's January 30, 1992 SE pertaining to the SBO Rule (10 CFR 50.63) by letter dated April 6, 1992. The staff has reviewed the licensee's response and finds several commitments that need to be made and items that need to be verified as noted in this SSE to bring the licensee into compliance with the SBO Rule.

This SSE documents the NRC's final regulatory assessment of the licensee's proposed conformance to the SBO Rule. Therefore, no further submittals are required. The staff considers the 2-year clock for implementation of the SBO Rule in accordance with 10 CFR 50.63(c)(4) to begin upon receipt by the licensee of this SSE. Therefore, the licensee should take the necessary actions to complete compliance with the SBO Rule as indicated in the staff's SE and SSE. The documentation of the analyses and actions required to resolve the itemized concerns should be included with the other documentation to be maintained by the licensee in support of the SBO Rule implementation for possible future NRC audit.

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