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TECHNICAL EVALUATION REPORT
REACTOR TRIP SYSTEM RELIABILITY
CONFORMANCE TO
ITEM 4.5.2 OF GENERIC LETTER 83-28
JOSEPH M. FARLEY NUCLEAR PLANT UNITS 1 AND 2
R. E. GINNA NUCLEAR POWER PLANT
HADDAM NECK PLANT
INDIAN POINT UNIT NO. 2
INDIAN POINT 3 NUCLEAR POWER PLANT
KEWAUNEE NUCLEAR POWER PLANT
NORTH ANNA UNITS 1 AND 2
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2
PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNITS 1 AND 2

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ABSTRACT

This EG&G Idaho, Inc. report provides a review of the submittals for some of the Westinghouse (W) nuclear plants for conformance to Generic Letter 83-28, Item 4.5.2. The report includes the following plants, all Westinghouse, and is in partial fulfillment of the following TAC Nos.:

Plant	Docket Number	TAC Number
Joseph M. Farley Unit 1	50-348	53980
Joseph M. Farley Unit 2	50-364	53981
R. E. Ginna Nuclear Power Plant	50-244	53985
Haddam Neck Plant	50-213	53987
Indian Point Unit 2	50-247	53990
Indian Point 3 Nuclear Power Plant	50-286	53991
Kewaunee Nuclear Power Plant	50-305	53992
North Anna Unit 1	50-338	54003
North Anna Unit 2	50-339	54004
Point Beach Nuclear Plant Unit 1	50-266	54013
Point Beach Nuclear Plant Unit 2	50-301	54014
Prairie Island Nuclear Generating Plant Unit 1	50-282	54015
Prairie Island Nuclear Generating Plant Unit 2	50-306	54016

FOREWORD

This report is provided as part of the program for evaluating licensee/applicant conformance to Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events." This work is conducted for the U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Division of PWR Licensing-A by EG&G Idaho, Inc.

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1. INTRODUCTION

On July 8, 1983, Generic Letter 83-28[1] was issued by D. G. Eisenhut, Director of the Division of Licensing, Office of Nuclear Reactor Regulation, to all licensees of operating reactors, applicants for operating licenses, and holders of construction permits. This letter included required actions based on generic implications of the Salem ATWS events. These requirements have been published in Volume 2 of NUREG-1000, "Generic Implications of ATWS Events at the Salem Nuclear Power Plant."[2]

This report documents the EG&G Idaho, Inc. review of the submittals of some of the Westinghouse plants including Farley Units 1 and 2, Ginna, Haddam Neck, Indian Point Units 2 and 3, Kewaunee, North Anna Units 1 and 2, Point Beach Units 1 and 2 and Prairie Island Units 1 and 2 for conformance to Item 4.5.2 of Generic Letter 83-28. The submittals from the licensees utilized in these evaluations are referenced in Section 14 of this report.

2. REVIEW REQUIREMENTS

Item 4.5.2 (Reactor Trip System Reliability - System Functional Testing - On-Line Testing) requires licensees and applicants with plants not currently designed to permit on-line testing to justify not making modifications to permit such testing. Alternatives to on-line testing will be considered where special circumstances exist and where the objective of high reliability can be met in another way. Item 4.5.2 may be interdependent with Item 4.5.3 when there is a need to justify not performing on-line testing because of the peculiarities of a particular design.

All portions of the Reactor Trip System that do not have on-line testing capability will be reviewed under the guidelines for this item. Maintenance and testing of the Reactor Trip Breakers are also excluded from this review, as they are evaluated under Item 4.2. This review of the licensee/applicant submittals will:

1. Confirm that the licensee/applicant has identified those portions of the Reactor Trip System that are not on-line testable. If the entire Reactor Trip System is verified to be on-line testable, no further review is required.

2. Evaluate modifications proposed by licensees/applicants to permit on-line testing against the existing criteria for the design of the protection systems for the plant being modified.

3. Evaluate proposed alternatives to on-line testing of the Reactor Trip System for acceptability based on the following:

a. The licensee/applicant submittal substantiates the impracticality of the modifications necessary to permit on-line testing, and

b. High Reactor Trip System availability (comparable to that which would be possible with on-line testing) is achieved in another way. Any such proposed alternative must be described in detail sufficient to permit an independent evaluation of the basis and analysis provided in lieu of performing on-line testing. Methods that may be used to demonstrate that the objective of high reliability has been met may include the following:

   i. Demonstration by systematic analysis that testing at shutdown intervals provides essentially equivalent reliability to that obtained by on-line testing at shorter intervals.

   ii. Demonstration that reliability equivalent to that obtained by on-line testing is accomplished by additional redundant and diverse components or by other features.

   iii. Development of a maintenance program based on early replacement of critical components that compensates for the lack of on-line testing. Such a program would require analytical justification supported by test data.

   iv. Development of a test program that compensates for the lack of on-line testing, e. g., one which uses trend analysis and identification of safety margins for critical parameters of safety-related components. Such a program would require analytical justification supported by test data.

4. Verify the capability to perform independent on-line testing of the reactor trip system breaker undervoltage and shunt trip attachments on CE plants. Information from licensees and applicants with CE plants will be reviewed to verify that they require independent on-line testing of the reactor trip breaker undervoltage and shunt trip attachments.

3. GROUP REVIEW RESULTS

The relevant submittals from each of the Westinghouse reactor plants were reviewed to determine compliance with Item 4.5.2. First, the submittals from each plant were reviewed to establish that Item 4.5.2 was specifically addressed. Second, the submittals were evaluated to determine the extent to which each of the Westinghouse plants complies with the staff guidelines for Item 4.5.2.

4. REVIEW RESULTS FOR JOSEPH M. FARLEY NUCLEAR PLANT UNITS 1 AND 2

4.1 Evaluation

Alabama Power Company, the license for Farley 1 and 2, provided their response to Item 4.5.2 of the Generic Letter on November 4, 1983. In that response, the licensee states that Farley performs on-line testing of the undervoltage and shunt trip attachments to the reactor trip breakers.

It is not clear from the licensee response that Farley performs on-line testing of the reactor trip system; however, the licensee's Technical Specifications require monthly operability testing of all portions of the RTS, which implies this testing is performed on-line.

In a Safety Evaluation Report issued on September 20, 1983, the NRC confirmed that the shunt and undervoltage trips are independently tested on-line.

4.2 Conclusion

We find that the licensee is required to periodically test all portions of the RTS on-line, and that the shunt and undervoltage trips are independently tested on-line, which meets the staff's position and is, we believe, acceptable.

5. REVIEW RESULTS FOR R. E. GINNA NUCLEAR POWER PLANT

5.1 Evaluation

Rochester Gas and Electric, the licensee for Ginna, provided their response to Item 4.5.2 of the Generic Letter on November 4, 1983. In that response, the licensee states that Ginna will perform on-line testing of the Reactor Trip System, including independent testing of the undervoltage and shunt trip attachments to the reactor trip breakers. The licensee further states that the on-line testing will be conducted on an annual or refueling basis.

5.2 Conclusion

We find the applicant's statement of the extent to which they will perform on-line testing of the RTS meets the staff position on Item 4.5.2 of the Generic Letter and is, we believe, acceptable. The licensee's proposal to conduct such testing at annual or refueling intervals will be evaluated as part of the resolution of Generic Letter 83-28, Item 4.5.3, and Generic Letter 85-09.

6. REVIEW RESULTS FOR HADDAM NECK PLANT

6.1 Evaluation

Northeast Utilities, the licensee for Haddam Neck, responded to Item 4.5.2 of the Generic Letter on November 5, 1983 and October 18, 1985. In those responses, the licensee states that Haddam Neck was not designed to permit performance of on-line testing of the Reactor Trip System. The Haddam Neck design does not include bypass breakers, which are necessary to permit on-line tripping of the reactor trip breakers without tripping the reactor. The licensee states that installation of the equipment required to modify the plant would be very difficult to accomplish because of the lack of space in the switchgear room, and that the Haddam Neck design provides simultaneous operation of both shunt and undervoltage trip attachments. The licensee also states that maintenance and inspection of the RTBs revealed no indications of failure to trip during the past 19 years of operation.

6.2 Conclusion

We find that the licensee's justification for not installing the modifications necessary to permit on-line testing of the Reactor Trip System at Haddam Neck is acceptable, in view of the cost and difficulty of installing the necessary equipment and of the satisfactory history of reactor trip reliability at the plant.

7. REVIEW RESULTS FOR INDIAN POINT UNIT NO. 2

7.1 Evaluation

Consolidated Edison, the licensee for Indian Point 2, responded to Item 4.5.2 of the Generic Letter on November 4, 1983. In that response, the licensee states that Indian Point 2 is designed to permit performance of on-line testing of the Reactor Trip System, including independent on-line testing of the shunt and undervoltage attachments.

7.2 Conclusion

We find that the licensee's statement that they perform on-line testing of the RTS, including independent on-line testing of the shunt and undervoltage attachments, meets the staff position on Item 4.5.2 of the Generic Letter and is, we believe, acceptable.

8. REVIEW RESULTS FOR INDIAN POINT 3 NUCLEAR POWER PLANT

8.1 Evaluation

The New York Power Authority, the licensee for Indian Point 3, responded to Item 4.5.2 of the Generic Letter on November 7, 1983. In that response the licensee states that Indian Point 3 is designed to permit performance of on-line testing of the Reactor Trip System and commits to on-line testing of the reactor protection system, including testing of the undervoltage and shunt trip attachments. However, it is not clear from the response that the licensee can perform independent verification of the operability of the diverse trip features.

8.2 Conclusion

We find that the licensee's statement that they will perform on-line testing of the RTS meets the staff position on Item 4.5.2 of the Generic Letter and is, we believe, acceptable. However, the licensee should confirm that the Indian Point 3 on-line testing includes the capability to perform independent verification of the operability of the diverse trip features.

9. REVIEW RESULTS FOR KEWAUNEE NUCLEAR POWER PLANT

9.1 Evaluation

Wisconsin Public Service Corporation, the licensee for Kewaunee, responded to Item 4.5.2 of the Generic Letter on December 7, 1983, and April 13, 1984. In those responses, the licensee states that the Kewaunee plant performs on-line testing of the reactor trip breakers, specifically including testing of the breaker undervoltage trip attachment, and that Kewaunee plans to implement a design change which will allow independent verification of the operation of the shunt trip attachment. The licensee's Technical Specifications require that on-line testing of all portions the Reactor Trip System be performed on a periodic basis.

9.2 Conclusion

We find that the licensee's responses did not clearly state that the entire Reactor Trip System could be functionally tested. However, since the Technical Specifications do require that all portions the RTS be periodically tested, which implies that they are tested on-line, we believe these requirements and the licensee's commitment to perform independent on-line testing of the undervoltage and shunt trip attachments meet the staff's position on Generic Letter 83-28, Item 4.5.2, and are, we believe, acceptable.

10. REVIEW RESULTS FOR NORTH ANNA UNITS 1 AND 2

10.1 Evaluation

Virginia Electric and Power Company, the licensee for North Anna, responded to Item 4.5.2 of the Generic Letter on November 4, 1983. In that response, the licensee states that at North Anna, procedures are being revised to include independent testing of the diverse trip features, and that Item 4.5.2 of the Generic Letter is not applicable.

10.2 Conclusion

We find the licensee's statement that Item 4.5.2 is not applicable to be confirmation that North Anna performs on-line testing of the RTS, that this confirmation meets the staff position on Item 4.5.2 of the Generic Letter and is, we believe, acceptable.

11. REVIEW RESULTS FOR POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

11.1 Evaluation

Wisconsin Electric Power Company, licensee for Point Beach Units 1 and 2, responded to the Generic Letter on November 7, 1983. The licensee's response states that Point Beach will make modifications to permit them to perform on-line testing of the Reactor Trip System, including independent on-line testing of the shunt and undervoltage trip attachments.

11.2 Conclusion

We find that the licensee's statement that they will make modifications to permit them to perform on-line testing of the RTS meets the staff position on Item 4.5.2 of the Generic Letter and is, we believe, acceptable.

12. REVIEW RESULTS FOR PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNITS 1 AND 2

12.1 Evaluation

Northern States Power Company, the licensee for Prairie Island Units 1 and 2 submitted a response to Item 4.5.2 of the Generic Letter on November 4, 1983. In that response, the licensee states that Point Beach is designed to permit on-line testing of the Reactor Trip System, that on-line testing is performed monthly, and that the ability to functionally test the diverse trip features will be in place upon completion of the automatic shunt trip actuation modification. The licensee's July 6, 1984, letter describing the Prairie Island shunt trip attachment actuation modification confirms that shunt and undervoltage trip attachment testing is both on-line and independent.

12.2 Conclusion

We find that the licensee's statement that Point Beach Units 1 and 2 are designed to permit on-line testing of the RTS meets the staff position on Item 4.5.2 of the Generic Letter and is, we believe, acceptable.

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em 4.5.2 of Generi
at Indian Point 3 must pr
plant specific review.

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