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INFORMAL REPORT

CONFORMANCE TO ITEM 4.5.2 OF GENERIC LETTER 83-28, ARKANSAS NUCLEAR ONE-2, CALVERT CLIFFS-1 AND -2, FT. CALHOUN, MAINE YANKEE, MILLSTONE-2, PALISADES, PALO VERDE-1, -2, AND -3, SAN ONOFRE-2 AND -3, ST. LUCIE-1 AND -2, WATERFORD-3, WNP-3

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EG&G Idaho

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CONFORMANCE TO ITEM 4.5.2 OF GENERIC LETTER 83-28 ARKANSAS NUCLEAR ONE-2 CALVERT CLIFFS-1 AND -2 FT. CALHOUN MAINE YANKEE MILLSTONE UNIT 2 PALISADES PALO VERDE-1, -2 AND -3 SAN ONOFRE-2 AND -3 ST. LUCIE-1 AND -2 WATERFORD-3 WNP-3

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ABSTRACT

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

Plant	Docket Number	TAC Number
Arkansas Nuclear One, Unit 2	50-368	53961
Calvert Cliffs Unit 1	50-317	53969
Calvert Cliffs Unit 2	50-318	53970
Ft. Calhoun	50-285	53983
Maine Yankee	50-309	53996
Millstone Unit 2	50-336	54000
Palisades	50-255	54009
Palo Verde Unit 1	50-528	59173
Palo Verde Unit 2 (OL)	50-529	N/A
Palo Verde Unit 3 (OL)	50-530	N/A
San Onofre Unit 2	50-361	54024
San Onofre Unit 3	50-362	54025
St. Lucie Unit 1	50-335	54028
St. Lucie Unit 2	50-389	54029
Waterford SES Unit 3 (OL)	50-382	57710
WNP 3 (OL)	50-508	N/A

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 all the CE plants including Arkansas Nuclear One, Unit 2, Calvert Cliffs Units 1 and 2, Ft. Calhoun, Maine Yankee, Millstone Unit 2, Palisades, Palo Verde Units 1, 2 and 3, San Onofre Units 2 and 3, St. Lucie Units 1 and 2, Waterford SES Unit 3 and WNP 3 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 16 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 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 CE 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 CE plants complies with the staff guidelines for Item 4.5.2.

4. REVIEW RESULTS FOR ARKANSAS NUCLEAR ONE, UNIT 2

4.1 Evaluation

Arkansas Power and Light Company (AP&L), the license for Arkansas Nuclear One, provided their response to Item 4.5.2 of the Generic Letter on November 5, 1983. In that response, the licensee states that AP&L performs on-line testing of the Reactor Trip System, including independent verification of the shunt and undervoltage trip attachments to the RTBs.

4.2 Conclusion

We find that the licensee's statement that they currently 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.

5. REVIEW RESULTS FOR CALVERT CLIFFS UNITS 1 AND 2

5.1 Evaluation

Baltimore Gas and Electric, licensee for Calvert Cliffs 1 and 2, responded to the Generic Letter on November 5, 1983, and February 29, 1984. The licensee's responses confirm that Calvert Cliffs is designed to permit on-line testing of the Reactor Trip System and that the shunt and undervoltage trip attachments are independently tested on-line.

5.2 Conclusion

We find that the licensee's statement that they currently 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.

6. REVIEW RESULTS FOR FT. CALHOUN

6.1 Evaluation

The Omaha Public Power District, the licensee for Ft. Calhoun, responded to Item 4.5.2 of the Generic Letter on November 4, 1983. In that response, the licensee states that Ft. Calhoun performs on-line testing of the Reactor Trip System, and that Ft. Calhoun has an older C-E design reactor trip system which does not use breakers. Instead it uses four independent contactors, each of which can be independently tested at power, which meets the requirements of Item 4.5.2 of the Generic Letter for C-E plants.

6.2 Conclusion

We find that the licensee's statement that they currently 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.

7. REVIEW RESULTS FOR MAINE YANKEE

7.1 Evaluation

Maine Yankee Atomic Power Company, the licensee for Maine Yankee, responded to Item 4.5.2 of the Generic Letter on November 10, 1983. In that response the licensee states that Maine Yankee performs on-line testing of the Reactor Trip System, and is pursuing modifications that will permit on-line independent 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 meets the staff position on Item 4.5.2 of the Generic Letter and is, we believe, acceptable.

8. REVIEW RESULTS FOR MILLSTONE UNIT 2

8.1 Evaluation

Northeast Utilities, the licensee for Millstone 2, responded to Item 4.5.2 of the Generic Letter on November 8, 1983. In that response the licensee states that Millstone 2 performs on-line testing of the Reactor Trip System. However, the response also states that independent testing of the shunt and undervoltage attachments is performed at eighteen month intervals; it is not clear from the response that the plant is designed to permit independent on-line verification of operability of the shunt and undervoltage attachments.

8.2 Conclusion

We find that the licensee's position on Item 4.5.2 of the Generic Letter is unacceptable. The licensee must confirm that the plant has the capability to perform independent on-line testing of the shunt and undervoltage attachments.

9. REVIEW RESULTS FOR PALISADES

9.1 Evaluation

Consumers Power Company, the licensee for Palisades, responded to Item 4.5.2 of the Generic Letter on February 19, 1985, and July 1, 1985. In the latter response the licensee states that Palisades currently performs on-line testing of the Reactor Trip System, and that Palisades has an older C-E design reactor trip system which does not use breakers. Instead it uses four independent contactors, each of which can be independently tested at power, which meets the requirements of Item 4.5.2 of the Generic Letter for C-E plants.

9.2 Conclusion

We find that the licensee's statement that they 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.

10. REVIEW RESULTS FOR PALO VERDE UNITS 1, 2 AND 3

10.1 Evaluation

Arizona Public Service Company, the licensee for Palo Verde Unit 1 and applicant for Palo Verde Units 2 and 3, responded to Item 4.5.2 of the Generic Letter on November 3, 1983. In that response, the licensee states that the Palo Verde design allows performance of on-line testing of the Reactor Trip System, and that the applicable procedures for the on-line testing includes independent testing of the reactor trip breaker shunt and undervoltage trip attachments.

10.2 Conclusion

We find that the licensee's statement that they currently perform on-line testing of the RTS at Palo Verde 1 and will perform on-line testing of the RTS at Palo Verde 2 and 3 meets the staff position on Item 4.5.2 of the Generic Letter and is, we believe, acceptable.

11. REVIEW RESULTS FOR SAN ONOFRE UNITS 2 AND 3

11.1 Evaluation

Southern California Edison Company, the licensee for San Onofre Units 2 and 3, responded to Item 4.5.2 of the Generic Letter on November 29, 1983, and October 2, 1985. In the latter response, the licensee states that the San Onofre Unit 2 and 3 design allows performance of on-line testing of the Reactor Trip System. However, it is not clear from the responses that the plant is designed to permit independent on-line verification of operability of the reactor trip breaker shunt and undervoltage trip attachments.

11.2 Conclusion

We find that the licensee's responses are inadequate to evaluate the extent of compliance with the staff position on Item 4.5.2 of the Generic Letter and are, therefore, unacceptable. The licensee is required to confirm that the plants have the capability to perform on-line independent verification of reactor trip breaker shunt and undervoltage trip attachment operability.

12. REVIEW RESULTS FOR ST. LUCIE UNITS 1 AND 2

12.1 Evaluation

Florida Power and Light Company, licensee for St. Lucie Units 1 and 2, responded to the Generic Letter on November 8, 1983. The licensee's response confirms that St. Lucie is designed to permit on-line testing of the Reactor Trip System and that monthly on-line testing of the RTS, including independent testing of the shunt and undervoltage trip attachments, is performed.

12.2 Conclusion

We find that the licensee's statement that they currently 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.

13. REVIEW RESULTS FOR WATERFORD SES UNIT 3

13.1 Evaluation

Louisiana Power and Light, the licensee for Waterford 3, provided a response to Item 4.5.2 of the Generic Letter on November 4, 1983. In that response, the licensee states that Waterford is designed to permit on-line testing of the Reactor Trip System, and that the applicable procedure is being revised to include the required functional testing of the diverse trip features. It is not clear from the response that the on-line testing of the diverse trip features includes independent verification of the shunt and undervoltage trip attachment operability.

13.2 Conclusion

We find that the licensee's statement that Waterford 3 is 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, provided the licensee confirms that Waterford 3 has the capability to perform independent on-line verification of the shunt and undervoltage trip attachment operability.

14. REVIEW RESULTS FOR WNP 3

14.1 Evaluation

Washington Public Power Supply System, the applicant for WNP 3, responded to Item 4.5.2 of the Generic Letter on August 23, 1983. In that response, the applicant states that construction of WNP 3 is currently delayed and that it is not possible to commit to a schedule for compliance with the requirements of Generic Letter 83-28.

14.2 Conclusion

Item 4.5.2 of the Generic Letter will be resolved for WNP 3 during the review and approval process subsequent to resumption of construction and licensing activities for WNP 3. Therefore, we consider this Item to be closed for this evaluation.

15. GROUP CONCLUSION

We conclude that the licensee/applicant responses for the listed CE plants for Item 4.5.2 of Generic Letter 83-28 are acceptable, with the exception of those for Millstone Unit 2, San Onofre Units 2 and 3 and Waterford 3, which were found to be incomplete as indicated in the plant specific review results. WNP 3 is in a state of extended construction delay and the staff has closed this Item for this evaluation because it will be resolved during the resumption of licensing activities.

16. REFERENCES

1. NRC Letter, D. G. Eisenhut to all licensees of Operating Reactors, Applicants for Operating License, and Holders of Construction Permits, "Required Actions Based on Generic Implications of Salem ATWS Events (Generic Letter 83-28)," July 8, 1983.

2. Generic Implications of ATWS Events at the Salem Nuclear Power Plant NUREG-1000, Volume 1, April 1983; Volume 2, July 1983.

3. Arkansas Power and Light Company letter to NRC, J. R. Marshall to D. G. Eisenhut, Director, Division of Licensing, NRC, "Arkansas Nuclear One Response to Generic Letter 83-28," November 5, 1983.

4. Baltimore Gas and Electric letter to NRC, A. E. Lundvall to D. G. Eisenhut, Director, Division of Licensing, November 5, 1983.

5. Baltimore Gas and Electric letter to NRC, A. E. Lundvall to D. G. Eisenhut, Director, Division of Licensing, February 29, 1984.

6. Omaha Public Power District letter to NRC, W. C. Jones to D. G. Eisenhut, Director, Division of Licensing, NRC, "Required Actions Based on Generic Implications of Salem ATWS Events (Generic Letter 83-28)," November 4, 1983.

7. Maine Yankee Atomic Power Company letter to NRC, C. D. Frizzle to Director of Nuclear Reactor Regulation, NRC, "Required Actions Based on Generic Implications of Salem ATWS Events (Generic Letter 83-28)," November 10, 1983.

8. Northeast Utilities letter to NRC, W. G. Counsil to D. G. Eisenhut, Director, Division of Licensing, November 8, 1983.

9. Consumers Power Company letter to NRC, James L. Kuemin to Director, Nuclear Reactor Regulation, "Supplemental Response to Generic Letter 83-28," July 1, 1985.

10. Arizona Public Service Company letter to NRC, E. E. Van Brunt, Jr., to Director, Nuclear Reactor Regulation, November 3, 1983.

11. Southern California Edison Company letter to NRC, F. R. Nandy to Director, Office of Nuclear Reactor Regulation, "Response to Generic Letter 83-28," November 29, 1983.

12. Southern California Edison Company letter to NRC, M. O. Medford to Director, Office of Nuclear Reactor Regulation, October 2, 1985.

13. Florida Power and Light Company letter to NRC, J. W. Williams, Jr., to D. G. Eisenhut, Director, Division of Licensing, "Generic Letter 83-28," November 8, 1983.

14. Louisiana Power and Light letter to NRC, K. W. Cook to D. G. Eisenhut, Director, Division of Licensing, "Required Actions Based on Generic Implications of Salem ATWS Events (Generic Letter 83-28)," November 4, 1983.

15. Washington Public Power Supply System letter to NRC, G. C. Sorenson to Director, Division of Licensing, "Nuclear Project No. 3, Response to Generic Letter 83-28, Salem ATWS Event," August 23, 1983.

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This EG&G Idaho, Inc. report presents the results of our evaluation of the submittals of the Combustion Engineering nuclear plants for conformance to Generic Letter 83-28, Item 4.5.2.

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