



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 29, 2010

Mr. Robert J. Duncan II
Vice President – Robinson Nuclear Plant
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant,
Unit No. 2
3581 West Entrance Road
Hartsville, South Carolina 29550

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 – REVIEW OF ANNUAL REPORT OF CHANGES TO OR ERRORS DISCOVERED IN AN ACCEPTABLE LOSS-OF-COOLANT ACCIDENT EVALUATION MODEL OR APPLICATION OF SUCH A MODEL (TAC NO. ME2833)

Dear Mr. Duncan:

By letter dated November 24, 2009, as supplemented by a letter dated June 22, 2010, Carolina Power & Light Company (the licensee), now doing business as Progress Energy Carolinas, Inc., submitted to the U.S. Nuclear Regulatory Commission (NRC) an annual report of changes to or errors discovered in an acceptable loss-of-coolant accident evaluation model or application of such a model in accordance with Title 10 of the *Code of Federal Regulations*, Section 50.46(a)(3)(ii).

The NRC staff finds that the errors identified in the report are acceptable as discussed in the enclosure. This concludes the staff's review of this issue and the subject TAC will be closed.

If you have any questions about this matter, please contact me at (301) 415-2020.

Sincerely,

A handwritten signature in cursive script that reads "Brenda L. Mozafari".

Brenda L. Mozafari, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-261

Enclosure: Safety Evaluation

cc: Distribution via Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO ANNUAL REPORT OF CHANGES TO OR ERRORS

DISCOVERED IN AN ACCEPTABLE LOSS-OF-COOLANT ACCIDENT

EVALUATION MODEL OR APPLICATION OF SUCH A MODEL

CAROLINA POWER & LIGHT COMPANY

H.B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

DOCKET NO. 50-261

1.0 INTRODUCTION

By a letter dated November 24, 2009 (Reference 1), as clarified by a letter dated June 22, 2010 (Reference 2), Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc. (the licensee) submitted an annual report of changes to or errors discovered in an acceptable Loss-of-Coolant Accident (LOCA) evaluation model for the Emergency Core Cooling System (ECCS) at the H. B. Robinson Steam Electric Plant (HBRSEP), Unit 2.

2.0 REGULATORY EVALUATION

The purpose of the annual report of changes to or errors discovered in an acceptable LOCA evaluation model application for the ECCS is to meet the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.46(a)(3)(ii).

It is stated, in part, in 10 CFR 50.46, "Acceptable criteria for emergency core cooling systems for light-water nuclear power reactors," that: (1) ECCS cooling performance must be calculated in accordance with an acceptable evaluation model and must be calculated for a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated LOCAs are calculated; and (2) an ECCS must be designed so that its calculated cooling performance following postulated LOCAs conforms to the criteria that peak cladding temperature (PCT) not exceed 2200 degrees Fahrenheit; maximum cladding oxidation not exceed 0.17 times the total cladding thickness before oxidation; maximum hydrogen generation not exceed 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react; coolable geometry that the core remains amenable to cooling; and long-term cooling capability to maintain core temperature at an acceptably low value and to remove decay heat for the extended period of time required by the long-lived radioactivity remaining in the core.

ENCLOSURE

3.0 TECHNICAL EVALUATION

The staff reviewed the annual report of change to or errors discovered in an acceptable LOCA evaluation model application for the ECCS for HBRSEP (Reference 1) and the response to the U.S. Nuclear Regulatory Commission (NRC) request for additional information (Reference 2) and concluded that the licensee provided sufficient information to address the issues required by 10 CFR 50.46(a)(3)(ii). Therefore, the annual report is acceptable because:

1. The annual report covering the period of March 24, 2009 through November 5, 2009, provides results from large break LOCA (LBLOCA) evaluation model and small break LOCA (SBLOCA) evaluation model in a summary table with a consideration of correction of two errors (i.e., the coding of the point kinetics model - using recommended convergence criteria and the heat conduction solution - using last mesh interval heat capacity).
2. Specific errors and its impact on the results shown in the table were identified. The impact of -29 degrees F PCT change for LBLOCA evaluation and 8 degrees F PCT change for SBLOCA evaluation are small in comparison to the degree of cladding temperature rise evaluated.
3. The same specific model for the radiation heat transfer and heat conduction (which is used to support the NRC staff's review of EMF-2103(P)(A) Rev. 0) is used.
4. New database used for RODEX4 approval on pellet thermal conductivity as burnup is used for the RODEX computer code.
5. Approved methodologies are used for LBLOCA and SBLOCA evaluation.

4.0 CONCLUSION

Based on the NRC staff's review, the NRC staff concludes that the annual report of changes to or errors discovered in an acceptable LOCA evaluation model application for the ECCS for HBRSEP is acceptable.

5.0 REFERENCES

1. Letter (RNP-RA/09-0102) from Curt Castell to NRC, "Annual Report of Changes To or Errors Discovered in an Acceptable Loss-Of-Coolant Accident Evaluation Model Application for the Emergency Core Cooling System," November 24, 2009.
2. Letter (RNP-RA/10-0055) from Curtis A. Castell to NRC, "Response to NRC Request for Additional Information Regarding Annual Report of Changes To or Errors Discovered in An Acceptable Loss-Of-Coolant Accident Evaluation Model Application for the Emergency Core Cooling System (TAC No. ME2833)," June 22, 2010.

November 29, 2010

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Sincerely,

/RA/

Brenda L. Mozafari, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-261

Enclosure: Summary

cc: Distribution via Listserv

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DATE	11/04/2010	11/04/2010	10/29/10	11/29/2010	11/29/2010

*via memo

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