

November 27, 2007

Mr. James Scarola, Vice President
Brunswick Steam Electric Plant
Carolina Power & Light Company
Post Office Box 10429
Southport, North Carolina 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 - ISSUANCE OF
AMENDMENT STORAGE OF AREVA NP FUEL (TAC NOS. MD4061 AND
MD4062)

Dear Mr. Scarola:

The Commission has issued the enclosed Amendment No. 243 to Renewed Facility Operating License No. DPR-71 and Amendment No. 271 to Facility Operating License No. DPR-62 for Brunswick Steam Electric Plant, Units 1 and 2. The amendments are in response to your application dated January 22, 2007, as supplemented by letter dated September 28, 2007.

The amendments change the Technical Specifications related to the fuel design description and the fuel criticality methods to accommodate the transition to AREVA NP fuel.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* Notice.

Sincerely,

/RA/

Stewart N. Bailey, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-325
and 50-324

Enclosures:

1. Amendment No. 243 to
License No. DPR-71
2. Amendment No. 271 to
License No. DPR-62
3. Safety Evaluation

cc w/enclosures: See next page

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BRUNSWICK, UNIT 1
AMENDMENT NO. 271 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-62 -
BRUNSWICK, UNIT 2

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Brunswick Steam Electric Plant
Units 1 and 2

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CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 243
Renewed License No. DPR-71

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Carolina Power & Light Company (the licensee), dated January 22, 2007, as supplemented by letter dated September 28, 2007, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-71 is hereby amended to read as follows:

- (2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 243, are hereby incorporated in the license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA by EBrown Acting for/

Thomas H. Boyce, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Operating License
and Technical Specifications

Date of Issuance: November 27, 2007

ATTACHMENT TO LICENSE AMENDMENT NO. 243

RENEWED FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

Replace Page 4 of Renewed Operating License DPR-71 with the attached Page 4.

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

4.0-1

4.0-2

Insert Pages

4.0-1

4.0-2

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 271
Renewed License No. DPR-62

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Carolina Power & Light Company (the licensee), dated January 22, 2007, as supplemented by letter dated September 28, 2007, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-62 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 271, are hereby incorporated in the license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA by EBrown Acting for/

Thomas H. Boyce, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Operating License
and Technical Specifications

Date of Issuance: November 27, 2007

ATTACHMENT TO LICENSE AMENDMENT NO. 271

FACILITY OPERATING LICENSE NO. DPR-62

DOCKET NO. 50-324

Replace Page 3 of Renewed Operating License DPR-62 with the attached Page 3.

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

4.0-1
4.0-2

Insert Pages

4.0-1
4.0-2

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 243 AND 271

TO RENEWED FACILITY OPERATING LICENSES NOS. DPR-71 AND DPR-62

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

DOCKET NOS. 50-325 AND 50-324

1.0 INTRODUCTION

By letter January 22, 2007 (Ref. 1), the Carolina Power & Light Company (the licensee) requested amendments to Renewed Operating Licenses DPR-71 and DPR-62 for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2, respectively. The proposed changes will permit the storage of AREVA NP fuel in the BSEP spent fuel pools (SFPs) and new fuel storage racks, and are necessary to support the transition to AREVA NP fuel at BSEP. The licensee provided additional information by letter dated September 28, 2007 (Ref. 2).

The current BSEP Technical Specifications (TSs) use nomenclature that is specific to Global Nuclear Fuels, Americas (GNF-A) fuel designs and criticality analysis methods. However, AREVA NP performed the analysis to support the transition to ATRIUM™ 10 fuel at BSEP. The licensee proposed to modify TS 4.2.1, "Fuel Assemblies," and TS 4.3.1, "Criticality," to adjust the fuel description and the criticality criteria to support storage of ATRIUM™ 10 fuel assemblies in the SFPs and new fuel storage vault.

The supplement dated September 28, 2007, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on August 29, 2007 (72 FR 49742).

2.0 REGULATORY EVALUATION

The Nuclear Regulatory Commission (NRC) promulgated the basic fuel storage requirements in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix A, General Design Criterion (GDC) 61, "Fuel storage and handling and radioactivity control," GDC 62, "Prevention of criticality in fuel storage and handling," and GDC 63, "Monitoring fuel and waste storage." The reactivity control requirements for fuel storage pools are promulgated in 10 CFR 50.68, "Criticality accident requirements." The NRC has also developed several guidance documents that address regulatory application of the above requirements. These include Regulatory Guide 1.13, "Spent Fuel Storage Facility Design Basis" (Ref. 3), Sections 9.1.1 and 9.1.2, "Spent Fuel Storage," of the Standard Review Plan (NUREG-0800, Ref. 4), and a letter from L. Kopp to T. Collins, NRC, "Guidance on the Regulatory Requirements for Criticality Analysis of Fuel

Storage at Light-Water Reactor Power Plants” (Ref. 5). Finally, several American National Standards Institute (ANSI)/American Nuclear Society (ANS) standards contain related guidance, including ANSI/ANS 8.17, 1984, and ANSI/ANS 57.2, 1983.

3.0 TECHNICAL EVALUATION

Currently, TS 4.2.1 provides a general description of fuel assembly designs in use at BSEP. The licensee has only used GNF-A fuel at BSEP, and the description in TS 4.2.1 is consistent with the physical characteristics of GNF-A fuel. The licensee proposed a minor change to TS 4.2.1 to revise the description of the fuel assemblies to be compatible with AREVA NP ATRIUM™ 10 fuel. The ATRIUM™ 10 fuel assembly design uses a water channel to increase neutron moderation, rather than the water rods used in GNF-A designs. The TS 4.2.1 description is being modified to reference water channels as well as water rods so that the description is applicable to both GNF-A and AREVA NP fuel.

The criticality design criteria for the SFP racks and new fuel storage racks are addressed in TS 4.3.1.1 and TS 4.3.1.2, respectively. The BSEP Updated Final Safety Analysis Report (UFSAR), Section 9.1.1, “New Fuel Storage,” and Section 9.1.2, “Spent Fuel Storage,” provide criticality criteria. For the SFP racks, the UFSAR specifies that the effective multiplication factor (k_{eff}) will be less than or equal to 0.95, and this criterion is restated in TS 4.3.1.1.c. For the new fuel racks, the UFSAR specifies that the k_{eff} will be less than or equal to 0.95 for flooded conditions and less than or equal to 0.90 for dry conditions, and these criteria are restated in TS 4.3.1.2.b and TS 4.3.1.2.c, respectively. TS 4.3.1.1 and TS 4.3.1.2 also prescribe the use of in-core k_{inf} (multiplication factor based on an infinite array of fuel) criteria, which are used in the GNF-A criticality methodologies. AREVA NP criticality methodologies do not use the in-core k_{inf} , but instead use in-pool k_{eff} criticality criteria and determine the rack k_{eff} by using computer codes, such as KENO, and cycle-specific factors such as fuel enrichment, Gadolinia loadings, fuel types, and the worst (i.e., most conservative) credible conditions. The TS 4.3.1.1 and TS 4.3.1.2 requirements are being modified to make these TSs compatible with the storage of both GNF-A and AREVA NP fuel.

The NRC staff reviewed the acceptability of storing ATRIUM™ 10 fuel at BSEP. The January 22, 2007, submittal did not include details of the acceptability analyses. On July 31, 2007, the NRC staff audited the analyses at the AREVA NP offices in Richland, Washington. The NRC staff developed questions in various technical areas, and requested that the criticality analysis be submitted on the BSEP docket. The licensee provided the requested information by letter dated September 28, 2007.

3.1 Description of the SFP Fuel Storage

The BSEP fuel storage facility consists of two SFPs, one for each unit. Each SFP has fuel storage divided into low and high density sections. The low density sections contain fuel assemblies from the licensee’s H.B. Robinson plant (a pressurized-water reactor (PWR)). There are 160 and 144 H.B. Robinson assemblies in the BSEP Unit 1 and Unit 2 SFPs, respectively. The high density fuel storage system is used for the boiling-water reactor (BWR) assemblies used at BSEP. There are 1803 storage cells in the Unit 1 SFP and 1839 storage cells in the Unit 2 SFP, for a total of 3642.

3.2 Calculational Methodology

Reactivity values (k_{inf}) for in-rack fuel geometries depend on fuel content (amount and enrichment), burnup, and void history. AREVA NP performed fuel depletion calculations using CASMO-4, a multigroup two-dimensional transport code that has been benchmarked by Studsvik (Ref. 6). In-rack geometry reactivity is calculated using the KENO.Va code that is part of the SCALE 4.2 Code System (Ref. 7). Cross section input data for KENO.Va are taken from the 27 group ENDF/B library and adjusted for Uranium resonance corrections using the BONAMI and NITAWL Codes. Both codes have been extensively benchmarked and are generally accepted for reactivity calculations; therefore, the staff finds them acceptable for this application.

3.3 Criticality Safety Analyses

As indicated above, the reactivity for the high density rack storage is calculated using the KENO.Va code using an infinity array and assuming that all locations are loaded with ATRIUM™ 10 fuel. There are B₄C panels between the fuel boxes. This arrangement bounds the actual fuel configuration. All ATRIUM™ 10 fuel assemblies are assumed to have the maximum initial fuel enrichment of 4.5 weight percent (w/o) and eight Gadolinia absorber rods of 4.0 w/o Gd₂O₃. Depletion calculations are performed using the CASMO-4.2 code at various void histories up to 80 percent void history. Reactivity values are calculated as a function of exposure and void fraction for cold, xenon free conditions, for the top and bottom rod configurations, and at 4 degrees Celsius and 100 degrees Celsius. In response to the staff's question, the licensee stated that increasing the void history to 90 percent would have an insignificant effect on the reactivity. The licensee determined that the maximum k_{inf} value is significantly lower than 0.90.

The follow-up calculations were based on the concept of the Reactivity Equivalency at the Beginning of Life (REBOL). The fuel enrichment value for the equivalency was selected at 3.1 w/o. The REBOL bundle has uniform enrichment in all rods, no Gadolinia absorbers and no natural Uranium blanket. The infinite REBOL lattice reactivity (k_{inf}) is about 0.01 higher than the bounding infinite lattice reactivity. Therefore, the REBOL concept is conservative and would account for any uncertainties introduced with the equivalency concept. The licensee also assumed an infinite lattice for the REBOL fuel, thus bounding the reactivity value for a finite configuration.

3.4 Uncertainties

The rack calculations take into account fuel assembly lean, minimum rack separation and fuel positioning (orientation) in the racks. Additional uncertainties are from variation in enrichment, UO₂ density, fuel pellet diameter, clad thickness, fuel pellet void volume, and Gadolinia content. Finally, uncertainties in the steel box tolerances are accounted for. The total value of the uncertainties is a small fraction of Δk_{inf} and is comparable to similar values in the literature. Therefore, the NRC staff considers the uncertainty evaluation results to be acceptable.

3.5 Accident Analysis

The case of a fuel assembly falling on top of the fuel racks was considered. However, the separation due to fuel assembly superstructure is about 12 inches and that does not allow neutronic coupling between the dropped assembly and the fuel in the racks. Therefore, a fuel

assembly lying on top of the racks is inconsequential. Similarly, a fuel assembly misplaced outside the fuel racks stands 18 inches from the stored fuel; thus, it is not able to interact. The staff also notes that fuel assembly orientation is irrelevant, although the fuel is not 1/4-lattice symmetric, since the licensee added a small amount of reactivity in the uncertainty to achieve azimuthal neutrality for the fuel assembly. In addition, the licensee considered the case of a missing (or dropped out) B₄C neutron absorber panel. This is the most reactive event of the accidents that were considered. The results are within the regulatory limits and are acceptable.

3.6 Maximum Rack Assembly Reactivity

The maximum rack assembly reactivity consists of the sum of the REBOL (3.1 w/o enrichment fuel) reactivity increased by the values for uncertainties in the racks, code geometry and cross section uncertainties, accident and abnormal conditions, and an uncertainty multiplier to account for a one-sided 95 percent probability at a 95 percent confidence level (95/95). The results demonstrate that the worst credible k_{eff} for the REBOL fuel is less than or equal to 0.95. As stated above, the REBOL infinite lattice reactivity is higher than the limiting actual reference fuel lattice (ATRIUM™ 10). Therefore, the NRC staff concludes that the reference lattice k_{eff} also remains less than or equal to 0.95, which is within the limits and acceptable.

3.7 Interaction of PWR and BWR Assemblies

As stated previously, the BSEP SFPs are used to store H.B. Robinson PWR fuel. Criticality of the PWR fuel by itself is not subject to this license amendment; however, the staff considered the interaction of the new fuel being stored in the SFP and the PWR fuel that is already there.

In 1981, the licensee submitted a request to expand storage in the SFP. This submittal addressed the issue of interaction between the PWR and BWR fuel. The NRC staff approved the expansion in Amendments 61 and 87 to the BSEP, Units 1 and 2, operating licenses, respectively (Ref. 8). Each fuel storage rack and combination was found to satisfy the limitation of k_{eff} less than or equal to 0.95. The water gap separating the storage racks is 6 inches. The licensee demonstrated that neutronic coupling does not occur between the racks. Since none of the conditions for the approval of Ref. 8 have changed, the NRC staff concludes that it is acceptable to store the PWR and BWR assemblies in adjacent storage racks.

3.8 Mixed BWR Fuel Types

The BSEP SFPs will contain a mixture of GNF-A fuel assemblies (i.e., GE14) and AREVA NP fuel assemblies (i.e., ATRIUM™ 10). The GE14 and ATRIUM™ 10 fuels have similar fuel rod pitch and water volume. Therefore, the neutron spectra are comparable. In addition, the GE14 fuel was analyzed for a 3.0 w/o enrichment that compares with the 3.1 w/o REBOL fuel. Therefore, the ATRIUM™ 10 fuel bounds the thermal and reactivity aspects of the GE14 fuel, and the NRC staff finds that it is acceptable to mix the fuel types.

3.9 New Fuel Storage Vault

The new fuel storage vault is intended for temporary dry storage of fresh fuel assemblies. The vault racks consists of 21 rows, each holding 10 assemblies, for total capacity of 210 assemblies. The vault is in a moderation-controlled area, meaning that hydrogenous media is kept away from the vault. Moderation control is achieved through appropriate administrative

controls, and the vault is provided with a drainage system. Under dry conditions, k_{eff} must remain less than or equal to 0.90, as required by the regulations. Even though the vault is in a moderation-controlled area, the safety analysis assumes that the vault could be flooded. In this case, k_{eff} will remain less than or equal to 0.95, as required by the regulations. The criticality criteria are also stated in Section 9.1.1.3 of the BSEP UFSAR.

The licensee evaluated criticality in the new fuel storage vault using the same methodology as was used for the SFP. The licensee used conservative assumptions regarding fuel enrichment and poison content. The licensee assumed significantly less poison in the new fuel compared to the assumptions for the exposed fuel. This is not realistic but a conservative assumption as far as criticality is concerned. The licensee determined that the criticality in the new fuel storage racks meets the above regulatory limits. Based on the licensee's conservative assumptions and the criticality results, the NRC staff concludes that storage of the AREVA NP fuel in the new fuel storage racks is acceptable.

3.10 Other Considerations

During the audit at AREVA, the NRC staff asked the licensee to address other considerations of storing AREVA NP fuel in the new fuel storage racks and the SFP. The licensee provided the additional information in its submittal dated September 28, 2007.

With respect to the structural (seismic) design of the racks, the licensee stated that the pre-existing analyses encompass fuel designs previously used at BSEP, with weights ranging from 22 pounds less to 31 pounds greater than the weight of the ATRIUM™ 10 fuel. Therefore, the staff concludes that the racks remain qualified with the ATRIUM™ 10 fuel.

With respect to decay heat removal in the SFP, the licensee stated that the peak decay heat will not increase because the AREVA fuel will be operated within the same core power constraints as the current BSEP fuel. Further, the AREVA and GNF-A fuels have been shown to be thermal hydraulically compatible for coresident operation, and the natural circulation flow through the fuel racks is insensitive to the relatively small differences in hydraulic resistance between the various fuel designs. The licensee also stated that CASMO calculations demonstrate that removal of moderator (e.g., by boiling in the racks) would reduce reactivity. Based on the above, the NRC staff concludes that the introduction of ATRIUM™ 10 fuel will not have an adverse impact on the SFP or storage racks.

3.14 Technical Specification Changes

The licensee proposed to change TS 4.2.1 to modify the description of the fuel assemblies. The licensee proposed to clarify that the fuel would use water rods, which is the terminology used for the GNF-A fuel, or water channels, which is the terminology for the AREVA NP fuel. This change reflects the description of ATRIUM™ 10 fuel and is acceptable.

The licensee proposed to eliminate the k_{inf} criteria from TS 4.3.1.1.b and TS 4.3.1.2.a. These criteria were used for the GNF-A criticality analysis methodology and were required to be met for BWR fuel currently at BSEP. These criteria are not used in the AREVA criticality analysis methodology. The licensee elected to remove these criteria from the TSs rather than have separate criteria for the different fuel types. These criteria are no longer relevant to the safety

and/or the operation of the new fuel vault or the SFP. Therefore, the NRC staff concludes that removing these criteria from the TSs is acceptable.

4.0 SUMMARY

The NRC staff reviewed the submitted information regarding the characteristics of the AREVA NP ATRIUM™ 10 fuel and its suitability to be stored in the SFPs and the new fuel vaults at BSEP, Units 1 and 2. The purpose of the review was to establish criticality safety. The heat transfer and structural (seismic) aspects of the SFP and vault storage did not need to be reviewed in detail due to similarity of the new fuel to the GE14 fuel for which the existing approvals were issued. The criticality calculations were performed using benchmarked and staff-approved codes. The results demonstrated that the reactivity values are within the required limits in 10 CFR 50.68, the 10 CFR Part 50 Appendix A, and NUREG-0800, Sections 9.1.1 and 9.1.2. The calculations accounted for all conservatism prescribed in the regulations and the appropriate guidance cited in the Section 2.0 of this Safety Evaluation. Therefore, the staff finds the storage of AREVA fuel and the proposed TS changes acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of North Carolina official was notified of the proposed issuance of the amendments. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (72 FR 49742). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

8.0 REFERENCES

1. Letter from J. Scarola, Progress Energy Carolinas, Inc., to NRC, "Request for License Amendment Regarding Fuel Design and Storage Requirements for AREVA NP Fuel," dated January 22, 2007.

2. Letter from J. Scarola, Progress Energy Carolinas, Inc., to NRC, "Additional Information Regarding Request for License Amendment Regarding Fuel Design and Storage Requirements for AREVA NP Fuel," dated September 28, 2007.
3. Regulatory Guide 1.13, "Spent Fuel Storage Facility Design Basis," Revision 2, NRC, March 2007.
4. NUREG-0800, "Standard Review Plan," Revision 3, NRC, March 2007.
5. Letter from L. Kopp to T. Collins, NRC, "Guidance on the Regulatory Requirements for Criticality Analysis of Fuel Storage at Light-Water Reactor Power Plants," August 19, 1998.
6. EMF-2158(P)(A), Revision 0, "Methodology for Boiling Water Reactors: Evaluation and Validation of CASMO-4/MICROBURN-B2," Siemens Power Corporation, October 1999.
7. SCALE-4.2, "A modular System for Performing Standardized Computer Analyses for Licensing Evaluation," Oak Ridge National Laboratory, revision dated December 1993.
8. Letter from M. Grotenhuis, NRC, to E.E. Utlely, Carolina Power and Light Company, "Commission Approval of License Amendments 61 and 87 to Facility Operating Licenses Nos. DPR-71 and DPR-62 for Brunswick Steam Electric Plant," December 15, 1983.

Principal Contributor: Lambros Lois

Date: November 27, 2007