February 21, 2008

Mr. Bruce H. Hamilton
Vice President, Oconee Site
Duke Power Company LLC
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3, ISSUANCE OF AMENDMENTS REGARDING USE OF FIBER-REINFORCED POLYMER (FRP) (TAC NOS. MD2129, MD2130, AND MD2131)

Dear Mr. Hamilton:

The Nuclear Regulatory Commission has issued the enclosed Amendment Nos. 360, 362, and 361 to Renewed Facility Operating Licenses DPR-38, DPR-47, and DPR-55, for the Oconee Nuclear Station, Units 1, 2, and 3, respectively. The amendments consist of changes to the Updated Final Safety Analysis Report (UFSAR) in response to your application dated June 1, 2006, as supplemented by letters dated March 14, October 8, and October 30, 2007.

These amendments authorize a revision to the UFSAR to accommodate the use of the FRP to strengthen certain existing masonry walls to withstand the pressure loads resulting from a tornado.

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/

Leonard N. Olshan, Sr. Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosures:
1. Amendment No. 360 to DPR-38
2. Amendment No. 362 to DPR-47
3. Amendment No. 361 to DPR-55
4. Safety Evaluation

cc w/encls: See next page

February 21, 2008

Mr. Bruce H. Hamilton
Vice President, Oconee Site
Duke Power Company LLC
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3, ISSUANCE OF AMENDMENTS REGARDING USE OF FIBER-REINFORCED POLYMER (FRP) (TAC NOS. MD2129, MD2130, AND MD2131)

Dear Mr. Hamilton:

The Nuclear Regulatory Commission has issued the enclosed Amendment Nos. 360, 362, and 361 to Renewed Facility Operating Licenses DPR-38, DPR-47, and DPR-55, for the Oconee Nuclear Station, Units 1, 2, and 3, respectively. The amendments consist of changes to the Updated Final Safety Analysis Report (UFSAR) in response to your application dated June 1, 2006, as supplemented by letters dated March 14, October 8, and October 30, 2007.

These amendments authorize a revision to the UFSAR to accommodate the use of the FRP to strengthen certain existing masonry walls to withstand the pressure loads resulting from a tornado.

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/
Leonard N. Olshan, Sr. Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosures:
1. Amendment No. 360 to DPR-38
2. Amendment No. 362 to DPR-47
3. Amendment No. 361 to DPR-55
4. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

Public	RidsAcrsAcnwMailCenter
LPLII-1 R/F	GHill (6 hard copies)
RidsNrrDorlLp2-1 (MWong)	RidsNrrDirsItsb (TKobetz)
RidsNrrPMLOlshan (hard copy)	RidsRgn2MailCenter (JMoorman)
RidsNrrLAMO=Brien (hard copy)	RidsNrrDorlDpr
RidsOgcRp	RidsNrrDeEmcb (KManoly)
RidsNroDe (JMa)	RidsNroDcSeb1 (BThomas)

Package No.: ML080320062 License Amendment No.: ML080320065
Tech Spec No.: ML080320071 * Transmitted by SE dated

OFFICE	NRR/LPL2-1/PM	NRR/LPL2-1/LA	NRR/BMCB/BC	OGC NLO	NRR/LPL2-1/BC
NAME	LOlshan	MO'Brien	*KManoly	MBaty	Mwong
DATE	2/ 11 /08	2 / 11 /08	1/31/08	2 / 14/08	2 / 19 /08

OFFICIAL RECORD COPY

DUKE POWER COMPANY LLC

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 360
Renewed License No. DPR-38

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the Oconee Nuclear Station, Unit 1 (the facility), Renewed Facility Operating License No. DPR-38 filed by the Duke Power Company LLC (the licensee), dated June 1, 2006, and supplemented March 14, October 8, and October 30, 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 as 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 set forth in 10 CFR Chapter I;

   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 hereby amended as indicated in the attachment to this license amendment, and Paragraph 3.B of Renewed Facility Operating License No. DPR-38 is hereby amended to read as follows:

   B. Technical Specifications

      The Technical Specification contained in Appendix A, as revised through Amendment No. 360, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. Further, Renewed Facility Operating License No. DPR-38 is hereby amended to authorize revision to the Updated Final Safety Analysis Report as required by 10 CFR 50.71(e) to accommodate the use of fiber-reinforced polymer.

4. This license amendment is effective as of its date of issuance and shall be implemented by December 2010.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Melanie C. Wong, Acting Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License No. DPR-38
and the Technical Specifications

Date of Issuance: February 21, 2008

DUKE POWER COMPANY LLC

DOCKET NO. 50-270

OCONEE NUCLEAR STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 362
Renewed License No. DPR-47

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the Oconee Nuclear Station, Unit 2 (the facility), Renewed Facility Operating License No. DPR-47 filed by the Duke Power Company LLC (the licensee), dated June 1, 2006, and supplemented March 14, October 8, and October 30, 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 as 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 set forth in 10 CFR Chapter I;

   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 hereby amended as indicated in the attachment to this license amendment, and Paragraph 3.B of Renewed Facility Operating License No. DPR-47 is hereby amended to read as follows:

   B. Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 362, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. Further, Renewed Facility Operating License No. DPR-47 is hereby amended to authorize revision to the Updated Final Safety Analysis Report as required by 10 CFR 50.71(e) to accommodate the use of fiber-reinforced polymer.

4. This license amendment is effective as of its date of issuance and shall be implemented by December 2010.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Melanie C. Wong, Acting Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License No. DPR-47
and the Technical Specifications

Date of Issuance: February 21, 2008

DUKE POWER COMPANY LLC

DOCKET NO. 50-287

OCONEE NUCLEAR STATION, UNIT 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 361
Renewed License No. DPR-55

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the Oconee Nuclear Station, Unit 3 (the facility), Renewed Facility Operating License No. DPR-55 filed by the Duke Power Company LLC (the licensee), dated June 1, 2006, and supplemented March 14, October 8, and October 30, 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 as 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 set forth in 10 CFR Chapter I;

   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 hereby amended as indicated in the attachment to this license amendment, and Paragraph 3.B of Renewed Facility Operating License No. DPR-55 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 361, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. Further, Renewed Facility Operating License No. DPR-55 is hereby amended to authorize revision to the Updated Final Safety Analysis Report as required by 10 CFR 50.71(e) to accommodate the use of fiber-reinforced polymer.

4. This license amendment is effective as of its date of issuance and shall be implemented by December 2010.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Melanie C. Wong, Acting Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License No. DPR-55
and the Technical Specifications

Date of Issuance: February 21, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 360

RENEWED FACILITY OPERATING LICENSE NO. DPR-38

DOCKET NO. 50-269

AND

TO LICENSE AMENDMENT NO. 362

RENEWED FACILITY OPERATING LICENSE NO. DPR-47

DOCKET NO. 50-270

AND

TO LICENSE AMENDMENT NO. 361

RENEWED FACILITY OPERATING LICENSE NO. DPR-55

DOCKET NO. 50-287

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

Remove Pages	Insert Pages
Licenses	Licenses
License No. DPR-38, page 3	License No. DPR-38, page 3
License No. DPR-47, page 3	License No. DPR-47, page 3
License No. DPR-55, page 3	License No. DPR-55, page 3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 360 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-38

AMENDMENT NO. 362 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-47

AND

AMENDMENT NO. 361 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-55

DUKE POWER COMPANY LLC

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DOCKET NOS. 50-269, 50-270, AND 50-287

1.0 INTRODUCTION

By application dated June 1, 2006 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML061580078), as supplemented by letters dated March 14, 2007 (ADAMS Accession No. ML070820365), October 8, 2007 (ADAMS Accession No. ML072850150), and October 30, 2007 (ADAMS Accession No. ML073090095), Duke Power Company LLC (Duke, the licensee), requested changes to the Updated Final Safety Analysis Report (UFSAR) for the Oconee Nuclear Station, Units 1, 2, and 3 (Oconee 1/2/3). The supplements dated March 14, October 8, and October 30, 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 July 18, 2006 (71 FR 40745).

The proposed changes would revise the UFSAR to incorporate the use of a fiber-reinforced polymer (FRP) system to strengthen certain existing masonry walls, located in the Oconee 1/2/3 auxiliary buildings, to withstand the pressure loads resulting from a tornado.

2.0 REGULATORY EVALUATION

The ability of the existing masonry walls to withstand tornado-induced pressure and wind loadings was evaluated in accordance with NUREG-0800, Standard Review Plan (SRP), Section 3.8.4, "Other Seismic Category I Structures," Rev.1 - July 1981; "Building Code Requirements for Concrete Masonry Structures," American Concrete Institute (ACI) 531-79 and Commentary ACI-531R-79; and Chapter 3 of the Oconee UFSAR, December 31, 2004.

3.0 TECHNICAL EVALUATION

The masonry walls discussed in the license amendment request (LAR) are non-structural elements, and are single and multiple wythe in-fill panels constructed of hollow or grouted concrete blocks or constructed of solid concrete blocks. The typical FRP application will consist of a matrix of fiber bonded directly to existing masonry walls with a polymer. The LAR stated that future use of FRP, as proposed, will be predicated on the satisfactory completion of qualification testing and commercial grade dedication of the selected FRP system and the incorporation of subsequent periodic surveillance requirements into existing plant programs.

The detailed design, qualification, installation and inspection, and inservice surveillance methods for the FRP system are contained in the LAR. The Nuclear Regulatory Commission (NRC) staff reviewed the licensee's proposed methods and data provided by the licensee that had been acquired from a number of industry performance tests that are relevant to the masonry walls located within the Oconee 1/2/3 auxiliary buildings. The acceptability and applicability of the licensee's methods for design, qualification, installation and inspection, and inservice surveillance are discussed below.

3.1 Applicability of the FRP System Design Method

The licensee's FRP design method is only applicable to the non-structural concrete masonry walls located in the Oconee 1/2/3 auxiliary buildings. It is not applicable to the non-structural solid brick masonry walls located in these auxiliary buildings.

3.2 The FRP System Design Method

The design is based on a working stress method and assumes a one-way span behavior for masonry walls to resist the flexural stress generated by a tornado. In its October 30, 2007, response to the NRC staff's request for additional information (RAI), the licensee stated that it will limit the masonry allowable flexural compressive stress to 70 percent of the masonry compressive strength, which is intended to preclude the brittle failure mode of masonry walls. The licensee also stated in its response to the RAI that it will comply with the NRC staff's request and limit the reinforcement index to 70 percent, which is intended to preclude the shear failure of the FRP-strengthened masonry walls. The licensee stated that the masonry allowable shear stress will be limited to 50 psi. The licensee stated that both ACI 531-79 and ACI 530-05, "Building Code Requirements for Masonry Structures," indicate an upper limit of 50 psi for masonry allowable shear stress for flexural members without shear reinforcement. The NRC staff concludes that the licensee's compliance with these limits on masonry allowable flexural compressive stress, reinforcement index, and masonry allowable shear stress will provide additional assurance that the FRP-reinforced masonry walls will withstand the uniform pressure loads resulting from a tornado. Therefore, the NRC staff concludes that the FRP System design method is acceptable. In addition, the design procedure includes a provision to evaluate the flexural stress generated due to the corner effect of masonry wall panels, and to reinforce them, if warranted.

3.3 The FRP System Qualification Method

The licensee has committed that qualification tests and reporting for the selected FRP system will be performed in accordance with "Interim Criteria for Concrete and Reinforced and

Unreinforced Masonry Strengthening Using Fiber-Reinforced Polymer (FRP) Composite Systems," International Code Council (ICC) AC125, June 2003. The licensee has committed to perform and document a technical evaluation of the selected FRP system (fibers and polymeric resin) to demonstrate the following:

> (1) The selected FRP system qualifies as commercial grade in accordance with Duke's Supply Chain Directive (SCD) 230, "Commercial Grade Items";
>
> (2) The supplier is capable of supplying a quality product in accordance with SCD 230; and
>
> (3) The quality of the selected FRP system has been evaluated in accordance with ICC AC125; and, therefore, its quality can be reasonably assured.

The NRC staff concludes that the FRP system qualification method is acceptable because it complies with 2CC AC125 and Duke's SCD 230.

3.4 The FRP System Installation and Inspection Method

The licensee commits to use technical procedures to test the concrete masonry substrate, and to control the installation and inspection of the FRP system onto existing masonry walls, in accordance with ICC AC125; "Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures," ACI 440.2R-02; and "Interim Criteria for Inspection and Verification of Concrete and Reinforced and Unreinforced Masonry Strengthing Using Fiber-Reinforced Polymer (FRP) Composite Systems," ICC AC 178, July 2003.

The NRC staff concludes that the FRP system installation and inspection method is acceptable because it complies with these three standards.

3.5 The FRP System Inservice Surveillance Method

The licensee's inservice inspection of the FRP system will be performed on a nominal 5-year interval, which is the standard interval defined in Duke's Engineering Directive Manual EDM-140 for monitoring and assessing the condition of civil engineering structures and components. This inspection frequency may be reduced to a nominal 10-year interval with appropriate justification based on the structure, environment, and previous inservice inspection results. The inspection includes visual inspections for changes in color, debonding, peeling, blistering, cracking, deflection and other anomalies. The inspection also includes tension adhesion testing of cored samples using methods specified in "Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers," American Society for Testing Materials (ASTM) D4541, or "Building Code Requirements for Masonry Structures," ACI 530R-02. Records of the inservice inspection reports will be considered Quality Assurance Records in accordance withTitile 10 of the Code of *Federal Regulations* (10 CFR), Part 50, Appendix B, Section XVII, "Quality Assurance Records." All inspection reports will be maintained for the life of the plant.

The NRC staff concludes that the FRP system inservice surveillance method is acceptable because it complies with Duke's EDM-140, ASTM P4541, ACI 530R-02, and 10 CFR, Part 50, Appendix B, Section XVII.

Therefore, based on the NRC staff's review of the licensee's methods for design, qualification, installation and inspection, and inservice surveillance, the NRC staff concludes that the proposed FRP system is acceptable for use to strengthen the non-structural concrete masonry walls in the Oconee 1/2/3 auxiliary buildings to withstand the pressure loads resulting from a tornado. This acceptance does not apply to the non-structural solid brick masonry walls in the Oconee 1/2/3 auxiliary buildings.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of facility components 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 (71 FR 40745, dated July 18, 2006). 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.

6.0 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.

Principal Contributor: J. Ma, NRO

Date: February 21, 2008

Oconee Nuclear Station, Units 1, 2, and 3

cc:

Mr. Bruce H. Hamilton
Vice President, Oconee Site
Duke Power Company LLC
7800 Rochester Highway
Seneca, SC 29672

Ms. Lisa F. Vaughn
Associate General Counsel and Managing Attorney
Duke Energy Carolinas, LLC
526 South Church Street - EC07H
Charlotte, North Carolina 28202

Manager, LIS
NUS Corporation
2650 McCormick Dr., 3rd Floor
Clearwater, FL 34619-1035

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
7812B Rochester Highway
Seneca, SC 29672

Mr. Henry Porter, Director
Division of Radioactive Waste Management
Bureau of Land and Waste Management
Dept. of Health and Env. Control
2600 Bull St.
Columbia, SC 29201-1708

Mr. Michael A. Schoppman
Framatome ANP
1911 North Ft. Myer Dr.
Suite 705
Rosslyn, VA 22209

Mr. B. G. Davenport
Regulatory Compliance Manager
Oconee Nuclear Site
Duke Energy Corporation
ON03RC
7800 Rochester Highway
Seneca, SC 29672

Mr. Leonard G. Green
Assistant Attorney General
NC Department of Justice
P.O. Box 629
Raleigh, NC 27602

Mr. R. L. Gill, Jr.
Manager - Nuclear Regulatory Issues and Industry Affairs
Duke Power Company LLC
526 S. Church St.
Mail Stop EC05P
Charlotte, NC 28202

Division of Radiation Protection
NC Dept of Environment, Health, & Natural Resources
3825 Barrett Dr.
Raleigh, NC 27609-7721

Mr. Peter R. Harden, IV
VP-Customer Relations and Sales
Westinghouse Electric Company
6000 Fairview Road
12th Floor
Charlotte, NC 28210

Mr. Henry Barron
Group Vice President, Nuclear Generation and Chief Nuclear Officer
P.O. Box 1006-EC07H
Charlotte, NC 28201-1006

Mr. Charles Brinkman
Director, Washington Operations
Westinghouse Electric Company
12300 Twinbrook Parkway, Suite 330
Rockville, MD 20852

Ms. Kathryn B. Nolan
Senior Counsel
Duke Energy Carolinas, LLC
526 South Church Street - EC07H
Charlotte, NC 28202