February 13, 2006

Mr. L. M. Stinson
Vice President - Farley Project
Southern Nuclear Operating
Company, Inc.
P.O. Box 1295
Birmingham, AL 35201-1295

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 2 — ISSUANCE OF AMENDMENT REGARDING REVISION TO THE UPDATED FINAL SAFETY ANALYSIS REPORT (TAC NO. MC5719)

Dear Mr. Stinson:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 162 to Renewed Facility Operating License No. NPF-8 for the Joseph M. Farley Nuclear Plant, Unit 2. The amendment consists of an authorization of the licensee to make changes to the Updated Final Safety Analysis Report (UFSAR) in response to your application dated January 19, 2005, as supplemented on June 9 (two letters) and November 18, 2005.

The amendment revises the UFSAR to reflect the utilization of fire-rated electrical Mineral Insulated cables in lieu of Appendix R, Section III.G.2 1-hour rated fire barriers.

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/

Robert E. Martin, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-364

Enclosures:
1. Amendment No. 162 to NPF-8
2. Safety Evaluation

cc w/encl: See next page

February 13, 2006

Mr. L. M. Stinson
Vice President - Farley Project
Southern Nuclear Operating
Company, Inc.
P.O. Box 1295
Birmingham, AL 35201-1295

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 2 — ISSUANCE OF AMENDMENT REGARDING REVISION TO THE UPDATED FINAL SAFETY ANALYSIS REPORT (TAC NO. MC5719)

Dear Mr. Stinson:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 162 to Renewed Facility Operating License No. NPF-8 for the Joseph M. Farley Nuclear Plant, Unit 2. The amendment consists of an authorization of the licensee to make changes to the Updated Final Safety Analysis Report (UFSAR) in response to your application dated January 19, 2005, as supplemented on June 9 (two letters) and November 18, 2005.

The amendment revises the UFSAR to reflect the utilization of fire-rated electrical Mineral Insulated cables in lieu of Appendix R, Section III.G.2 1-hour rated fire barriers.

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/

Robert E. Martin, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-364

Enclosures:
1. Amendment No. 162 to NPF-8
2. Safety Evaluation

cc w/encl: See next page

DISTRIBUTION:

Public	RidsAcrsAcnwMailCenter	BKS1 (BSingal)
LPL2-1 R/F	GHill(2 hard copies)	RidsOgcRp
RidsNrrDorlLplc(EMarinos)	RidsNrrDirsItsb(TBoyce)	AKlein
RidsNrrPMRMartin(hard copy)	THarrison	
RidsNrrLARSola(hard copy)	RidsRgn2MailCenter(MWidmann)	

Amendment No. ML060270011 NRR-058

OFFICE	NRR/LPL2-1/PM	NRR/LPL2-1/LA	OGC/NLO	NRR/LPL2-1/BC
NAME	RMartin	RSola	SBrock	EMarinos
DATE	2/2/06	2/1/06	2/6/06	2/13/06

OFFICIAL RECORD COPY

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

ALABAMA POWER COMPANY

DOCKET NO. 50-364

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 162
Renewed License No. NPF-8

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

   A. The application for amendment by Southern Nuclear Operating Company, Inc. (Southern Nuclear), dated January 19, 2005, as supplemented on June 9 (two letters) and November 18, 2005, 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 license 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. Changes to the Farley Updated Final Safety Analysis Report (UFSAR) to reflect the utilization of fire-rated electrical Mineral Insulated cables in lieu of Appendix R, Section III.G.2, 1-hour rated fire barriers, as set forth in the application for amendment dated January 19, 2005, as supplemented on June 9 (two letters and November 18, 2005, are authorized. The licensee shall submit the update of the UFSAR authorized by this amendment in accordance with 10 CFR 50.71(e).

3. This license amendment is effective as of its date of issuance and shall be incorporated into the UFSAR at the time of its next update.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Evangelos C. Marinos, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Date of Issuance: February 13, 2006

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 162 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-8

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 2

DOCKET NO 50-364

1.0 INTRODUCTION

By letter dated January 19, 2005, as supplemented on June 9 (two letters) and November 18, 2005, the Southern Nuclear Operating Company, Inc. (SNC) submitted a request for authorization to change the Updated Final Safety Analysis Report (UFSAR) for Joseph M. Farley Nuclear Plant, (FNP), Unit 2 (References 2, 3, 4 and 5). The requested changes would revise the UFSAR to reflect the utilization of fire-rated electrical cable produced by Meggitt Safety System, Inc. (previously known as Whittaker Electronic Resources Unit of Whittaker Electronic Systems), for several cables in Fire Areas 2-013 and 2-042 associated with safe shutdown control circuits. The licensee proposes the use of these fire-rated electrical cables in lieu of the alternatives specified in Section III.G.2 of Appendix R.

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," establishes fire protection features required to satisfy General Design Criterion 3, "Fire protection," of Appendix A to 10 CFR Part 50 with respect to certain generic issues for nuclear power plants licensed to operate prior to January 1, 1979. Joseph M. Farley Nuclear Plant, Unit 2 was licensed to operate subsequently to January 1, 1979, and thus, is not directly subject to Appendix R. However, FNP, Unit 2 is required to meet its license condition 2.C(6) as follows:

> (6) Fire Protection
>
> Southern Nuclear shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report for the facility, which implements the fire protection requirements of 10 CFR 50.48 and 10 CFR Appendix R. Southern Nuclear may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown.

Therefore, based on the date of issuance of the FNP, Unit 2 license, the licensee's request is for authorization to change Chapter 9 of its UFSAR. The proposed changes to Chapter 9 are provided in Enclosure 2 of the licensee's application dated January 19, 2005 (licensee letter

NL-04-2361). Upon approval, the UFSAR changes are subject to license condition 2.C(6), as described above.

The June 9 and November 18, 2005, letters provided clarifying information that did not change the January 19, 2005, application and the initial proposed no significant hazards consideration determination.

2.0 REGULATORY EVALUATION

Section III.G.2 of 10 CFR Part 50, Appendix R, provides fire protection requirements for electrical cables located within the same fire area whose failure could cause the maloperation of redundant trains of systems necessary to achieve and maintain hot shutdown conditions. These areas are required to have protection features such that one of the redundant trains will be free of fire damage in the event of a fire. One method described in Section III.G.2 for ensuring compliance with this requirement is to enclose the cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, an area-wide automatic fire suppression and detection system shall be installed in the fire area.

A postulated fire in Fire Area 2-013 or 2-042 could cause loss of offsite power; both fire areas contain cable bus ducts from the startup transformers to both redundant trains of the 4 kilovolt (kV) Appendix R safe shutdown (SSD) busses. A postulated fire in either of these fire areas could also potentially impact the function of the Train B 4kV Emergency Diesel Generator (DG) 2B control circuitry. The majority of the Train A onsite electrical power system components required for Appendix R SSD are not located in Fire Area 2-013 or 2-042. The following Train A onsite power system related SSD circuits located in Fire Areas 2-013 and 2-042 will be protected by the fire-rated electrical cable along with area-wide automatic fire suppression and detection.

1. Protection of control circuitry that could potentially disable the supply of the onsite power from the train A 4kV Emergency DGs 1-2A & 1-C, or disable supply of Train A onsite power due to inadvertent loading of Electronic Switching System (ESS) loads onto DG1-C:

    a) The control interlocks for the automatic alignment of the Train A Swing Emergency DG 1C Incoming Breaker 1-DH07 or 2-DH07 to provide onsite AC power due to loss of offsite power to the shutdown buses.

    b) The control interlocks for the automatic alignment of the Train A Swing Emergency DG 1-2A Incoming Breaker 1-DF08 or 2-DF08 to provide onsite AC power due to loss of offsite power to the shutdown buses.

    c) The control interlocks for the automatic alignment of Unit 1 600 volt (V) Load Center 1D Breaker 1-ED13 or Unit 2 600V Load Center 2D Breaker 2-ED13 to Motor Control Center (MCC) 1S (power to the Train A Swing Emergency DG 1-2A auxiliaries) so that the MCC is aligned to the same DG 1-2A.

d) The control interlocks from Unit 2 ESS Sequencer that blocks Unit 1 ESS Sequencer on a Unit 2 safety injection actuation signal (This signal is to prevent inadvertent loading of ESS loads on smaller DG1C).

e) The control interlock from Unit 1 ESS Sequencer that blocks Unit 2 ESS Sequencer on a Unit 1 safety injection actuation signal (This signal is to prevent inadvertent loading of ESS loads on smaller diesel generator 1C).

A 1-hour rated fire barrier as described in Section III.G.2 of 10 CFR Part 50, Appendix R is not provided. Instead, these credited Train A components will utilize fire-rated electrical cables (Mineral Insulated (MI) cables). This fire-rated electrical cable has been tested in accordance with American Society for Testing Materials (ASTM) E-119, "Standard Test Methods for Fire Tests of Building Construction Materials."

The Nuclear Regulatory Commission (NRC) staff reviewed this issue with respect to determining that the fire-rated electrical cables would be capable of providing equivalent level of protection as would be provided by a 1-hour barrier as described by 10 CFR part 50, Appendix R, Section III.G.2.

3.0 TECHNICAL EVALUATION

The licensee provided copies of the test, "Appendix R, 1-hour Fire Resistive Control Cable Test" dated August 11, 2004, in its submittal.

The cables in FNP, Unit 2 are used as control circuit applications and are rated at 125 volts direct-current (VDC). The licensee's report, listed above, includes the fire test performance results for eight conductor #12 AWG Meggitt Safety Systems electrical cables with factory splices and several support systems and attachment methods, when exposed to the ASTM E-119 time-temperature heating curve for a period of one hour.

The NRC staff concludes that, for the specific application of this material, the licensee has adequately demonstrated that this fire-rated electrical cable will perform in an equivalent manner when compared to a 1-hour rated fire barrier for this use.

3.1.1 Megger Testing

The fire-rated electrical cables at FNP were tested for use in low voltage control circuits. Megger testing was conducted at 500 VDC to obtain conductor-to-conductor and conductor-to-ground insulation resistance values, before the fire test, during the fire test, and after the hose stream test. To ensure that the conductor-to-conductor and conductor-to-ground insulation resistance (IR) readings were obtained for all conductor combinations at the peak ASTM E-119 1-hour test temperature, the first test was extended for an additional 38 minutes and 12 seconds with the furnace temperature held as close as possible to 1700 degrees Farenheit until all IR values were recorded. Obtaining insulation resistance values during the fire test by the test method applied provided conservative test results that meet the fire megger testing requirements of Generic Letter 86-10, Supplement 1, for the FNP, Unit 2 specific 1-hour rated control cable application. The NRC staff finds, based on the megger testing results, that the insulation resistance values are acceptable for the specific application at FNP, Unit 2.

3.1.2 Minimum Insulation Resistance Value

The licensee completed a plant circuit specific analysis and concluded that the control circuit protective devices will not trip during a fire event with an IR value of 5.7 mega-ohms/foot (MΩ/ft). The minimum IR value recorded during the fire test was 0.8 MΩ, and with 24.176 feet of cable inside the furnace, that equated to 19.3 MΩ/ft. This far exceeds the Farley specific minimum acceptance value of 5.7 MΩ/ft.

The NRC staff concludes that, based on the information provided, the minimum IR value recorded during testing is acceptable for the specific application at FNP, Unit 2.

3.1.3 Mechanical Damage Protection

Rated 1-hour electrical cable raceway fire barriers are tested in a furnace and subject to a hose stream test that ensures the raceway and the barriers will stay in place following a fire exposure. The fire-rated electrical cables were tested in a furnace and were subjected to a hose stream. Since the fire-rated electrical cables themselves are the barriers, any mechanical damage that occurs to the cables may cause the cables to fail. The licensee's letter dated June 9, 2005, stated that the areas where the fire-rated electrical cables are routed, are protected with area-wide automatic fire suppression and detection systems, as required by Appendix R Section III.G.2. In addition, the routing for each fire-rated electrical cable was established by plant walk-downs to protect against potential physical hazards. The licensee stated that the fire-rated electrical cables are also safety related and will be installed to meet the FNP routing requirements for Class 1E cable protection from physical hazards. The fire-rated electrical cables are only routed in safety related Class 1 structures, and all safety related and non-safety related equipment and components in these structures are seismically supported.

The NRC staff concludes, based on the information provided, that there is adequate protection from mechanical damage to demonstrate equivalence to a raceway fire barrier system for the specific application at FNP, Unit 2.

3.1.4 Galvanized Supports

When in contact with galvanized supports, fire-rated electrical cable produced by Meggitt Safety Systems, Inc., has been reported to experience degradation due to liquid metal embrittlement. This degradation occurs at the positions where the galvanized supports are in direct contact with the stainless steel cable jacket. Section 4, subsection j of Meggitt Safety Systems engineering document, "Unpacking, Inspection, Installation and Standard Practices fo 8/C #12 AWG Si 2400 Fire-rated Cable for J.M. Farley Nuclear Plant, Revision D" states that "SI 2400 Fire Cable may be routed in cable trays; Stainless steel trays are recommended. Cable should not be installed in galvanized trays and should NOT be in direct contact with galvanized or aluminum trays or structures."

The NRC staff concludes, based on the information provided in the engineering document, that the installation standards adequately address the concern with galvanized supports for the specific application at FNP, Unit 2.

3.1.5 Defense-in-Depth

The following are the fire protection defense-in-depth objectives: 1) to prevent fires from starting; 2) to detect rapidly, control, and extinguish promptly those fires that do occur; and 3) to provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant. The licensee stated that Fire Areas 2-013 and 2-042 are provided with area-wide automatic fire suppression and detection systems. The use of fire-rated electrical cables is a substitute for 1-hour rated fire barriers that are required in 10 CFR Part 50, Appendix R, and supports the third defense-in-depth objective. For this specific application, the licensee has demonstrated that the fire-rated electrical cables used are a suitable alternative to the 1-hour rated fire barrier as required by 10 CFR part 50, Appendix R.

4.0 CONCLUSION

The NRC staff finds that the licensee has adequately demonstrated that the protection provided by the fire-rated electrical cable in this specific application is equivalent to the protection provided by a one hour rated fire barrier. The licensee stated that Fire Areas 2-013 and 2-042 are provided with area-wide automatic fire suppression and detection systems. Based on the NRC staff's review, and circumstances described above, the staff finds that the deviation from the license condition commitments to 10 CFR part 50, Appendix R, Section III.G.2 to the extent that it requires protection of cables of one redundant train of safe shutdown equipment by a one hour rated fire barrier, for Fire Areas 2-013 and 2-042, is acceptable.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes 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 amendment involves 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 amendment involves no significant hazards consideration, and there has been no public comment on such finding (70 FR 21464). Accordingly, the amendment meets 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 amendment.

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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

1. Letter NL-04-2357 from SNC to NRC Document Control Desk, Request for Exemption from Fire Protection Requirements for FNP, Unit 1, January 19, 2005, ML050240389.
2. Letter NL-04-2361 from SNC to NRC Document Control Desk, Final Safety Analysis Report Change Request for Fire Protection Requirements for FNP Unit 2, January 19, 2005, ML050240365.
3. Letter NL-05-0937 from SNC to NRC Document Control Desk, Providing Meggitt Safety Systems Inc. test report, June 9, 2005, ML051640368.
4. Letter NL-05-0960 from SNC to NRC Document Control Desk, Response to Request for Additional Information, June 9, 2005, ML051640200.
5. Letter NNL-05-1975 from SNC to NRC Document Control Desk, Providing Meggitt Safety Systems, Inc. reports, November 18, 2005, ML053250025.

.

Principal Contributors: Travis Harrison
Alex Klein

Date: February 13. 2006

Joseph M. Farley Nuclear Plant, Units 1 & 2

cc:

Mr. J. R. Johnson
General Manager
Southern Nuclear Operating Company, Inc.
P.O. Box 470
Ashford, AL 36312

William D. Oldfield
SAER Supervisor
Southern Nuclear Operating Company, Inc.
P.O. Box 470
Ashford, AL 36312

Mr. B. D. McKinney, Licensing Manager
Southern Nuclear Operating Company, Inc.
P.O. Box 1295
Birmingham, AL 35201-1295

Mr. M. Stanford Blanton
Balch and Bingham Law Firm
P.O. Box 306
1710 Sixth Avenue North
Birmingham, AL 35201

Mr. J. Gasser
Executive Vice President
Southern Nuclear Operating Company, Inc.
P.O. Box 1295
Birmingham, AL 35201

State Health Officer
Alabama Department of Public Health
434 Monroe St.
Montgomery, AL 36130-1701

Chairman
Houston County Commission
P.O. Box 6406
Dothan, AL 36302

Resident Inspector
U.S. Nuclear Regulatory Commission
7388 N. State Highway 95
Columbia, AL 36319