UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

May 12, 2010

EA-10-009

Mr. Dennis R. Madison
Vice President
Southern Nuclear Operating Company, Inc.
Edwin I. Hatch Nuclear Plant
11028 Hatch Parkway North
Baxley, GA 31513

SUBJECT: FINAL SIGNIFICANCE DETERMINATION OF WHITE FINDING AND NOTICE OF VIOLATION (NRC INSPECTION REPORT NO. 05000366/2010006), EDWIN I. HATCH NUCLEAR PLANT UNIT 2

Dear Mr. Madison:

This letter provides you the final significance determination of the preliminary Greater than Green finding discussed in NRC Inspection Report No. 05000321/2009005 and 05000366/2009005, dated February 12, 2010 (ML100430494). The inspection finding was assessed using the NRC's Significance Determination Process and was preliminarily characterized as Greater than Green, which represents a finding with at least low to moderate safety significance, that may require additional NRC inspection. The finding involved the failure to satisfy the requirements of Technical Specification (TS) 5.4, Procedures, to establish and perform preventive maintenance activities to replace electrolytic capacitors prior to their failure. The NRC's inspection report also identified an apparent violation (AV) corresponding to this finding.

In lieu of requesting a Regulatory Conference, Southern Nuclear Operating Company, Inc., (SNC) provided a written response dated March 19, 2010 (ML101190363). In the response, SNC did not dispute the AV or the cross-cutting issue stated in the inspection report. However, SNC assessed the safety significance of the subject AV and concluded that the finding was of very low safety significance (Green). The decreased safety significance was based upon additional plant specific factors beyond those included in the NRC's assessment that were characterized as taking into account the real-world operational response to the event. These factors are summarized below:

- Plant staff actions, which would be taken in an actual event, to shut down the 2A Emergency Diesel Generator (EDG) prior to damage, repair and recover the 2A Plant Service Water pump, and re-start the 2A EDG. The time-frame required to complete this recovery action without incurring damage to the 2A EDG is supported by a study conducted by Fairbanks Morse, the manufacturer of the EDG.
- Fire modeling conducted by SNC demonstrates that fire scenarios, which take place in the 4160VAC emergency switchgear rooms, do not cause a loss of off site power (LOSP).

- Re-calculation of the Large Early Release Frequency (LERF) with SNC's LERF model results in a value of Green.
- The exact time at which the 2A EDG LOSP timer card failed is unknown. The exact time at which the FW controller failed was known immediately, and it occurred four months after the discovery of the timer card failure. Therefore, they were never in a failed state at the same time.

SNC's request in its March 19, 2010, response that the NRC re-evaluate the safety significance of this preliminary finding considering the above information. In SNC's view this approach would take into account the real-world operational response to the event.

After considering the information developed during the inspection and the additional information provided in SNC's written response, the NRC concluded that the finding should be characterized as a White finding, i.e., a finding with low to moderate safety significance which will require additional NRC inspection. The bases for the NRC's significance determinations are discussed in Enclosure 2.

You have 30 calendar days from the date of this letter to appeal the staff's significance determination for the White finding. Such appeals will be considered to have merit only if they meet the criteria given in NRC Inspection Manual Chapter 0609, Attachment 2.

The NRC has also determined that the failure to establish and perform preventive maintenance activities to replace electrolytic capacitors prior to their failure was a violation of TS 5.4, Procedures, as cited in the enclosed Notice of Violation (Notice) (Enclosure 1). The circumstances surrounding the violation were described in NRC Inspection Report No. 05000321/2009005 and 05000366/2009005. In accordance with the NRC Enforcement Policy, the Notice is considered an escalated enforcement action because it is associated with a White finding.

For administrative purposes, this letter is issued as a separate NRC Inspection Report, No. 05000366/2010006. Apparent Violation (AV) 05000366/2009005-02 related to establishing appropriate preventive maintenance for electrolytic capacitors, is now Violation (VIO) 05000366/2010006-01, Failure to establish appropriate preventive maintenance for electrolytic capacitors. The NRC concluded that this violation had a cross-cutting aspect in the Operating Experience component of the Problem Identification and Resolution area (P.2(b)), in that SNC did not implement and institutionalize operating experience through changes to station processes, procedures, equipment, and training programs. Specifically, the licensee did not make changes to station processes when internal and external operating experience indicated similar electrolytic capacitors failures were occurring.

Because plant performance for this issue has been determined to be beyond the licensee response band of the NRC Action Matrix, we will use the Action Matrix to determine the most appropriate NRC response for this issue. We will notify you, by separate correspondence, of that determination.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such information, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). The NRC also includes significant enforcement actions on its Web site at http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/.

Sincerely,

/RA/

Luis A. Reyes
Regional Administrator

Docket No.: 50-366
License No.: NPF-5

Enclosures: 1. Notice of Violation
2. NRC Basis for Final Significance Determination

cc w/encls: (See page 4)

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such information, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). The NRC also includes significant enforcement actions on its Web site at http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/.

Sincerely,

/RA/

Luis A. Reyes
Regional Administrator

Docket Nos.: 50-366
License Nos.: NPF-5

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cc w/encls: (See page 4)

X PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE X NON-SENSITIVE

ADAMS: ☐ Yes ACCESSION NUMBER:_____________ ☐ SUNSI REVIEW COMPLETE

OFFICE	RII:DRP	RII:DRS	RII:EICS	RII:DRP	RII:ORA	OE	NRR
SIGNATURE	SMS /RA/	RHB /RA/	CFE /RA/	LDW /RA/	VMM /RA/	Via telcon	Via telecon
NAME	SShaeffer	RBernhard	CEvans	LWert	VMcCree	GGulla	GGulla
DATE	04/29/2010	04/29/2010	04/29/2010	04/29/2010	05/12/2010	05/10/2010	05/10/2010
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: G:\DRPII\RPB2\HATCH\SDPENFORCEMENT\HATCH EA-10-009 FSD.DOCX

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Letter to Dennis R. Madison from Luis A. Reyes dated May 12, 2010

SUBJECT: FINAL SIGNIFICANCE DETERMINATION OF WHITE FINDING AND NOTICE OF VIOLATION (NRC INSPECTION REPORT NO. 05000366/2010006), EDWIN I. HATCH NUCLEAR PLANT UNIT 2

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NOTICE OF VIOLATION

Southern Nuclear Operating Company, Inc.
Edwin I. Hatch Nuclear Plant
Unit 2

Docket No. 50-366
NPF-5
EA-10-009

During an inspection completed by the NRC on December 31, 2009, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

> Technical Specification 5.4.1 requires, in part, that procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978.
>
> Regulatory Guide 1.33, Appendix A, section 9.b states, in part, preventive maintenance schedules should be developed to specify replacement of parts that have a specific lifetime.
>
> Procedure NMP-ES-006, Predictive Maintenance Implementation and Continuing Equipment Reliability Improvement, is the licensee's current procedure which requires that component preventive maintenance activities be developed and scheduled to replace parts that have a specific lifetime. Specifically Section 5.4 of NMP-ES-006 requires, in part, that the licensee develop and maintain a documented maintenance strategy with recommended time-based preventive maintenance taking into account Original Equipment Manufacturer (OEM)/Vendor recommendations and other data affecting component reliability.
>
> Contrary to the above, between 1988 and 2009, the licensee failed to implement site procedures to develop preventive maintenance schedules that specify replacement of electrolytic capacitors, which are parts that have been identified as having a specific lifetime, for Unit 2 emergency diesel generator loss of coolant accident/loss of offsite power timer cards and their associated power supplies.
>
> This violation is associated with a White significance determination process finding for Unit 2 in the Mitigating Systems cornerstone.

Pursuant to the provisions of 10 CFR 2.201, Southern Nuclear Operating Company, Inc. is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; EA-10-009" and should include: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 12 day of May 2010.

NRC Bases for Final Significance Determination

The NRC's inspection report of February 12, 2010, documented the preliminary significance determination of a preliminary Greater than Green finding involving the Edwin I. Hatch Nuclear Plant preventive maintenance program. The finding was also determined to be an apparent violation (AV) and was assessed under the applicable significance determination process (SDP).

In lieu of requesting a Regulatory Conference, Southern Nuclear Operating Company, Inc., (SNC) provided a written response dated March 19, 2010. In the response, SNC stated it does not dispute the AV or the cross-cutting issue stated in the inspection report. However, SNC assessed the safety significance of the subject AV and concluded that this finding was of very low safety significance (Green). The decreased safety significance was based upon additional plant specific factors beyond those included in the NRC's assessment that the licensee characterized as taking into account the real-world operational response to the event. These assumptions differed in some instances with those used by the NRC in the preliminary significance determination. In determining the final significance, NRC considered SNC assumptions and factored them into the significance determination process when appropriate. A number of SNC's assumptions were accepted and integrated into the NRC final significance determination. There were several differences between NRC and SNC in the NRC's final significance determination. The paragraphs below provide a summary of the NRC's considerations of the additional information, the NRC's conclusions, and the bases for the NRC's final significance determination.

The licensee provided four major points in their letter dated March 19, 2010:

1. Operator action and survivability of the EDG.

   SNC Input: Plant staff actions, which would be taken in an actual event, to shut down the 2A Emergency Diesel Generator prior to damage, repair and recover the 2A Plant Service Water pump, and re-start the 2A EDG.

   NRC Response: This was not credited in the original NRC evaluation due to lack of docketed information at that time. The licensee provided information that was used to credit some degree of recovery for the 2A EDG. A letter was provided from the equipment vendor concerning the survivability of an unloaded EDG run without cooling water. With time to shut down the EDG prior to damage, it would be possible to restart the EDG later if cooling water could be established. These actions could allow the plant to avoid core damage for certain high value sequences that currently result in damage. The licensee has provided calculations to estimate the likelihood of accomplishing these actions.

   The NRC has reviewed the letter from the vendor on the survivability of the EDG provided in Enclosure (9) of the March 19, 2010, response. The letter concluded that the licensee could run the EDG for greater than the 3 minutes specified in the FSAR with the EDG unloaded. The NRC determined based on the information provided, that it was inconclusive how long the EDG could run without cooling water while unloaded without exceeding alarm setpoints. The information, from an actual test, provided by the vendor indicated that a fully loaded

EDG of similar size and specification had run for 8.8 minutes fully loaded without cooling water flow before reaching an alarm setpoint. This empirical information was substantial in increasing the confidence that an unloaded EDG could run for at least 30 minutes without exceeding alarm setpoints when starting from a warm-up condition. The NRC reviewers did not have confidence in the calculations that indicated the EDG could run for 148 minutes unloaded without receiving an alarm. The information provided did not indicate the level of uncertainty associated with the calculations.

A review was performed of calculations provided by the licensee for the Human Reliability Assessments (HRA) required to stop the EDG, discover the problem with the plant service water (PSW) pump start circuit, and restart the EDG. There were high uncertainties associated with the available time to stop the EDG before damage, as described above, and with the amount of time required by the licensee's staff to perform the diagnosis of the deficiency that would be necessary to allow EDG restart. Sensitivity calculations were performed to determine if a critical time existed for the EDG shutoff that resulted in a significant change in the HRA credit. Using the SPAR-H calculations and a timeline provided by the resident inspectors that normalized all elapsed time measurements to the start of the event, a time of 30 minutes was established as the break point for a large increase in the failure probability of the action to stop the EDG. The high uncertainty in the required time to diagnose the problem resulted from there only being a single data point from which to determine an uncertainty distribution. The confidence in the HRA probability was based only on the assumptions made with respect to this distribution. Depending on the assumptions used in the HRA, the value for the probability of the failure to recover the EDG could be much higher than the value proposed by the licensee.

The Senior Reactor Analyst (SRA) performed sensitivity calculations with various assumed values for the HRA to determine their impact on the outcome of the SDP analysis. Calculations were performed assuming recovery values as low as the licensee's submitted values, up to the higher values possible if less time was available to stop the EDG before damage. All resulted in Core Damage Probability (CDP) values that would result in a White SDP significance.

2. Loss of off site power (LOSP) and fire modeling.

<u>SNC Input</u>: Fire modeling conducted by SNC demonstrates that fire scenarios, which take place in the 4160VAC emergency switchgear rooms, do not cause a LOSP.

<u>NRC Response</u>: Updated fire frequency information from the licensee was not available prior to issuance of the original Phase 3. The analyst used the best available information from early fire reviews. While reviewing the information provided in the licensee's response of March 19, additional calls were made to obtain supporting information, and to explain the NRC's methodology to the licensee. Based on the additional information provided from the licensee, the staff determined that a LOSP can result from a fire in the switchgear rooms. Updated fire frequency values were used based on new information from the licensee. The SRA determined a new fire Conditional Core Damage Probability (CCDP) for the switchgear rooms based on new runs of the SPAR model for Hatch. These analyses have resulted in a reduction in the risk contribution due to these rooms. The licensee has also provided a fire frequency for a fire in a control room panel that could result in a LOSP that would be

impacted by the finding. These modified fire inputs were included in the calculations performed as part of the final SDP calculations.

3. Large Early Release Frequency.

SNC Input: Re-calculation of the Large Early Release Frequency (LERF) with SNC's LERF model results in a value of Green.

NRC Response: Discussions with NRC staff and contractors have indicated that conservatisms exist in the SDP's current treatment of LERF for BWR Mark 1 containments. The staff will use the licensee's submitted information to help perform future reviews of the SDP guidance for Mark 1 containments. The consensus is that the Large Early Release Probability (LERP) contribution for this finding is less than the Yellow indicated by the initial SDP calculations. Since the CDP stayed White, it will be the basis of the SDP outcome.

4. Concurrent Failures

SNC Input: The exact time at which the 2A EDG LOSP timer card failed is unknown. The exact time at which the FW controller failed was known immediately, and it occurred four months after the discovery of the timer card failure. Therefore, they were never failed at the same time.

NRC Response: As discussed in NRC Inspection Report No. 05000321/2009005 and 05000366/2009005, dated February 12, 2010, the feedwater (FW) event and the PSW card condition (2A EDG LOSP timer card) were determined to be from the same root cause. The NRC concluded that the common root cause associated with these two issues involved failed aged electrolytic capacitors that were not replaced after their effective service life. These issues were characterized as a single performance deficiency. NRC Manual Chapter 308, Attachment 3, Significance Determination Process Basis Document, Section 6.0, Treatment of Concurrent Degraded Conditions, defines how the NRC assesses cases where the approximate cause of multiple degraded conditions is the same. The Manual Chapter states, in part, that in this circumstance, there is likely to be only one finding (based on the identified performance deficiency related to the proximate cause) and the risk impact of the collective degraded conditions is appropriately used as the basis for the SDP result. Further, although the condition and the event, as analyzed within the SDP, were separated in time, the vulnerability of concurrent degraded conditions existed.

In accordance with NRC process, the risk results were assessed by combining the separate risk of the feedwater event and the PSW card condition. The feedwater event model was not modified to include the PSW card's performance deficiency when the calculation was performed.

In addition, upon reviewing the licensee's calculation for the feedwater trip event, the methodology employed was the same as the NRC would use to calculate the probability of core damage from an event that occurred on a particular day of the year. The appropriate method for calculating the increase in risk to the public for an event that actually occurred is to use the conditional core damage probability. Therefore, the NRC used the value from the original SDP for the impact of the feedwater event in the final SDP determination.

<u>Conclusion</u>: After considering the information provided by SNC in their response letter dated March 19, 2010, the NRC determined that the risk significance of this finding was in the low to mid E-6 range and was still greater than the Green/ White threshold of 1E-6 and should be characterized as White, a finding of low to moderate safety significance.