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SOUTHERN COMPANY

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Edwin I. Hatch Nuclear Plant Units 1 and 2
Response to License Amendment Request Unacceptable with Opportunity to Supplement

Ladies and Gentlemen:

By letter dated August 11, 2015, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML115226A276), Southern Nuclear Operating Company (SNC) submitted a license amendment request (LAR) to revise Technical Specifications (TS) to adopt TSTF-500, Direct Current (DC) Electrical Rewrite, for the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2. The LAR proposes to revise TS requirements related to DC electrical systems in TS limiting condition for operation (LCO) 3.8.4, "DC Sources – Operating," LCO 3.8.5, "DC Sources – Shutdown," and LCO 3.8.6, "Battery Cell Parameters." A new Battery Monitoring and Maintenance Program is being proposed for Section 5.5 "Administrative Controls – Programs and Manuals." By letter dated February 3, 2016, the Nuclear Regulatory Commission (NRC) provided the results of their acceptance review of SNC's request to amend the HNP TS. The NRC concluded that to make an assessment as to the acceptability of the LAR, more information was needed regarding the engineering evaluation performed as part of the request to increase the Completion Time (CT) on the station service batteries from 2 to 12 hours. Consequently, the NRC requested that SNC supplement the application to address the information requested in the Enclosure to their February 3, 2016 letter.

Also in the Enclosure, the NRC noted that the information regarding the risk assessment concerning the CT increase was sufficient to begin its review, and, that the NRC was requesting additional information to complete its review.

This letter provides the responses to questions 1 through 5 which deal with the engineering evaluation. The responses to questions 6 through 10, on the risk assessment, will be provided by March 31, 2016.

This letter contains no NRC commitments. If you have any questions, please contact Ken McElroy at (205) 992-7369.

Mr. C.R. Pierce states he is Regulatory Affairs Director of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and, to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

C. R Pierce

C. R. Pierce
Regulatory Affairs Director

CRP/OCV/

Sworn to and subscribed before me this 16th *day of* March, *2016.*

Notary Public

My commission expires: 1-2-2018

Enclosure: Response to Questions 1 through 5

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
Mr. D. R. Vineyard, Vice President – Hatch
Mr. M. D. Meier, Vice President – Regulatory Affairs
Mr. D. R. Madison, Vice President – Fleet Operations
Mr. B. J. Adams, Vice President – Engineering
Mr. G. L. Johnson, Regulatory Affairs Manager - Hatch
RType: CHA02.004

U. S. Nuclear Regulatory Commission
Ms. C. Haney, Regional Administrator
Mr. M. D. Orenak, NRR Project Manager – Hatch
Mr. D. H. Hardage, Senior Resident Inspector – Hatch

State of Georgia
Mr. J. H. Turner, Director - Environmental Protection Division

Edwin I. Hatch Nuclear Plant Units 1 and 2
Response to License Amendment Request Unacceptable with Opportunity to Supplement

Enclosure

Response to Questions 1 through 5

NRC Questions

By letter dated August 11, 2015, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML115226A276), Southern Nuclear Operating Company (SNC) submitted a license amendment request (LAR) to revise Technical Specifications (TS) to adopt TSTF-500, Direct Current (DC) Electrical Rewrite, for the Edwin I. Hatch Nuclear Plant (HNP), Units 1 and 2. The LAR proposes to revise TS requirements related to DC electrical systems in TS limiting condition for operation (LCO) 3.8.4, "DC Sources – Operating," LCO 3.8.5, "DC Sources – Shutdown," and LCO 3.8.6, "Battery Cell Parameters." A new Battery Monitoring and Maintenance Program is being proposed for Section 5.5 "Administrative Controls – Programs and Manuals."

The U.S. Nuclear Regulatory Commission (NRC) staff has determined that the following additional information regarding the engineering evaluation is necessary to enable the NRC staff to make an independent assessment regarding the acceptability of the LAR in terms of regulatory requirements and the protection of the public health and safety and the environment.

Section 2.4 of the LAR, OPTIONAL CHANGES AND VARIATIONS," stated that "SNC is proposing a completion time (CT) longer than 2 hours for proposed Specification 3.8.4, Required Action E.1. A risk evaluation supporting the longer CT is included as Enclosure 2 of the LAR." SNC stated that their Enclosure 2 evaluation is in accordance with the guidance provided in Regulatory Guide (RG) 1.177, "An Approach for Using Probabilisitic Risk Assessment in Risk Informed Decisions on Plant Specific Changes to the Licensing Basis, Revision 2." It was not apparent to the NRC staff where SNC provided the applicable engineering evaluation to support the CT extension of batteries from 2 hours to 12 hours. SNC states that defense-in-depth is primarily provided by the fact that the other division is operable. To complete the staff's acceptance review, the staff requests a detailed engineering evaluation to assess whether the impact of the proposed TS change is consistent with the selected principles identified in RG 1.177 and RG 1.174, as noted below, with respect to whether:

1. The proposed change meets the current regulations (unless it is explicitly related to a specific exemption pursuant to 10 CFR 50.12, "Specific Exemptions").

SNC Response

The proposed change to increase the Completion Time (CT) on the station service batteries from 2 to 12 hours meets all current applicable regulations.

10 CFR 50.36 provides the Code of Federal Regulations (CFR) for the Technical Specifications (TS). The CFR requires that TS contain sections for Safety Limits, Limiting Safety System Settings, and Limiting Conditions for Operation (LCOs), among others. Furthermore, according to the CFR, "... when a limiting condition for operation is not met, the licensee shall shutdown the reactor or follow any remedial action permitted by the technical specifications until the condition can be

met". Section 1.3 of the TS states "Limiting Conditions for Operation (LCOs) specify minimum requirements for ensuring safe operation of the unit. The ACTIONS associated with an LCO state Conditions that typically describe the ways in which the requirements of the LCO can fail to be met. Specified with each stated Condition are Required Action(s) and Completion Time(s). The Completion Time (CT) is the amount of time allowed for completing a Required Action." The CTs are part of the remedial actions noted in 10 CFR 50.36, but they are not explicitly listed in the regulation. In other words, the regulation does not specify the CT for individual TS components. Consequently, changing a CT does not cause a non-compliance with 10 CFR 50.36.

This risk informed change only proposes a change to the CT of the station service batteries. There are no physical modifications being made to the batteries or to any of their support equipment, nor are there changes being proposed to their operation, in either accident or normal conditions. This risk-informed revision to the CT proposes no changes to the maintenance, surveillance, or testing of the station service DC system. Consequently, the capability of the station service DC system, with respect to its safety function in the prevention and mitigation of core damage and containment failure, as required by General Design Criteria (GDC) 17, "Electric Power Systems", is not reduced. Additionally, the capabilities for inspection and testing of the DC systems, as required by GDC 18, "Inspection and Testing of Electric Power Systems", are not affected by the proposed change to the CT.

As discussed in the original HNP TSTF-500 submittal, HNP-2 is committed to the GDC. However, HNP-1 was not licensed under the 10 CFR 50, Appendix A GDC. The HNP Construction Permit was received under the 70 General Design Criteria as discussed in Section F.3 of the UFSAR. The Unit 1 Design Basis was reviewed against the Appendix A GDC. Those evaluations have been preserved in the HNP UFSAR, Appendix F, for historical purposes. The specific CT for the station service batteries is not the subject of any of those Criteria, therefore, increasing the CT of the station service batteries, as proposed in this TS change, will not affect those evaluations.

TSTF-500, Rev. 2 also lists 10 CFR 50.63, "Loss of all alternating current power", and 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants", as being applicable. Neither of these CFR requirements will be negatively affected by the increase in the station service battery CT.

The increase in the CT will not affect HNP's response to a Station Blackout (SBO) as described in Section 8.4 of the Unit 2 FSAR. (This particular section of the FSAR is applicable to both units). This is because neither the design nor the operation of the systems credited for the mitigation of SBO are affected by the increase in the battery's CT. Furthermore, none of the SBO response procedures are affected by the increase to the CT.

This risk-informed change does not affect Maintenance Rule requirements or activities. All Maintenance Rule systems, including the station service batteries, will continue to be monitored and managed according to the requirements of 10 CFR 50.65.

Accordingly, for the reasons provided above, the risk-informed change to the CT for the station service batteries meets the current applicable regulations.

NRC Questions (Cont.)

2. The proposed change is consistent with a defense-in-depth philosophy.

SNC Response

The proposed change to increase the Completion Time (CT) on the station service batteries from 2 to 12 hours does not affect the designed defense-in-depth capabilities of the HNP onsite electrical DC system.

There are no physical modifications proposed to the DC systems as a result of this TS change. Consequently, the elements of defense-in-depth dealing with independence of redundant systems and the performance of the redundant DC subsystem in support of other systems designed to prevent and mitigate core damage and containment failure, is unaffected by the change in CT.

There are no changes proposed to the normal or emergency operation of the DC system as a result of the proposed change to the CT. Additionally, the automatic operation of the DC system during accident conditions will not be affected by this change. Consequently, the plant's design basis with respect to the station service DC system accident response is unaffected.

The fact that no physical or operational changes are being made to the DC system means that no new modes of failure, including common cause failures, will be introduced.

Furthermore, since the normal and emergency operation of the DC system remains unaffected, there are no additional manual actions necessary (and proposed) which may introduce the possibility of human error to the accident response. Neither does this proposed change introduce any reliances on compensatory actions to ensure the function of the DC system.

This proposed change to the CT does not involve any of the safety related AC electrical sources, consequently, their response to design basis events is unaffected.

When one DC battery is out of service, the other DC subsystem is sufficient to support the systems needed to shut the plant down and mitigate the consequences of the accident. This is explicitly stated in the Hatch TS Bases: *"If one of the required DC electrical power subsystems is inoperable ... the remaining DC electrical power subsystems have the capacity to support a safe shutdown and to mitigate an accident condition"*. Therefore, for the case of one station service DC subsystem being inoperable, should a design basis LOCA event occur during the proposed 12 hour CT, the plant systems supported by the remaining DC subsystem would function to mitigate the consequences of the accident, shutting down the plant and protecting public health and safety. This is no different than the current 2 hour CT on the batteries, in that should a design

basis event occur with one battery inoperable, the remaining DC subsystem would be capable of safely shutting down the plant.

Should the redundant DC subsystem become inoperable before the 12 hour CT expires, the TS would require an immediate shutdown. This would be accomplished through Condition H of the proposed Technical Specifications, which would be entered upon realization that both DC systems were inoperable. Per the HNP Technical Specifications, operating in Modes 1, 2, or 3 is not permitted with both DC subsystems out of service.

NRC Questions (Cont.)

3. The proposed change maintains sufficient safety margins.

SNC Response

The proposed change to increase the CT on the station service batteries will not affect the current design bases for the batteries. This is because no design modifications are being proposed to the DC system and because no changes to the normal or emergency operation of the station service DC system is being proposed by this risk-informed change to the battery CT. Furthermore, this change is not affecting the surveillance or maintenance practices on the station service DC system. It is true that some surveillance requirements are being eliminated from the TS as a result of TSTF-500, but those are not being removed as a result of the risk-informed change to the CT, which is the subject of this evaluation. Nevertheless, those surveillances will still be performed, but under licensee maintained controls. Consequently, the DC system's expected response to a design basis event will remain the same; thus the margin to criteria, such as the 10 CFR 50.46 ECCS acceptance criteria, is not affected.

Likewise the existing level of adherence to codes and standards are not affected. For example, this proposed change to the CT does not affect the level of adherence to the IEEE Standards listed in Chapter 8 of the Unit 2 FSAR. These Standards deal with, among other things, the standard criteria for Class 1E electrical systems (IEEE 308-1971), the seismic qualification of electrical equipment (IEEE-344), and the recommended practices for maintenance, testing and replacement of large lead-acid batteries (IEEE 450-1987). Again, these standards are not affected because this risk-informed change to the battery CT does not propose any physical modifications to the HNP Station Service DC system. Nor does it propose any changes to the qualifications of the DC system, or to its operation or maintenance.

Also, adherence to Reg Guides 1.75 and 1.129, as described in Section 3.2 of the original submittal is not affected by this proposed increase to the station service DC batteries' CT. (Reg Guide 1.75 addresses the criteria for independence of electrical safety systems and Reg Guide 1.129 addresses maintenance and testing of lead-acid batteries for nuclear plants). With respect to Reg Guide 1.75, it is not affected by this revision to the CT because no physical changes are being made to the DC system which would affect the physical independence of the two DC subsystems. Reg Guide 1.129 is mentioned explicitly in TSTF-500 as part of the Battery Maintenance and

Monitoring Program. And, in accordance with TSTF-500, this Reg Guide is listed in Section 5.5.15, "Battery Maintenance and Monitoring Program", of the HNP TS mark-up as the primary standard for the program. Consequently, the Battery Maintenance and Monitoring Program will be performed in accordance with Reg Guide 1.129, as required by TSTF-500. Increasing the CT on the station service battery, which is explicitly allowed by TSTF-500, will therefore not affect the adherence to Reg Guide 1.129.

When a station service battery is inoperable, and provided no additional failures occur, the redundant DC subsystem is capable of providing support to those systems needed to mitigate the effects of design basis events, and to shutdown the plant and maintain it in a safe shutdown condition including the maintenance of margin to FSAR safety criteria. This is stated in the current Hatch TS Bases under the discussion for Condition C.1.

NRC Questions (Cont.)

The NRC staff has additional requests regarding the engineering evaluation.

4. Please provide an analysis to show the DC system can still provide the safety function for a:

    a. Loss of offsite power/loss of coolant accident (LOOP/LOCA) when the plant is in a TS LCO for one battery inoperable train and the other battery train is found to be inoperable.

SNC Response

If the plant is in the LCO Condition for one station service battery inoperable, and the redundant battery train is subsequently found inoperable, the plant must be immediately shutdown. This is because the loss of the second DC subsystem represents a TS Loss of Function. According to the TS Bases for current Condition E for HNP LCO 3.8.4: "Condition E corresponds to a level of degradation in the DC electrical power subsystems that causes a required safety function to be lost". Condition H is the similar Condition in the proposed TS; it will also require an immediate plant shutdown, via entry into LCO 3.0.3.

It should also be noted that, when Condition E of the current TS, or Condition H of the proposed TS is entered, single failure criteria is temporarily relaxed. Thus, an additional failure is not postulated. This is acceptable because the resulting REQUIRED ACTION statement and CT provide a limited time to repair the inoperable component. Single failure criteria while operating in an LCO Condition is discussed in Generic Letter 80-30.

Summarizing, with two Station Service batteries out of service, the DC system may not be able to provide the safety function with respect to LOOP/LOCA; the plant is therefore immediately shutdown.

NRC Questions (Cont.)

4. Please provide an analysis to show the DC system can still provide the safety function for a:

   b. LOOP/LOCA with only the battery charger available. Please explain if the battery charger is auto sequenced during a LOOP and LOOP/LOCA. Also, please explain the plant systems' response if no DC power is available in the time between LOOP or LOOP/LOCA and when the battery chargers are connected to the emergency diesel generator.

SNC Response

With only the battery chargers available, the TS will require an immediate shutdown of the plant. This is per Condition E of the current TS and per Condition H of the proposed TSTF-500 revision. For a station service DC subsystem to be considered Operable, the 125/250 VDC battery must be Operable and two of the three supporting battery chargers must be Operable. Therefore, if only the battery chargers are available, i.e., if both Division I and Division II batteries are inoperable, that represents a TS Loss of Function condition and the plant must be immediately shutdown per LCO 3.0.3. With only the battery chargers available, there is no assurance that the plant can adequately respond to a design basis event.

With regard to the operation of the battery chargers post LOOP, or post LOOP/LOCA, they are not automatically sequenced on. In an accident, the station service battery chargers are "load shed" from their normal power supply, (the respective Division I and Division II 600 V emergency buses). Later in the design basis accident, the emergency diesel generators restore AC power to the 4 kV and 600 V emergency buses. If the operators then desire to place the battery chargers in service, manual actions must be performed.

Summarizing, with no Operable batteries and just the battery chargers available, an immediate shutdown is required per LCO 3.0.3.

NRC Questions (Cont.)

5. Please provide justification for the 12 hour CT duration of the batteries. Specifically, provide (1) the actual hours needed and (2) a detailed schedule of the activities performed to restore battery operability based on HNP-specific operating experiences.

SNC Response

The request for the 12 hour CT is not based on any desired change to the battery maintenance procedures and strategy. Two hours is a very short CT and, therefore, SNC is requesting 12 hours to take advantage of the TSTF-500 allowance for such an increase. The increase to a CT of 12 hours from the current 2 hours is desired solely to provide more time in returning the battery to service should an emergent condition arise during power operation, resulting in one of the station service batteries being declared inoperable.

For example, it is sometimes necessary to replace a damaged or otherwise inoperable cell. If such a replacement is necessary, it can be challenging with respect to the 2 hour CT. First, the cell must be jumpered out. To do this, the documentation package must be prepared and parts have to be obtained before the jumpers are actually installed in the field. Included in the preparation is a verification that the evaluation for jumpering a cell, or cells, is current and valid. This must all occur within 2 hours since the battery is declared inoperable as soon as the cell is discovered degraded. Once the jumpers are installed, the LCO Condition would be exited and the battery declared Operable.

Plans would then begin for the cell replacement, which would actually occur at a later date. The preparations involve getting the parts and package together, testing a spare cell, and setting up scaffolding equipment for the replacement. Following that, the LCO Condition is entered when the cell replacement begins. The cell replacement itself includes loosening the rack bolts, removing cell spacers and replacing the flame arrestor with a shipping cap. The cell is removed using a lifting device and lifting straps. The cell is very heavy, consequently, care must be taken to prevent personnel injury and damage to the cell itself. The old cell is placed to the side and the replacement cell is then similarly lifted and put into place. Following the installation of the replacement cell, the cell spacer and flame arrestor must be re-installed and the rack bolts torqued per specifications listed in procedure. Following those actions, the system must be returned to service. The return-to-service steps include disconnecting jumpers, cleaning the exposed surfaces of posts and connectors if necessary, installation of the cell connectors, and the adjustment of charger voltage.

It can be challenging to complete both the cell jumpering and the cell replacement within a 2 hour window. As a result, sometimes the cell replacement is left until an outage, depending on the timing.

The challenges presented by these types of emergent conditions would be assuaged somewhat with a 12 hour CT.

Summarizing, the increase to the current CT for the station service batteries is intended to aid in emergent situations; it is not intended to change the preventative maintenance practices on the station service batteries. Consequently, there is no "actual hours" needed.