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SOUTHERN COMPANY
Energy to Serve Your World℠

February 2, 2009

NL-09-0124

Docket Nos.: 50-424
50-425

Mr. Scott Shaeffer
U. S. NRC Region II
Sam Nunn Atlanta Federal Center, 23 T85
61 Forsyth Street, SW
Atlanta, GA 30303-8931

Vogtle Electric Generating Plant – Units 1 and 2
Additional Information Regarding NRC Supplemental Inspection Report
05000424/2008009 and 05000425/2008009

Dear Mr. ~~Shaeffer~~ Scott:

On December 11, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection in accordance with Inspection Procedure 95001. The inspection results were transmitted to Southern Nuclear Company (SNC) on January 9, 2009. As documented in the referenced inspection results, the inspector opened unresolved item (URI) 05000424/2008009-01, Technical Specification Operability of the NSCW System with the Cooling Tower Return Valves in Manual Control. In order to clarify the licensing basis for the NSCW, SNC has made changes to section 9.2.1.2.3 of VEGP Updated Final Safety Analysis Report (UFSAR) in accordance with the requirements of 10 CFR 50.59 and changes to Technical Specification Bases 3.7.9 in accordance with the requirements of the Technical Specification (TS) Bases Control Program as documented in Licensing Document Change Request (LDCR) 2008039. In addition, SNC developed a position paper regarding the operability of the NSCW system with the cooling tower return valves in manual control. LDCR 2008039 and NSCW Spray Valve Operability Position Paper are provided for your information as Enclosures 1 and 2, respectively.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

Mark J Ajluni

M. J. Ajluni
Manager, Nuclear Licensing

MJA/TAH/daj

Enclosures: 1. LDCR # 2008039
2. NSCW Spray Valve Operability Position Paper

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. T. E. Tynan, Vice President – Vogtle
Mr. D. H. Jones, Vice President – Engineering
RType: CVC7000

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Vogtle
Mr. E. D. Morris, Acting Senior Resident Inspector – Vogtle
Document Control Desk

Vogtle Electric Generating Plant – Units 1 and 2
Additional Information Regarding NRC Supplemental Inspection Report
05000424/2008009 and 05000425/2008009

Enclosure 1

LDCR # 2008039

Southern Nuclear Operating Company			
SOUTHERN COMPANY	Nuclear Management Procedure	Licensing Document Change Request	Page 1 of 2

Plant: Farley ☐ Hatch ☐ Vogtle ☒	**Unit No.** 1 ☐ 2 ☐ Shared ☒
Activity/Document No.: N/A (Act./Doc. Initiating the Change)	**LDCR No.:** 2008039 **Version No.:** 1.0
Activity/Document Version No.: N/A	
Title: NSCW Tower Return Valve Operation	

Preparer: Mark Hickox (Print) / [signature] (Signature) Date: 8/15/08

Reviewer: Tracy Honeycutt (Print) / [signature] (Signature) Date: 8/18/08

LDO: Tracy Honeycutt (Print) / [signature] (Signature) Date: 8/18/08

Reviewer (As Needed): N/A (Print) / N/A (Signature) Date: N/A

Site Reviewer: MARK HICKOX (Print) / [signature] (Signature) Date: 8/15/08

Impacted Licensing Documents: VEGP FSAR, Revision 15-updated 7/31/08, section 9.2.1 and VEGP Technical Specification Bases (July 14, 2008) section 3.7.9.

Change: Added a paragraph describing the acceptability of manual operation of the NSCW Tower Return valves when administratively controlled to FSAR paragraph 9.2.1.2.3 and Technical Specification Bases 3.7.9.

Justification: FSAR Table 9.2.1-2, Failure Modes and Effects Analysis describes manual operator action to position the tower return valves as a credited safety function. Since, manual operator action to position these valves is credited in the FSAR and analysis has shown that there is sufficient time available for the operator to recognize and position the valves to the desired alignment under administrative control, clarifying paragraphs outlining this capability were added to FSAR section 9.2.1 and TS Bases 3.7.9.

Yes ☒ No ☐ PRB Review Required
(An LDCR that is limited in scope to that described Question 8 (FSAR only) of the Applicability Determination Checklist does not require PRB review)

If No: N/A (Print) / N/A (Licensing Mgr. Signature) Date: N/A

If Yes: 2008-44 (PRB Meeting No.) Date: 8/15/08

VP-Plant Approval: TOM TYNAN (Print) / [signature] (Signature) Date: 8/20/2008

Yes ☐ No ☒ Implementation Pending-See Comments (e.g. NRC prior approval required, DCP/MDC/RER completion required)

Comments: N/A

Southern Nuclear Operating Company			
SOUTHERN COMPANY	Nuclear Management Procedure	Applicability Determination	Page 1 of 4

Plant: Farley ☐ Hatch ☐ Vogtle ☒	Unit No. 1 ☐ 2 ☐ Shared ☒
Activity/Document No.: N/A (Act./Doc. initiating the Change)	AD Version No.: 1.0
Activity/Document Version No.: N/A	
Title: NSCW Tower Return Valve Operation	

Section I – Activity Summary

Preparer: Mark Hickox (Print) _____ (Signature) Date: 8/15/08

Reviewer: Tracy Honeycutt (Print) _____ (Signature) Date: 8/18/08

Description of Change: Added a paragraph describing the acceptability of manual operation of the NSCW return valves when administratively controlled to FSAR paragraph 9.2.1.2.3 and Technical Specification Bases 3.7.9.

FSAR Table 9.2.1-2, Failure Modes and Effects Analysis describes manual operator action to position the tower return valves as a credited safety function. Since, manual operator action to position these valves is credited in the FSAR and analysis has shown that there is sufficient time available for the operator to recognize and position the valves to the desired alignment under administrative control, clarifying paragraphs outlining this capability were added to FSAR section 9.2.1 and TS Bases 3.7.9.

Section II – Applicable Regulation Determination

1. ☐ Yes ☒ No **Does the activity involve a change to the (identify which):**
   - a. ☐ **Operating License/Renewed Operating License,**
   - b. ☐ **Technical Specifications**
   - c. ☐ **Environmental Protection Plan?**
   - d. ☐ **Dry Storage Certificate of Compliance?**

   If the answer to question (1.a), (1.b), or (1.c) is yes, refer this activity to SNC Nuclear Licensing for preparation/review of a 10 CFR 50.92 evaluation. If the answer to question (1.d) is yes, refer this activity to SNC Nuclear Licensing to request the dry storage certificate holder to revise their Certificate of Compliance.

2. ☐ Yes ☒ No **Using the guidance provided in Attachment 1 to NMP-AD-008, does the activity involve an impact or change to the Quality Assurance Topical Report (either direct or indirect)?**

   If the answer to question (2) is yes, refer this activity to SNC Quality Assurance for preparation/review of a 10 CFR 50.54(a) evaluation.

3. ☐ Yes ☒ No **Using the guidance provided in Attachment 2 to NMP-AD-008, does the activity involve an impact or change to the Security Plan, Contingency Plan, or the Security Training and Qualification Plan (either direct or indirect)?**

   If the answer to question (3) is yes, refer this activity to SNC Security for preparation/review of a 10 CFR 50.54(p) evaluation.

4. ☐ Yes ☒ No **Using the guidance provided in Attachment 3 to NMP-AD-008, does the activity involve an impact or change to the Emergency Plan (either direct or indirect)?**

   If the answer to question (4) is yes, refer this activity to SNC Emergency Planning for preparation/review of a 10 CFR 50.54(q) evaluation.

5. ☐ Yes ☒ No **Does the activity involve a change to the Inservice Inspection Program or to the Inservice Testing Program, including relief requests?**

   If the answer to question (5) is yes, refer this activity to SNC Materials and Inspection Services for preparation/review of a 10 CFR 50.55a evaluation.

6. ☐ Yes ☒ No **Using the guidance provided in Attachment 4 to NMP-AD-008, does the activity involve a change to the Fire Protection Program and/or Implementing Procedures?**

   If the answer to question (6) is yes, refer the activity to SNC Fire Protection for preparation/review of a fire protection evaluation in accordance with the applicable Operating License condition.

7. ☐ Yes ☒ No **Using the guidance provided in Attachment 5 to NMP-AD-008, does the activity involve a managerial or administrative procedure change?**

   If the answer to question (7) is yes, the change is subject to the controls of 10 CFR 50, Appendix B. Process the change in accordance with applicable procedures.

8. ☐ Yes ☒ No **Using the guidance provided in Attachment 6 to NMP-AD-008, does the activity involve a change to the Updated FSARs/TSAR or 10 CFR 72.212 Report (including documents incorporated by reference) that is excluded from the requirements to perform a 10 CFR 50.59 or 10 CFR 72.48 review in accordance with NEI 96-07, Revision 1 or NEI 98-03, Revision 1 such as (identify which):**

   Note: The scope of this question is limited to the Updated FSARs/TSAR and 10 CFR 72.212 Report. It does not apply to other licensing documents.

   - ☐ **Editorial Changes,**
   - ☐ **Clarifications to improve reader understanding,**
   - ☐ **Correction of inconsistencies within the Updated FSARs/TSAR or 10 CFR 72.212 Report which are clearly discernible (e.g., between sections),**
   - ☐ **Designation of information as historical,**

☐ **Minor corrections to drawings (e.g., correcting mislabeled valves), or**

☐ **Similar changes that do not change the meaning or substance of information presented (e.g., reformatting or removing detail).**

☐ **Incorporation of information submitted to and approved by the NRC.**

If the answer to question (8) is yes, a 10CFR 50.59 screen is not required for this aspect of the activity. If no Updated FSARs/TSAR or 10 CFR 72.212 Report change is involved, this question is not applicable.

9. ☐ Yes ☒ No **Using the guidance provided in Attachment 7 to NMP-AD-008, does the activity involve (identify which):**

☐ **A temporary plant alteration to support maintenance (e.g., jumpering terminals, lifting leads, lead shielding, HVAC, scaffolding, and blocking doors) which:**

- **will be restored to the as-designed condition prior to startup if shutdown, or**
- **will be restored to the as-designed condition within 90 days if at power (Modes 1 and 2)?**

☐ **A temporary plant alteration that supports the installation and post-modification testing of an approved plant change which:**

- **will be restored to the as-designed condition prior to startup if shutdown, or**
- **will be restored to the as-designed condition within 90 days if at power (Modes 1 and 2)?**

If the answer to question (9) is yes, refer the activity to appropriate personnel for preparation/review of an assessment of the risk associated with this temporary plant alteration and manage in accordance with 10 CFR 50.65(a)(4).

10. ☐ Yes ☒ No **Does the activity involve a change to a regulatory commitment not covered by another regulation based change process?**

If the answer to question (10) is yes, perform an evaluation consistent with NEI 99-04.

11. ☐ Yes ☒ No **Does the activity involve a change, test, or experiment associated with the Independent Spent Fuel Storage Installation (ISFSI) or spent fuel cask design?**

If the answer to question (11) is yes, perform a 10 CFR 72.48 screen based on the following:

Has the proposed activity been evaluated by the Certificate of Compliance (CoC) holder?

☐ **Yes** **Evaluate the proposed activity against the ISFSI as described in the 10 CFR 72.212 Report.**

☐ **No** **Evaluate the proposed activity against the ISFSI as described in the applicable dry storage FSAR/TSAR and the 10 CFR 72.212 Report.**

12. ☒ Yes ☐ No **Using the guidance provided in Attachment 8 to NMP-AD-008, does the activity involve a change addressed by other plant specific programs which are different from those already identified above and are excluded from the scope of 10 CFR 50.59 and 10 CFR 72.48, and are controlled by (identify which):**

☐ **Another regulation (e.g., 10 CFRs 20, 26, 50.12, 50.46, and 72.7),**

(If marked identify):_____

☐ **Operating License/Renewed Operating License condition (e.g., maximum power level), or**

☒ **Technical Specifications or Environmental Protection Plan (e.g., the ODCM, Technical Specifications Bases Control Program, COLR, etc.)?**

If the answer to question (12) is yes, perform the activity in accordance with the applicable requirement.

13. **Using the guidance provided in Attachment 9 to NMP-AD-008, does the activity involve a matter which could result in adverse environmental impact (either direct or indirect)? Check (a) or (b)**

a. ☒ **No The nature of this change is such that it will not produce conditions which could result in significant adverse environmental impact.**

b. ☐ **Possibly** (Explain briefly):_____

If question (13.b) is checked, refer this activity to SNC Environmental Affairs for preparation/review of an Environmental Evaluation.

14. ☒ Yes ☐ No **Are there any aspects of the activity not controlled by the processes described in items 1 – 13 above?**

If the answer to question (14) is yes, perform a 10 CFR 50.59 screen. Question (14) must be answered yes if items 1 – 13 are all answered no. Question (14) must also be answered yes for all Design Change Packages (DCPs), Minor Design Changes (MDCs), and Temporary Modifications (TMs) outside the scope of question (9).

Section III – NRC Approval / LDCR Determination

15. ☐ Yes ☒ No **Is NRC approval required prior to implementation of this activity?**

If the answer to question (15) is yes, forward the activity to SNC Nuclear Licensing for preparation/review of a submittal to NRC.

16. ☒ Yes ☐ No **Does this activity require a change to a licensing document(s)?**

If the answer to question (16) is yes, process the change in accordance with NMP-AD-009.

LDCR Number (if applicable): LDCR 2008039

Southern Nuclear Operating Company			
SOUTHERN COMPANY	Nuclear Management Procedure	10 CFR 50.59 Screening/Evaluation	Page 1 of 7

Plant: Farley ☐ Hatch ☐ Vogtle ☒	Unit No. 1 ☐ 2 ☐ Shared ☒
Activity/Document No.: LDCR 2008039 (Act./Doc. Initiating the Change)	10 CFR 50.59 Version No.: 1.0
Activity/Document Version No.: 1.0	
Title: NSCW Tower Return Valve Operation	

A. Activity Summary

Preparer: Mark Hickox (Print) / (Signature) Date: 8/15/08

Reviewer: Tracy Honeycutt (Print) / (Signature) Date: 8/18/08

Nuclear Hazards Reviewer: (If required) J.A. Wehrenberg (Print) / (Signature) Date: 8-18-08

Nuclear Regulatory Reviewer: (If required) Tracy Honeycutt (Print) / (Signature) Date: 8/18/08

Reviewer/Approver: (As Needed) N/A (Print) / N/A (Signature) Date: N/A

PRB Approval or Meeting No.: 2008-44 (Print / Signature or PRB Meeting No.) Date: 8/15/08

PRB Meeting No. (If applicable and not identified above):

Description: The proposed change is a Licensee Document Change Request (LDCR) to clarify the operation of the NSCW tower return valves (HV-1668A/B and HV-1669A/B) as described in FSAR section 9.2.1 and Technical Specification Bases 3.7.9. The NSCW tower return valves provide a flowpath to direct NSCW return water to the spray header where sensible heat is transferred to the outside environment through forced draft evaporative cooling or directly to the basin to prevent icing when outside air temperatures are low. When no NSCW pumps are in Operation, the tower return valves are closed to keep the return header full of water to prevent/minimize the affects of water hammer. When a NSCW pump is in operation and the tower return valve handswitch is in "Auto", the positioning of the NSCW tower return valves is controlled based upon NSCW return header temperature. When the return header temperature is low (<75 degrees) the bypass valve (HV1668B/HV1669B) is open and the spray valve (HV1668A/HV1669A) is closed. When the return header temperature is high (>75 degrees) the spray valve (HV1668A/HV1669A) is open and the bypass valve (HV1668B/HV1669B) is closed. The tower return valves can also be positioned manually using the control room handswitch. The handswitch (HS-1668A/HS-1669A) has three positions which are maintained and controls operation of both tower return valves. The handswitch can be placed in "Auto" and the tower return valve response would be as described above. The handswitch can also be selected to the "Open Normal" position. In this position, the return water would be directed (spray valve open and bypass valve closed) to the spray header and would remain in this position irrespective of return water temperature. Similarly, if the

handswitch is selected to the "Open Bypass" position (bypass valve open and spray valve closed), the return water would be routed directly to the basin. The valves would remain in this position irrespective of return water temperature. Should a loss of offsite power occur with the handswitch in "Open Normal" or "Open Bypass", the tower return valves would close when their respective bus is loaded back onto the Emergency Diesel Generator (EDG). Once any of the NSCW pumps are sequenced back on, either the spray or bypass valve would open to some mid-position, dependent upon the selected position of the handswitch. The valve initially only opens to a mid-position as part of the slow fill design which minimizes the affects of water hammer. After a requisite time delay, a time delay relay times out, and ultimately closes a contact in the opening circuit for either the spray or bypass valve, which drives the valve to the fully open position. If the handswitch had been selected to the "Open Bypass" position, either during normal operation or during accident conditions, manual operator action would be required to place the valve either in "Auto" or "Open Normal" to ensure the return water was directed to the spray header, to allow for heat removal. Analysis has shown that with administrative controls in place, there is sufficient time available for the operator to place the tower return valves in the configuration required to perform their safety function. System Operating procedure 13150-1/2, section 4.4.15 establishes administrative controls for operating the tower return valves in manual. These controls include placing a Caution Tag on the control room handswitch (HS1668A/HS1669A) and monitoring NSCW return temperature. If NSCW return temperature reaches 85 degrees and continues to trend upward, the procedure instructs the operator to place the NSCW tower return valves in Automatic. Additionally, Emergency Operating Procedure (EOP) 19000-C, in the Reactor Operator (RO) Initial Actions step 5.b, has the operator verify that the NSCW tower return valve handswitches are in Automatic control. The term "verify," as used in Operations department procedures, means to observe the equipment to ensure it is in the position required by the procedure step. If it is not in the position required by the procedure step, the implied meaning is to put it in the position required by the procedure step. For the cases when maintenance is performed on the temperature loops (T-1668/1669), which could render the Automatic control of the tower return valves non functional (valves may not reposition based upon NSCW return water temperature), the Caution tag on the control room handswitch would alert the operator to the off normal condition, and based upon the operator's knowledge and training, would trigger the operator to place the handswitch in the configuration required.
The proposed change clarifies FSAR section 9.2.1 and TS Bases 3.7.9 on the acceptability of manually positioning the NSCW tower return valves under administrative control.

References:
1. VEGP FSAR, (Revision 15-7/31/08), Section(9.2.1, 9.2.5 and 15.0)
2. VEGP Technical Specifications, (Amendment 151/132), Sections(3.7.8 and 3.7.9)
3. VEGP Environmental Protection Plan, (Amendment 97/75)
4. 19000-C, E-0 Reactor Trip or Safety Injection, Version 32
5. 13150-1/2, Nuclear Cooling Water System, Version 46.1/38

B. 10 CFR 50.59 Screening

Identify the Updated FSAR design function which applies to this activity, if applicable:

FSAR 9.2.1.1.1.G-The NSCW system is designed to perform its cooling function following a loss of coolant accident (LOCA), automatically and without operator action, assuming a single failure coincident with a loss of offsite power.

Does the activity to which this screening applies, represent:

1. ☐ Yes ☒ No A modification, addition to, or removal of a structure, system, or component (SSC) such that a design function as described in the Updated FSAR is adversely affected?

   Basis for Answer: The proposed change is an LDCR that clarifies the operation of the NSCW tower return valves as described in FSAR sections 9.2.1 and TS Bases 3.7.9. The proposed change does not involve a physical change to any plant equipment. Therefore the proposed change does not involve the addition to or removal of a SSC, such that a design function as described in the Updated FSAR is adversely affected.

2. ☒ Yes ☐ No A change to procedures that adversely affects the performance or method of control of a design function as described in the Updated FSAR?

   Basis for Answer: FSAR paragraph 9.2.1.1.1.G states that "The NSCW system is designed to perform its cooling function following a loss of coolant accident (LOCA), automatically and without operator action, assuming a single failure coincident with a loss of offsite power." Since the proposed change relies upon manual operator action to align the tower spray valves under certain circumstances, the proposed change does involve a change to procedures that could affect the performance or method of control of a design function as described in the Updated FSAR.

3. ☐ Yes ☒ No An adverse change to a method of evaluation or use of an alternate method of evaluation from that described in the Updated FSAR that is used in establishing design bases or in the safety analysis?

   Basis for Answer: The proposed change is a clarification concerning the operation of the NSCW tower return valves. All of the parameters (e.g. NSCW flow, pressure, temperature, etc.) and analytical methods used to establish the design bases and safety analysis for the NSCW system remain bounding and unaffected by the proposed change. Therefore the proposed change does not involve an adverse change to a method of evaluation or use of an alternate method of evaluation from that described in the Updated FSAR that is used in establishing design bases or in the safety analysis.

4. ☐ Yes ☒ No A test or experiment not described in the Updated FSAR which is outside the reference bounds of the design basis as described in the Updated

FSAR or is inconsistent with the analyses or descriptions described in the updated FSAR?

Basis for Answer: The proposed change is a clarification to the FSAR and TS Bases on the operation of the NSCW return valves. The proposed change does not place the NSCW system in a configuration outside the reference bounds of the design basis as described in FSAR Table 9.2.1-2 (Items 67-70) nor does it place the system in a configuration for which it was not analyzed. Therefore the proposed change does not involve a test or experiment not described in the Updated FSAR which is outside the referenced bounds of the design basis as described in the Updated FSAR or is inconsistent with the analyses or descriptions described in the Updated FSAR.

5. ☐ Yes ☒ No A change to the Technical Specifications and/or Environmental Protection Plan incorporated in the operating license?

Basis for Answer: The proposed change is an LDCR that clarifies the operation of the NSCW tower return valves as described in FSAR section 9.2.1 and TS Bases 3.7.9. The proposed change does not affect the Limiting conditions of Operation or the surveillance requirements associated with any component in the NSCW system or as part of the Ultimate Heat Sink as described in Technical Specifications 3.7.8 and 3.7.9. Therefore the proposed change does not involve a change to the Technical Specifications. The Environmental Protection Plan incorporated in the Operating license remains unaffected as a result of this change.

IF the answer to all of the questions in section B is "NO", do not complete sections C and D. Sections C and D should also be deleted from the form. IF the answer to any of questions 1, 2, or 4 in section B is "YES", then only complete the answers to questions 1-7 in section C and complete the summary in Section D. IF only the answer to question 3 in section B is "YES", then only complete the answer to question 8 in section C and complete the summary in section D. IF question 5 is answered "YES", a license amendment is involved which requires NRC approval. Do not complete sections C and D if all aspects of the activity will be addressed in the license amendment request.

C. 10 CFR 50.59 Evaluation

1. ☐ Yes ☒ No ☐ N/A Does the proposed activity result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the Updated FSAR?

Basis for Answer: Neither the NSCW system nor the Ultimate Heat Sink as described in FSAR sections 9.2.1 and 9.2.5 respectively, are accident initiators, based upon the description of accidents analyzed in FSAR section 15.01.1, 15.0.1.2, 15.0.1.3 and 15.0.1.4. Therefore, the proposed change, which clarifies the operation of the NSCW tower return valves, cannot result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the Updated FSAR since the affected system is not a credible accident initiator.

2. ☐ Yes ☒ No ☐ N/A Does the proposed activity result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the Updated FSAR?

Basis for Answer: The NSCW system provides cooling to a number of safety related components as delineated in FSAR Table 9.2.1-1. All of the heat exchanged to the NSCW system is rejected to the outside environment via the Ultimate Heat Sink. All of these safety related components are credited in the FSAR Chapter 15 accident analyses with minimizing/mitigating the consequences of an accident. In order for the NSCW system and Ultimate Heat Sink to perform its safety function, the NSCW tower return valves ultimately have to be aligned to direct NSCW return flow to the spray header. Normally, the NSCW tower return valves are in Automatic control. However, under certain circumstances (e.g. facilitate maintenance) the valves may be placed in manual control, and aligned so that NSCW flow is returned directly to the tower basin or to the spray header. Analysis (DOEJ-06-19000 C V29-001, Version 2 attached to LDCR 2008039) has shown that under administrative control, there is sufficient time for the operator to recognize and place the tower return valves in the desired configuration and maintain NSCW temperature within analyzed limits. Manual control of the NSCW tower return valves is a credited safety function, as described in the FSAR Failure Modes and Effects Table 9.2.1-2, Items 67-70. Since NSCW temperature would remain within analyzed limits and thus would not have an adverse affect on any important to safety SSC, the proposed change, which clarifies the operation of the tower return valves in FSAR section 9.2.1 and TS Bases 3.7.9, would not result in more than a minimal increase in the likelihood of occurrence of a malfunction of a SSC important to safety previously evaluated in the Updated FSAR.

3. ☐ Yes ☒ No ☐ N/A Does the proposed activity result in more than a minimal increase in the consequences of an accident previously evaluated in the Updated FSAR?

Basis for Answer: The proposed change to clarify the manual operation of the NSCW return valves in FSAR section 9.2.1 and TS Bases 3.7.9 is consistent with the safety function of the NSCW tower return valves as described in FSAR Table 9.2.1-2, Items 67-70. Analysis has shown, that under administrative control, there is sufficient time for the operator to recognize and place the tower return valves in the desired configuration under worst case accident conditions. Since manual operation of the NSCW tower return valves is a credited safety function as described in the FSAR and analysis has shown that the operator has sufficient time available to recognize and place the tower return valves in the desired alignment, the NSCW temperature would remain within analyzed limits as described in FSAR section 9.2.5. Therefore, all equipment cooled by NSCW which is used to mitigate the consequences of an accident, would not be adversely affected, as a result of the proposed change. Consequently, the proposed change would not result in more than a minimal increase in the consequences of an accident previously evaluated in the Updated FSAR.

4. ☐ Yes ☒ No ☐ N/A Does the proposed activity result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the Updated FSAR?

   Basis for Answer: As previously stated, the proposed change would not result in the NSCW system being placed outside of analysis limits used in establishing the design bases. Therefore all equipment cooled by NSCW would be unaffected by the proposed change. Thus, the proposed change would not result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the Updated FSAR.

5. ☐ Yes ☒ No ☐ N/A Does the proposed activity create the possibility for an accident of a different type than any previously evaluated in the Updated FSAR?

   Basis for Answer: The proposed change would not result in the NSCW system being placed outside of analysis limits used in establishing the design bases. As such, all of the assumptions and analysis used in establishing the accident analysis would remain valid and bounding. Therefore the proposed change does not create the possibility for an accident of a different type than any previously evaluated in the FSAR.

6. ☐ Yes ☒ No ☐ N/A Does the proposed activity create the possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the Updated FSAR?

   Basis for Answer: The proposed change is an LDCR that clarifies the manual operation of the NSCW tower return valves as described in FSAR section 9.2.1 and TS Bases 3.7.9. Manual operation of the NSCW tower return valves is a credited safety function as described in FSAR Failure Modes and Effects Table 9.2.1-2, Items 67-70. Additionally, analysis has shown that under administrative controls there is sufficient time for the operator to recognize and manually position the tower return valves to the desired configuration prior to NSCW exceeding any of its design limits. Therefore, the proposed change would not create the possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the Updated FSAR.

7.a ☐ Yes ☒ No ☐ N/A Does the proposed activity have any impact on the integrity of the fuel cladding, reactor coolant pressure boundary, or containment? (Note: Answer Question 7b only if the answer to Question 7a is "YES.")

   Basis for Answer: As previously evaluated, the proposed change does not result in the NSCW system being placed outside of any analysis limit used in establishing the design bases. As such, all analysis and assumption used in the accident analyses remain valid and bounding. Therefore the proposed change would not have any impact on the integrity of the fuel cladding, reactor coolant pressure boundary, or containment.

7.b ☐ Yes ☐ No ☒ N/A Does the proposed activity result in a design basis limit for a fission product barrier as described in the Updated FSAR being exceeded or altered?

   Basis for Answer:

8. ☐ Yes ☐ No ☒ N/A Does the proposed activity result in a departure from a method of evaluation described in the Updated FSAR used in establishing the design bases or in the safety analyses?

Basis for Answer:

Provide a summary of the 10 CFR 50.59 evaluation in Section D. IF the answer to any of the questions in section C (excluding Question 7a) is "YES", a license amendment must be obtained from the NRC before the activity may be implemented. Do not complete section D if all aspects of the activity will be addressed in the license amendment request.

D. 10 CFR 50.59 Evaluation Summary

The 10 CFR 50.59 evaluation summary should include a brief description of the change and a concise summary of the responses to the evaluation questions provided in Section C.

Summary: The proposed change which is an LDCR that clarifies the manual operation of the NSCW tower return valves as described in FSAR section 9.2.1 and TS Bases 3.7.9 was evaluated and it was determined that the proposed change would not result in more than a minimal increase in the consequences of an accident, would not create any new accident nor would it result in an increase in the frequency of any accident previously evaluated in the Updated FSAR.

☒ Yes Check this box indicating a copy of the completed 10 CFR 50.59 screen/evaluation will be forwarded to Nuclear Licensing.

cooling tower spray headers and return the water directly to the cooling tower basin whenever the return water temperature is below 65°F. When necessary due to low ambient temperatures, freezing of an idle NSCW train or tower basin will be prevented by operating both NSCW trains and/or both NSCW transfer pumps, and by periodically operating all three NSCW pumps in each train. Idle piping, stagnant lines, and instrument sensing lines will be protected from freezing by either insulation, electric heat tracing, space heaters, or other means. The heat tracing is controlled by ambient sensors located outdoors in a location not exposed to sun or other heat sources so as to accurately measure the ambient temperature. The sensors are NEMA 4 rated for outdoor locations and are set to actuate at 38+5°F. A drain hole is provided in each of the four 12-in. supply headers to the tower spray nozzles to promote self-draining. Those portions of the spray header supply piping which will not self-drain are protected from freezing.

ADD

During freezing rain, enough heat is present from the basin water to prevent a heavy ice buildup.

The tower return valves (HV1668A/B and HV1669A/B) are normally maintained in automatic control. However, to facilitate maintenance, the valves may be aligned to return the water directly to the basin or to the spray header irrespective of return water temperature. When the tower return valves are aligned to return the water directly to the basin or to the spray header, they are administratively controlled and analysis has shown that there is sufficient time for the operator to place the valves in the configuration required, should an accident occur.

Makeup for each NSCW tower is normally provided by a connection with the plant makeup water wells. The backup source of makeup water is the Savannah River. NSCW tower basin water is the source of supply to the NSCW system and does not perform any other function. The makeup supply to the tower basins and provisions to ensure adequate net positive suction head (NPSH) for the NSCW pumps are discussed in paragraph 2.4.11.5.

The impact of long-term corrosion on the NSCW piping is compensated for by appropriate corrosion allowances and addition of a corrosion inhibitor.

Each NSCW cooling tower is provided with chemical treatment that employs biocide to prevent biological fouling, and a corrosion inhibitor. Chemical treatment is added to each tower basin as required. A portion of the system coolant is blown down, when makeup water is available, to prevent the accumulation of fouling agents. The blowdown rate may be controlled by conductivity or manually. Upon a safety injection signal or loss of external makeup, the tower blowdown is terminated and the concentration of total dissolved solids is allowed to increase. However, during the postulated 30-day design accident case (subsection 9.2.5), the solids buildup will not prevent acceptable operation of the cooling tower or associated NSCW equipment.

Air-operated valves CV-9446 and CV-9447 modulate NSCW tower blowdown to limit the buildup of total dissolved solids in the NSCW system. The valves close automatically upon receipt of a safety injection signal and are designed to fail closed upon a loss of offsite power. Thus, the valves will close automatically whenever required to conserve NSCW tower basin inventory. The valves also close whenever the respective NSCW train is not in service as part of the keep-full system.

Failure of a tower blowdown valve to close when required will be indicated by valve position lights on the main control board and by a high flow alarm in the keep-full intertie. Additionally, this condition will be identified by basin level verification required by the Technical Specifications or, in a post-accident situation, by the valve status verification required by the emergency instructions. Isolation of the blowdown line can be effected by closing manual

B 3.7 PLANT SYSTEMS

B 3.7.9 Ultimate Heat Sink (UHS)

BASES

BACKGROUND

The UHS provides a heat sink for processing and operating heat from safety related components during a transient or accident, as well as during normal operation. This is done by utilizing the Nuclear Service Cooling Water (NSCW) System and the Component Cooling Water (CCW) System.

The UHS consists of the NSCW System mechanical draft towers. Two 100% capacity redundant NSCW towers are provided for each unit. One tower is associated with each train of the NSCW System. Each NSCW tower consists of a basin that contains the ultimate heat sink water supply and an upper structure that contains four individual fan spray cells where the heat loads are transferred to the atmosphere. Each spray cell contains one safety-related temperature controlled fan. Instrumentation is provided for monitoring basin level and water temperature. The tower basins each contain a safety-related transfer pump to permit the use of the combined storage capacity of the basins. The combined storage capacity of two tower basins provides greater than a 30 day cooling water supply assuming the worst combination of meteorological conditions and accident heat loads which maximize the tower heat load, basin temperature, and evaporative losses.

ADD

The tower return valves (HV1668A/B and HV1669A/B) are normally maintained in automatic control. However, to facilitate maintenance, the valves may be aligned to return the water directly to the basin or to the spray header, irrespective of return water temperature. When the tower return valves are aligned to return the water directly to the basin or to the spray header, they are administratively controlled and analysis has shown that there is sufficient time for the operator to place the valves in the configuration required, should an accident occur.

Additional information on the design and operation of the system, along with a list of components served, can be found in FSAR, Subsection 9.2.5 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The UHS is the sink for heat removed from the reactor core following all accidents and anticipated operational occurrences in which the unit is cooled down and placed on residual heat removal (RHR) operation. Its maximum post accident heat load occurs 20 minutes after a design basis loss of coolant accident (LOCA). Near this time, the unit switches from injection to

(continued)

ATTACHMENT 1 TO
LDCR 2008059 VERSION 1.0
PAGE 1 of 3

Documentation of Engineering Judgment

DOEJ-06-19000 C V29-001

NSCW SPRAY RESTORATION from HARD BYPASS EVALUATION

Version Record

Version No.	Description	Originator/Date Signature	Reviewer/Date Signature
1	Original issue (pp 1-2)	See Original J A Wehrenberg 1-6-06	See Original J M Morson 1-6-06
2	Update for MUR (revise pp 1 - 2)	J A Wehrenberg 8-13-08	J M Morson 8-13-08

SOUTHERN COMPANY
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Purpose: This evaluation provides a justification for the NSCW heat up times in PAF-19000-C-V29-0ATT (Ref. 1).

Design Inputs:

1. PAF-19000-C-V29-0ATT, dated June 11, 2004
2. 1X2D05E001, R15
3. 1X4DB149-2, R5
4. 1X4DB149-4, R5_
5. Crane Technical Paper 410
6. X4C1202V54, R1 and MC-V-07-0083, V1
7. FSAR, Version 13, 11/30/05

Evaluation:

From reference 2, the tower diameter is 88 ft and the depth is 80.25 ft. Then the volume of the tower is

$$\pi (88/2)^2 \text{ x } 80.25 \text{ ft}^3 \text{ x } 7.4805 \text{ gal / ft}^3 = 3.65 \text{ x } 10^6 \text{ gallons.}$$

From references 3 and 4, the NSCW post-LOCA flow is 16388 gpm. Then for no mixing in the basin (*i.e.*, plug flow) the time for the hot return water to reach the pump suction would be

$$3.65 \text{ x } 10^6 \text{ gal / [16388 gpm x 60 min/hr]} \approx 3.7 \text{ hours.}$$

If the LOCA heat load is uniformly mixed in the tower basin (and evaporation and heat transfer are neglected), the water inventory will heat up from the initially assumed 90 °F to the 95 °F design limit relatively quickly. From reference 5, the heat content of the basin water is interpolated to be

$$90 \text{ °F} \Rightarrow 58.0 \text{ Btu/lb} \qquad 95 \text{ °F} \Rightarrow 63.0 \text{ Btu/lb} \qquad 98 \text{ °F} \Rightarrow 66.0 \text{ Btu/lb.}$$

From 6 (page 17), for a single train of NSCW, the maximum heat load during the first half hour after the LOCA is about $3.13 \text{ x } 10^8$ Btu/hr, and the time to reach 95 °F is

$$[3.65 \text{ x } 10^6 \text{ gal x } 8.34 \text{ lb/gal x } (63 - 58) \text{ Btu/lb}] / 3.13 \text{ x } 10^8 \text{ Btu/hr} = 0.49 \text{ hr.}$$

The FSAR (Ref. 7, §9.2.5.2.4) indicates a slightly higher temperature for a limited time is acceptable:

> In addition, the peak basin temperature during three-fan cooldown operation will exceed the nominal design maximum of 95°F, reaching approximately 97°F for Unit 1 and 98°F for Unit 2 6 to 8 h after RHR initiation, and remaining above 95°F for a total of 20 h for Unit 1 and 35 h for Unit 2 during cooldown. The NSCW tower transfer pump may be used

to transfer cooler water from the idle basin which would help keep the NSCW temperature down. Even if the peak basin temperature exceeds 95°F, the excess is less than 3°F and exists for a relatively short period in terms of total plant life and in terms of total RHR system operation over the plant life. Because of these considerations, and because three-fan cooldown has a very low probability of occurrence, it is concluded that there are no operational problems associated with this mode of operation.

To reach 98 °F takes [3.65 x 10^6 gal x 8.34 lb/gal x (66 – 58) Btu/lb] / 3.13 x 10^8 Btu/hr = 0.79 hr. As soon as the spray is returned to service, the return water temperature will reduce significantly, and the basin temperature will start decreasing. Since the basis inventory will turn over about every 4 hours, the water temperature would be expected to return to the as-analyzed temperature profile within the 35 hours currently discussed in the FSAR.

MUR power uprate will increase the full power level by 1.7%. This will increase the core decay heat (but not system operating temperatures) by a similar amount. Assuming all accident heat sources are increased by 1.7%, the time to reach 98 °F would decrease to 0.79 hr / 1.017 = 0.77 hr. 2

Conclusion:

Greater than ½ hour is available to return the spray to service; and once tower spray is returned to service the basin temperature will quickly return to the as-analyzed temperature profile.

Vogtle Electric Generating Plant – Units 1 and 2
Additional Information Regarding NRC Supplemental Inspection Report
05000424/2008009 and 05000425/2008009

Enclosure 2

NSCW Spray Valve Operability Position Paper

NSCW Spray Valve Operability Position

The tower return valves (HV1668A/B) have a control room handswitch that controls their operation. The handswitch (HS-1668A) has three positions which are maintained. Note that this handswitch controls the operation of both the spray and bypass valves. The handswitch can be placed in "Open Bypass", "Open Normal", or "Auto". Assuming a train of NSCW is inservice, when you place the handswitch in Open Bypass, the bypass valve (HV1668B) opens and the spray valve (HV1668A) closes. In this configuration, all NSCW return flow is directed to the tower basin, bypassing the spray. The valves will remain in this position as long as any NSCW pump in that train is operating irrespective of NSCW return water temperature. Similarly, if the handswitch is placed in Open Normal, the spray valve will open and the bypass valve will close. In this configuration, all NSCW return flow is directed to the tower spray. The valves will remain in that position as long as a NSCW pump in that train is operating, irrespective of NSCW return water temperature. If the handswitch is placed in Auto, the spray valve will open and bypass valve will close when return water temperature is greater than 75 degrees, and if return water temperature drops below 65 degrees, the bypass valve will open and the spray valve will close.

When a train of NSCW is shutdown, as the last pump is stopped and its breaker opens, an interlock is satisfied that closes both the spray and bypass valve. This ensures the system stays full and minimizes the effects of water hammer on subsequent pump start. When a train of NSCW is started up, as soon as the first NSCW pump is started, an interlock is satisfied that partially opens either the spray or bypass valve. If the handswitch for the tower return valves was in Auto, the valve that partially opened would be dependent upon the temperature in the return header (i.e. if return temperature was high the spray valve would partially open, if return temperature was low the bypass valve would partially open). If the handswitch was in Open Normal, the spray valve would partially open. Similarly, if the handswitch was in Open Bypass, the Bypass valve would partially open. Once an Agastat time delay relay timed out, either the spray or bypass valve would then fully open dependent upon the position of the return valve handswitch.

During a LOSP, the operation of the tower return valves would be the same as described above, although there would be some time delays involved as a result of when the loads were sequenced back on. It should be noted that the tower return valves do not receive an actuation (SI) signal. It should also be noted that the spray valve is interlocked with one of the NSCW tower fans such that whenever the spray valve is open, one NSCW fan starts and when the spray valve is closed the fan stops. All of the other fans are started automatically on return water temperature. The temperature loop that controls the return valves is independent of the temperature loops that control the fans.

Position

NSCW is operable with return valves in manual control.

Technical Specification Requirements

Technical Specification 3.7.9 provides the Limiting Condition of Operations (LCO's) and surveillance requirements (SR's) for the Ultimate Heat Sink (UHS). For the UHS to be operable: (1) the basin level has to be greater than or equal to the specified level (SR 3.7.9.1) (2) the basin water temperature is maintained less than or equal to 90 degrees (SR 3.7.9.2) (3) the required number of fans/spray cells are operable which is verified by operating each of the fans for at least 15 minutes every 31 days (SR 3.7.9.3) and (4) a NSCW transfer pump has to be operable (SR 3.7.9.4). During the time the return valves are being manually controlled, the system operating procedure requires a caution tag to be placed on the return valves handswitch, the basin water temperature to be maintained less than 90 degrees and return water temperature to be monitored by the Operators on the plant computer. In the event, return water temperature exceeds 85 degrees and continues to trend up, the procedure instructs the operator to place the tower return valve handswitch back in Auto. For cases where the temperature loop that controls the return valves is taken out of service, for maintenance, the caution tag would remind the operator of this condition, and based upon training and experience, the operator would place the valve in Open Normal. Once the return valve handswitch was placed in Open Normal, the return valve would open, one of the tower fans would start, and the bypass valve would close. Similarly, if an accident were to occur, during the time the tower return valves are being manually controlled, the Emergency Operating Procedure, in the initial operator actions, contains a step that instructs the operator to place the tower return valves handswitch in Automatic. If the temperature loop had been removed from service for maintenance, the caution tag on the handswitch would remind the operator of this condition, and based upon training and experience the operator would place the handswitch in Open Normal. Once the return valve handsitch was placed in Open Normal, the return valve would open, one of the tower fans would start, and the bypass valve would close. The capability to open or close the tower return valves either manually or automatically from the control room is required to ensure UHS operability. If a valve was incapable of being stroked, the UHS would be rendered inoperable. All of the UHS surveillance requirements would have continued to be met in this configuration.

Technical Specification 3.7.8 provides the LCO's and surveillance requirements for the NSCW system. For a train of NSCW to be considered operable (1) each manual, power operated and automatic valve in the flowpath servicing safety related equipment that is not locked, sealed or otherwise secured in position, is in the correct position (SR 3.7.8.1) (2) each automatic valve in the flowpath that is not locked sealed or otherwise secured in position actuates to the correct position on an actual or simulated actuation signal (SR 3.7.8.2) and (3) each NSCW system pump starts automatically on an actual or

simulated actuation signal (SR 3.7.8.3). During the time the tower return valves are in manual control (either Open Normal or Open Bypass), the position of the valves would not have any affect on a NSCW pump start (i.e. there is no permissive between return valve position and NSCW pump start). Therefore, surveillance requirement SR 3.7.8.3 would be unaffected by the manual control of the tower return valves. Additionally, these valves do not receive a SI actuation signal. They are either automatically controlled by return water temperature or manually controlled by the operator. Therefore surveillance requirement SR 3.7.8.2 is not applicable to these valves. Lastly, the "correct position" for the tower return valves as it relates to SR 3.7.8.1 is relative. As long as either one of the tower return valves are open, when a train of NSCW is in operation, a flowpath is established. Ultimately, for a design bases LOCA, the spray valve would have to be open to reject heat to the atmosphere. However, to satisfy the requirements of SR 3.7.8.1, the return valves can be open/closed dependent upon return temperature, whether or not the train is operating, or handswitch position.

Summarizing the Technical Specification requirements, in accordance with Technical Specification 3.7.9, the ultimate heat sink must be able to perform its safety function and be operable per the requirements. The tower spray valve has to be capable of opening and bypass valve has to be capable of closing. The bases state the tower return valves are normally maintained in automatic control. However, to facilitate maintenance, the valves may be aligned to return the water directly to the basin or the spray header, irrespective of return water temperature. When the tower return valves are aligned to return the water directly to the basin or to the spray header, they are administratively controlled and analysis has shown that there is sufficient time (i.e., more than half an hour) for the operator to place the valves in the configuration required, should an accident occur.

Therefore, the NSCW tower return valves can perform its safety function (i.e., open on high NSCW return temperature to admit water to NSCW tower spray header for cooling; also, can be opened by remote manual control from either the control room or the shutdown panel). The spray valve is capable of performing its safety function in automatic or by manually positioning the valve.

Basis of Position

A review of the Safety Evaluation Report (SER) for VEGP dated June 1985 contains the following information as it relates to NSCW and the UHS:

2.4.11.2 The water is returned to the cooling tower spray manifolds or in the event of low return temperature from the NSCW system, the spray manifolds are bypassed, and the water is returned directly to the basin.

7.3.2.9 On receipt of an SI or loss of offsite power signal, all preferred pumps receive an automatic start signal. If one of the preferred pumps does not start, the standby pump in the same train receives a subsequent start signal. An SI

signal also isolates the cooling tower blowdown lines. Manual initiation is also provided from the control room or from the remote shutdown panels.

9.2.1 In order to further preclude waterhammer in an idle train or on pump restart following a loss of offsite power, the NSCW system includes: (1) interlocks and pressure switches to close both tower valves (spray header and cold weather bypass valves) whenever the NSCW pumps in that train are not operating and to allow normal operation when the pumps are in service.

9.2.5 To guard against icing or freezing in the return line to the cooling tower, two valves function to bypass the cooling tower spray headers and return the water directly to the basin.

Based upon the descriptions contained in the SER, no credit is cited for "Automatic" operation of the NSCW tower return valves, and as noted from paragraph 7.3.2.9 cited above, manual action is recognized by the NRC as part of the licensing basis of NSCW and the UHS. In fact, section 9.2.1 of the SER as quoted above uses the phrase "normal operation" when describing the operation of the tower return valves when the pumps are in service. FSAR paragraph 9.2.1.1.G states: "The NSCW system is designed to perform its cooling function following a loss of coolant accident (LOCA) automatically and without operator action, assuming a single failure coincident with a loss of offsite power." This statement does accurately state the design of the NSCW system. When all components in the NSCW system are in their standard alignment, the NSCW system would perform its design function automatically and without operator intervention. However, as described above, the spray valve can be manually opened from the control room handswitch and conservative analysis has shown that there is more than 0.5 hours available for the operator to return the spray valve to service prior to exceeding the FSAR temperature limits. This analysis conservatively assumes that the initial basin temperature was at the maximum Technical Specification temperature of 90 degrees at the start of the accident neglects evaporation, heat transfer to NSCW structures, and limits the water temperature to 3 degrees below the maximum analyzed transient temperature of 98°F. As discussed in section 9.2.5.2.4 of the FSAR, a short-term excursion to 98°F over a span of 20 to 30 hours is acceptable. This is consistent with the safety function of the tower return valves as described in FSAR Table 9.2.1-2 which states that the safety function of the spray valve is to "Open on high NSCW return temperature to admit water to NSCW tower spray header for cooling; also, can be opened by remote manual control from either the control room or the shutdown panel."

Normal makeup is from the well water pumps and this is an automatic function. However since well water is not safety related it can not be relied upon during an accident. The same is true for river water which is the backup water supply. However, to meet the 30 day mission time, per FSAR section 9.2.5.3.B, after one day of operation, one train of NSCW has to be shutdown. Inventory from that basin is then transferred from the shutdown basin to the operating

basin using a transfer pump. Stopping the train after the first day and transferring the basin contents is all under operator manual control.

Also, TS 3.7.9 allows for a transfer pump to be out of operation for up to 30 days. However, after 8 days, an alternate method for basin transfer has to be in place. This is somewhat unique in that the alternate method does not have to use safety related components and any alternate method would be highly dependent upon manual operator actions.

Conclusion

Manual operation of NSCW and the UHS components is required and has been shown to be an acceptable mode of operation. It is also consistent with other manual actions for this system where sufficient time and methods are provided that the function of the system is maintained.

Therefore based upon a review of the FSAR, SER, plant operating procedure and Technical Specifications, it can be concluded that manual operation of the tower return valves is consistent with the licensing bases for VEGP.