VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

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U.S. Nuclear Regulatory Commission
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VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
ANNUAL CHANGES, TESTS, AND EXPERIMENTS REPORT
REGULATORY COMMITMENT EVALUATION REPORT

Virginia Electric and Power Company hereby submits the annual report of Changes, Tests, and Experiments pursuant to 10 CFR 50.59(d)(2) implemented at Surry Power Station. The Attachment provides the descriptions and summaries of the Regulatory Evaluations and the Regulatory Commitment Change Evaluation completed in 2020.

Should you have any questions regarding this report, please contact Michael M. True, Jr. at (757) 365-2446.

Very truly yours,

Johnny Henderson
Director Nuclear Safety & Licensing
Surry Power Station

Attachment

Commitments made in this letter: None

cc: United States Nuclear Regulatory Commission, Region II
Marquis One Tower, Suite 1200
245 Peachtree Center Avenue, NE
Atlanta, Georgia 30303-1257

NRC Senior Resident Inspector
Surry Power Station

Attachment
Surry Units 1 & 2
10 CFR 50.59 Changes, Tests, and Experiments, and
Regulatory Commitment Evaluations for 2020

ETE-CCE-2018-0002 **Regulatory Evaluation** **04/16/2020**

Description:

In response to US NRC Regulatory Issue Summary, RIS 2015-06, a License Basis Review (LBR), a Design Basis Review (DBR) and a Discovery Walkdown (DW) were conducted to verify the current licensing basis with respect to Tornado Missile Protection (TMP) and to identify all TMP potential vulnerabilities. A 50.59 Screen was performed for all associated TMP, civil-related (Corrective Actions and Condition Reports) that were identified for Surry Power Station (SPS) in response to RIS 2015-06. From that 50.59 Screen, the following two (2) 50.59 activities did not screen out and were classified as introducing an adverse change to a method of evaluation described in the SAR:

1. SWEC Calculation No. SU-CALC-SAC-14247.03-DSS-27-2 uses plastic design methodology per AISC Specification, Part 2, 7th Edition, to qualify the structural steel main bents of the SPS Fuel Building for 360-mph (siding off) tornado wind loadings. The use of plastic design allows the designer to take advantage of inelastic behavior in a structure, which is a less conservative methodology than elastic design, as referenced in SPS UFSAR, Sections 15.2.3 and 15.6.1. Hence, the change in design methodology from elastic design to plastic design DOES result in an adverse change to a method of evaluation. The scope of this 50.59 Evaluation activity is to review the use of plastic design methodology performed on the structural steel main bent of the SPS Fuel Building to determine if NRC review and approval is required.

2. Discussions, with reference to the methodologies contained in Appendix C of SWECO 7703, "Missile-Barrier Interaction – A Topical Report" will be provided to explain the efficacy of the standard 2-foot thick, reinforced concrete tornado missile barrier design against deformations due to the overall structural response of structures from tornado missile impact. Currently, there are no discussions provided in affected SPS UFSAR, Sections 15.2 and 15.2.3, to evaluate or explain the acceptance criteria for deformations of reinforced concrete, Tornado Criterion "T" structures, subjected to tornado missile impact loads. SWECO 7703 was issued in 1977 to provide justification for this SWEC standard missile barrier design. The 1977 issue date of SWECO 7703 occurred after the original licensing dates for both SPS Units 1 & 2 (1972 & 1973); hence, references to SWECO 7703 would represent a new method of evaluation. All new methodologies must be initially considered adverse and evaluated in a 50.59 Evaluation. Hence, this activity DOES result in an adverse change in a method of evaluation and screens in. See Attachments F2, F6 and G of the parent document for further details of these references to SWECO 7703, Appendix C. The scope of this 50.59 Evaluation activity is to review the methodology in SWECO 7703, Appendix C, to evaluate acceptable deformations due to the overall structural response of reinforced concrete, Tornado Criterion "T" structures, subjected to tornado missile impact, to determine if NRC review and approval is required.

Summary:

The evaluation determined the following:

1. SWEC Calculation No. SU-CALC-SAC-14247.03-DSS-27-2, Rev. 0, uses plastic design methodology per AISC Specification, Part 2, 7th Edition, for evaluation of design modifications performed in Design Change No. DC 83-20 to qualify the structural steel main bents of the SPS Fuel Building for 360-mph (siding off) tornado wind loadings. SPS UFSAR, Section 15.6.1, states that "Structural steel design shall conform to the 1963 issue of the Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings of the American Institute of Steel Construction", which is based on elastic design methodology. Elastic design methodology limits allowable stresses to 0.9 Fy, as stated in SPS UFSAR, Section 15.2.3. The associated 50.59 Screen determined that the use of plastic design methodology, in lieu of elastic design methodology, constituted an adverse change in a method of evaluation; hence, this 50.59 Evaluation was performed. Based on the evaluation, the SER issued for the 1975 PSAR at Clinton Power Station meets the applicable terms, conditions and limitations for the use of plastic design methodology that were performed in the affected SWEC Calculation. Therefore, this activity does NOT result in a departure from a method of evaluation described in the SAR used to establish the design basis for the structural steel bents of the SPS Fuel Building. Therefore, this SER may be used to approve the use of plastic design methodology for steel structures, subjected to tornado wind load at SPS, such as those that were applied in the subject SWEC Calculation without the need to obtain prior US NRC approval.

2. A clarifying discussion, with reference to the methodologies contained in Appendix C of SWECO 7703, "Missile-Barrier Interaction–A Topical Report" will be cited to explain the efficacy of the standard 2-foot thick, reinforced concrete tornado missile barrier design against deformations due to the overall structural response from tornado missile impact. These proposed references will be inserted into SPS UFSAR, Sections 15.2 and 15.2.3. Based on the evaluation, the SER issued for the 1985 SER for Beaver Valley, Unit 2 meets the applicable terms, conditions and limitations for the use of the methodologies contained in SWECO 7703, Appendix C, which evaluates deformations due to the overall structural response from tornado missile impact, in reinforced concrete structures representative of Tornado Criterion "T" structures and tornado missile at SPS. Therefore, this activity does NOT result in a departure from a method of evaluation described in the SAR. The 1985 SER for Beaver Valley, Unit 2 may be used to approve the use of this methodology, without the need to obtain prior US NRC approval.

Commitment Change Evaluation **05/27/2020**

Original Commitment Summary:

Commitments to GL 89-13 were made to prevent macrofouling in safety related heat exchangers, such as the recirc spray heat exchangers (RSHX's). A Commitment Change Evaluation (in letter Serial Number 16-064 dated 1/9/2015) decreased the frequency of flow testing all Recirculation Spray Heat Exchanger (RSHX) Service Water (SW) flowpaths from the original commitment of one train every other refueling outage (RFO) to every train every eighth refueling outage. (Per SN 15-088 2-RS-E-1A, D will begin this frequency in 2020.) Also, periodic maintenance of the RSHXs and related SW piping will be performed on the same schedule.

Revised Commitment Summary:

2-OSP-SW-007, SERVICE WATER FLOW TEST OF RECIRCULATION SPRAY HEAT EXCHANGERS 2-RS-E-1A AND 2-RS-E-1 D, will be performed in a refueling outage no later than 2R31.
This will result in a frequency between flow tests of 14RFO for this one header. This will be a one-time extension, which applies to the 2C service water (SW) header only. The committed frequency will remain 8RFO following this one exception. If 2-OSP-SW-007 is not done in 2R30, a borescope inspection of 2-RS-E-1A and 2-RS-E-1 D will be completed, and a flow test will be performed if unsatisfactory results are obtained. The maintenance and inspection of the 2C header will remain on its 8RFO frequency and was last performed in 2014 (next due date 2026).

Justification:

UFSAR Chapter 18.2.17 states that SPS will manage the effect of age-related degradation in service water by complying with NRC GL 89-13. SPS original response to GL 89-13 did NOT include flow testing of RSHX; however, the commitment to perform periodic flow testing was added following LER-90-014-01 and its associated NOV. Many corrective actions were implemented as a result of that LER which have all but eliminated macrofouling concerns for RSHX. Even though the macrofouling has been largely eliminated, SPS will still continue to visually inspect the piping, to confirm that all age-related degradation mechanisms are being successfully managed. The current SW Pipe Inspection and Maintenance Strategy for the RSHX Supply piping. Maintenance activities performed are considered to meet the intent of Generic Letter 89-13. These strategies support deferral of Maintenance and Flow Testing activities until a refueling outage no later than 2R31 on 2-RS-E-1A and 2-RS-E-1 D.

bc (electronic distribution):

M. Adams, Director Nuclear Engineering and Fuel
J. Henderson, Director Nuclear Safety and Licensing, SPS
R. Philpot, Manager Licensing and EP, SPS
C. Patterson, Manager Corporate Risk
K. Barret, Nuclear Regulatory Affairs

Verification of Accuracy:

1. 10 CFR 50.59 Evaluation: ETE-CCE-2018-0002 (retrievable using DocTop).
2. Email from Lotus Schwartz with containing direction for obtaining SPS 10 CFR 50.59 Evaluations.
3. Snapshot of DocTop containing SPS 10 CFR 50.59 Evaluations.

Action Plan:

None

Commitments (Stated or Implied):

None

Changes to the UFSAR or Topical Report:

None