

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

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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

Dear Sir or Madam,

Virginia Electric and Power Company hereby submits the annual report of Changes, Tests, and Experiments pursuant to 10CFR50.59(d)(2) implemented at Surry Power Station. Attachment 1 provides the descriptions and summaries of two Regulatory Evaluations completed in 2016 and one completed in 2017. There were no Regulatory Commitment Change Evaluations completed in 2017.

Should you have any questions regarding this report, please contact Barry Garber at (757) 365-2725.

Very truly yours,



Robert M. Garver II
Director Nuclear Safety & Licensing
Surry Power Station

Attachment

Commitments made in this letter: None

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

NRC Senior Resident Inspector
Surry Power Station

IE47
NRR

Attachment 1
Surry Units 1 & 2
10 CFR 50.59 Changes, Tests, and Experiments

SPS-EVAL-2016-0006

Regulatory Evaluation

06/02/2016

Description:

This evaluation reviewed the installation of digital temperature controllers for Unit 1 and Unit 2 Refueling Water Storage Tank (RWST) level instrumentation. The RWST level instruments provide RWST level signals to the Engineered Safeguards actuation system. The RWST level instruments are not physically connected to the temperature controllers but depend on them to ensure functionality in freezing weather. The replacement nuclear qualified RWST level freeze protection controllers provide sensing, indication, and relay operation that emulate the original controllers. Power supply schemes are maintained. The new controllers were evaluated to be equally reliable to the currently installed controllers. The change requires a regulatory evaluation due to the use of digital heat trace temperature controllers.

Summary:

The evaluation determined the following:

1. The equipment affected by the modification is designed for accident mitigation and cannot initiate an accident. Therefore the frequency of occurrence of an accident due to the modification is not increased.
2. This evaluation reviews the installation of Safety Related (SR), seismically qualified instrumentation with demonstrated reliability and no connectivity that could trigger a common cause failure. There is no change in redundancy, diversity, or separation between trains. Software quality has been validated. The failure modes of the digital controllers are the same as those of the existing analog controllers. The SR electrical supply breaker will continue to protect the vital bus from downstream faults. Therefore:
 - a. an increase in the likelihood of a malfunction of an System, Structure or Component (SSC) is less than minimal.
 - b. the increase in consequences of an accident is less than minimal.
 - c. the increase in consequences of a malfunction of an SSC important to safety is less than minimal.
 - d. there is no plausible possibility of a malfunction of an SSC important to safety with a different result than previously evaluated in the SAR.
3. The modification does not involve a design basis limit for a fission product barrier or a method of evaluation.

Attachment 1

Surry Units 1 & 2

10 CFR 50.59 Changes, Tests, and Experiments

SPS0-EVAL-2016-0010

Regulatory Evaluation

10/27/2016

Description:

This evaluation reviewed a modification that defeats the UFSAR described automatic rod withdrawal (ARW) function of the Rod Assembly Control system. Automatic rod insertion, manual rod operation, and protective tripping functions are not affected. The modification was performed on Units 1 and 2 in order to prevent undesired rod withdrawal (positive reactivity addition) due to process noise or control system malfunction. Defeat of the ARW function prevents automatic rod withdrawal control system response to load increases. Manual action is now required to position the control rods in response to an increase in load. This constitutes substitution of manual control for automatic control and therefore this activity required a 10CFR50.59 evaluation. Note that the automatic control function has not typically been used at Surry; unit loading is performed manually.

Summary:

1. Rod assembly control does not interface with the Reactor Protection System (RPS) or the Engineered Safety Feature Actuation System (ESFAS). Existing UFSAR Chapter 14, Safety Analysis, sections concerning control rod assemblies remain bounding. Plant response to operational transients described in UFSAR Chapter 7, Instrumentation and Control, remains stable. Therefore, the increase in frequency of occurrence of an accident described in the Safety Analysis Report (SAR) is less than minimal.
2. The modification to the automatic rod assembly control system disables ARW by disconnecting leads that transmit the ARW signal from the Reactor Control system to the Rod Control system. No additional equipment is installed, and no new failure modes are introduced. The increase in likelihood of malfunction of a plant SSC (rod assemblies, rod control and protection functions) due to operational effects of defeating ARW is less than minimal.
3. Automatic rod assembly withdrawal is not credited for accident mitigation. The presence or absence of ARW does not impact the consequences of any previously evaluated accident.
4. No new failure modes have been introduced. UFSAR Chapter 14 events have been evaluated for the impact of this activity on control rod assembly function in automatic and in manual control. Defeat of ARW does not affect automatic control rod insertion or manual rod control. There is no possibility of a failure of an SSC important to safety with a different result than previously evaluated. There is no change to RPS or ESFAS set points, instrument uncertainty, or safety analysis limits. Therefore, the modification does not create the possibility of an accident of a different type than previously evaluated.

5. No design basis limit for a fission product barrier is exceeded or altered.
6. The transients were analyzed using the existing LOFTRAN computer code with Surry input parameters. Therefore, this activity does not result in a departure from a method of evaluation described in the SAR.

Attachment 1

Surry Units 1 & 2

10 CFR 50.59 Changes, Tests, and Experiments

SPS0-EVAL-2017-0005

Regulatory Evaluation

12/19/2017

Description:

This evaluation reviewed a licensing basis change for Surry Units 1 and 2 which incorporates a minor revision (Minor Revision 2) of NRC approved Topical Report VEP-FRD-42-A, "Reload Nuclear Design Methodology," Revision 2. This activity added a new core physics methodology, CMS5, as described in NRC approved Topical Report SSP-14-P01/028-TR-P-A, "Generic Application of the Studsvik Scandpower Core Management System to Pressurized Water Reactors." The core physics analytical model, CMS5, was found to be acceptable for core reload design. This Evaluation also reviewed and found acceptable the removal of references to and descriptions of the now obsolete PDQ Two Zone/NOMAD analytical model.

A 10CFR50.59 evaluation was required because the changes described above were to methods of evaluation described in the UFSAR that were outside the limitations identified in topical report, VEP-FRD-42-A, and were therefore considered adverse.

Evaluation:

The justification for making these changes without submitting a license amendment relies on the provisions under 10CFR50.59 for licensees to change from one method of evaluation to another. The USA 50.59 Resource Manual provides guidance concerning when a change is not considered a departure from a method of evaluation described in the UFSAR. The change is not a departure if it involves the "...Use of a new NRC-approved methodology (e.g., new or upgraded computer code) to reduce uncertainty, provide more precise results, or other reason, provided such use is:

- a. Based on sound engineering practice
- b. Appropriate for the intended application
- c. Within the limitations of the applicable SER"

Based upon the conclusions of a GL 83-11, Supplement 1 evaluation, as directed by the USA 50.59 Resource Manual, incorporating CMS5 into the list of VEP-FRD-42-A analytical models meets these three criteria.

Therefore, the inclusion of the CMS5 methodology as a new analytical model to VEP-FRD-42-A is fully consistent with the provisions of 10CFR50.59.