

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

March 31, 2021

United States Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D. C. 20555

Serial No. 21-094  
NAPS/RAP  
Docket Nos. 50-338, 339  
License Nos. NPF-4, NPF-7

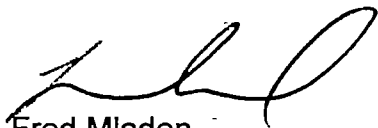
Gentlemen:

**VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION ENERGY VIRGINIA)**  
**NORTH ANNA POWER STATION UNITS 1 AND 2**  
**SUMMARY OF FACILITY CHANGES, TESTS AND EXPERIMENTS**

Pursuant to 10 CFR 50.59(d)(2), a report containing a brief description of any changes, tests, and experiments, including a summary of the evaluation of each, must be submitted to the NRC, at intervals not to exceed 24 months. Attachment 1 provides a summary description of Facility Changes, Tests and Experiments identified in 10 CFR 50.59 Evaluations performed at the North Anna Power Station during 2020.

If you have any questions, please contact Marcus A. Hofmann at (540) 894-2100.

Very truly yours,



Fred Mladen  
Site Vice President

Attachments

1. 10 CFR 50.59 Summary Description of Facility Changes, Tests and Experiments
2. Commitment Change Evaluation Summary

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

NRC Senior Resident Inspector  
North Anna Power Station

IE47  
NRR

**ATTACHMENT 1**

**10 CFR 50.59 SUMMARY DESCRIPTION OF  
FACILITY CHANGES, TESTS AND EXPERIMENTS**

**NORTH ANNA POWER STATION UNITS 1 AND 2  
VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION ENERGY VIRGINIA)**

## NORTH ANNA UNITS 1 AND 2

### 10 CFR 50.59 SUMMARY DESCRIPTION OF FACILITY CHANGES, TESTS AND EXPERIMENTS

#### 10 CFR 50.59 Evaluation – Document Evaluated: DC-NA-20-01042 Rev. 0

**Brief Description:** This activity removes from the plant licensing and design basis the requirement to provide complete missile protection on the following SSCs through the adoption of a new method of evaluation, NEI 17-02 Rev. 1B (Tornado Missile Risk Evaluator). Note that there are no physical plant changes associated with this activity, as the SSCs lacked the originally required licensing basis missile protection. Nonetheless, due to the same net effect, this activity will be assessed as if the physical missile protection is being removed from the affected SSCs.

- 2"-CH-34/36/93-153A-Q3
- 1-CH-TK-1A/B/C
- 1-IA-TK-4A/4B/4C
- 4"-WAPD-439-601-Q3
- 6"-WAPD-401-601-Q3
- 6"-WAPD-402-601-Q3
- 4"-WAPD-39-601-Q3
- 6"-WAPD-1-601-Q3
- 6"-WAPD-2-601-Q3
- 02-BLD-STR-RCEH1-MISC
- 01-BLD-STR-RCEH1-MISC
- 01-BLD-MBAR-RCEH1A-MISC
- 01-BLD-MBAR-RCEH1B-MISC
- 02-BLD-MBAR-RCEH1A-MISC
- 02-BLD-MBAR-RCEH1B-MISC

Note that several components which comply with the current licensing basis were analyzed in TMRE due to differences between the current licensing basis and NEI 17-02 Rev. 1B. The licensing basis for these components stands as is and TMRE is not credited as part of these components' licensing basis. Therefore, there is no activity or change for these components and no 10 CFR 50.59 review is required.

**Reason for Change:** Pursuant to Regulatory Issue Summary (RIS) 2015-06 (Ref. 1), North Anna Power Station performed multiple reviews to identify non-conformances between the physical plant configuration/design basis and the current licensing basis (Ref. 10). It has been determined that multiple SSCs are not provided with complete physical protection from tornado-generated missiles as is required in the licensing basis.

The vulnerable SSCs are being addressed through the Tornado Missile Risk Evaluator (TMRE) methodology (Ref. 2). This methodology demonstrates that a physical lack of tornado missile protection is ultimately acceptable as the associated impact to Core

Damage Frequency (CDF) and Large Early Release Frequency (LERF) is below the stated limits in Regulatory Guide 1.174.

**Summary:** The activity implemented by Design Change NA-20-01042 is the acceptance of non-compliances with the license basis requirement to provide complete protection from tornado-generated missiles for several plant components. The non-compliances have been assessed via Tornado Missile Risk Evaluator methodology (TMRE, Rev. 1 B, as submitted and approved for Shearon Harris in ML 18347 A385) and determined to be acceptable as the acceptance criterion in NEI 17-02 Rev. 1 B and RG 1.17 4 have been satisfied.

A 10 CFR 50.59 evaluation was required as the change involved the usage of a new method of evaluation. Per Dominion Energy procedure CM-AA-400, the usage of a new methodology is considered to be an adverse change requiring a 10 CFR 50.59 evaluation.

In the 10 CFR 50.59 evaluation, only criterion 8 was answered. Per Dominion Energy procedure CM-AA-400 §3.5.3.b, criteria 1-7 are not to be answered if the activity involves a method of evaluation. A review of criterion 8 yielded the following conclusion: Per NEI 96-07, Rev.1, the use of a new NRG-approved methodology (NEI 17-02, Rev. 1 B, as approved for Shearon Harris in ML 18347 A385) is not considered a departure from a method of evaluation as the usage of the methodology is (a) based on sound engineering practice, (b) appropriate for the intended application, and (c) within the limitations of the applicable SER. Per NEI 96-07 §4.3.8 the basis for this determination is documented below:

(a) The methodology usage is based on sound engineering practice - TMRE is proven to be a sound engineering methodology, as evidenced by the NRC's approval of the methodology for Vogtle and Shearon Harris. The TMRE methodology was completely adhered to by North Anna Power Station.

(b) The usage is appropriate for the intended application - TMRE was developed with the express purpose of evaluating nonconformances with a site's licensing basis with regards to protection from tornado-generated missiles. TMRE was applied at North Anna Power Station for that express purpose.

(c) The usage was within the limitations of the applicable SER- the usage of this methodology was consistent with the application approved in ML 18347 A385 by the NRG for Shearon Harris. NEI 17-02 Rev. 1 B was applied as implemented by Shearon Harris, including applicable deviations from NEI 17-02 Rev. 1 B as identified in the NRC's SER (ML 18347 A385). All precautions and limitations identified in the NRC's SER to Shearon Harris will also be satisfied via this Design Change or associated procedural updates.

Therefore, the change is being implemented under 10 CFR 50.59 without the prior submittal of a License Amendment Request.

## **10 CFR 50.59 Evaluation – Document Evaluated:** ETE-NA-2020-1001 Rev. 0

**Brief Description:** It was identified in CR 1132716 that the new Harris hand-held Radios communicate independently from operator action with the base units to re-affiliate (automatic affiliation without operator action). This is done by the radio producing a short full energy transmission. The concern is the effect this transmission might have on sensitive equipment in radio exclusion zones at North Anna as security officers or other personnel pass through the areas. This evaluation will consider the following conditions as outlined in ETE-NA-2020-1001:

Turning Power On/Off - When turning a radio on, it will automatically affiliate with its talk group's control channel. When turning a radio off, it will automatically affiliate to "check out" with its talk group's control channel.

Switching Talk Groups - When a user selects a different talk group, the radio will automatically affiliate with the new control channel.

Scheduled Re-affiliation - The trunked radio system is programmed to poll the portable radios on a scheduled interval if any radio hasn't otherwise re-affiliated within that time frame.

Loss of Control Channel - When a portable radio loses its control channel, it will passively search for its presence. The XG-25P and XG-100P will display "CC Scan". Upon re-acquisition, the radio will re-affiliate with its control channel.

All of these conditions are either fully mitigated by existing administrative controls, by a configuration change made to the Trunked Radio system by ETE-NA-2020-1001 or are otherwise bounded by the electromagnetic characteristics of the Motorola system that was replaced for all portable radios in all frequency bands with one exception. ETE-NA-2020-1001 identifies a loss of control channel function in the 450 MHz band that cannot be fully mitigated and is considered adverse based on the replaced radio system original design. The power level of the new hand-held radios in the 450 MHz range is not bounded by the original North Anna radio testing. All the conditions except a loss of a control channel at 450 MHz screen out as non-adverse. It is noted that Security operators are the only organization that carry radios capable of utilizing the 450 MHz or 150 MHz bands.

**Reason for Change:** The purpose of this Engineering Technical Evaluation (ETE) is to identify a solution to minimize or mitigate potential for the new Harris hand-held radios to transmit independently from operator action with the trunked radio system base units to re-affiliate, while a user is in a radio exclusion zone.

**Summary:** It was identified in CR 1132716 that the new Harris hand-held Radios communicate independently from operator action with the base units to re-affiliate (automatic affiliation without operator action). This is done by the radio producing a short full energy transmission. The concern is the effect this transmission might have on

sensitive equipment in radio exclusion zones at North Anna as security officers or other personnel pass through the areas. ETE-NA-2020-1001 identifies a solution to mitigate potential for the new Harris hand-held radios to transmit independently from operator action with the trunked radio system base units to re-affiliate, while a user is in a radio exclusion zone. It also identifies a loss of control channel function that cannot be fully mitigated and is considered adverse based on the replaced radio system original design.

The potential for a short duration transmission of a portable radio in the exclusion area to acquire a control channel in the 450 MHz range will not prevent or degrade the effectiveness of actions described or assumed in the SAR. It will not alter assumptions previously made in evaluating the radiological consequences of an accident described in the SAR. The 450 MHz band is not used unless there is excessive talk group traffic that exceeds the 800 MHz system's available channels, or a jamming condition occurs rendering the entire 800 MHz frequency band unusable. Data from the system's Site Summary logs indicate there is more than sufficient user capacity such that a switch to 450 MHz does not occur as a result of talk group limitations. In addition, a loss of control channel would have to occur for the radio to automatically transmit for re-acquisition. Loss of control channel is unlikely to occur since testing has shown a strong control channel signal in the exclusion zones. Therefore, multiple simultaneous events must occur for a transmission in the 450 MHz range to occur.

Safety related systems in the plant are designed with train separation to ensure that a single failure in the plant will not prevent the design function of any safety related SSC, even if one train is disabled. In the unlikely event that a portable radio did transmit automatically in the vicinity of a safety related SSC, it would only affect the equipment in its immediate vicinity. The other, unaffected train would still be available to fulfill its design function.

Redundant channels and coincidence logic are used to ensure that no single failure will cause a spurious or prevent a necessary actuation of a protective function. In the unlikely event that a portable radio did transmit automatically in the vicinity of a safety related channel, it would only affect the equipment in its immediate vicinity. Coincidence logic would prevent the affected channel from causing a spurious actuation unless another, unaffected channel happens to be in test at the same moment that the radio transmission occurred. Likewise, if the radio transmission's impact is to prevent a channel from reacting to a legitimate actuation input, the other channels in the circuit would still be available to satisfy the coincidence logic to generate the appropriate SSC actuation.

The sub-components that comprise the SSCs are selected based on rigorous testing standards to ensure their reliability and compatibility with the industrial environment of the plant. Much of the equipment was specifically designed with resilience to electromagnetic phenomena in mind. Construction practices to install the equipment inside the industrial environment of the plant ensure that proper grounding is used and that sensitive components are located within enclosed cabinets or panels. Whether

specifically installed with electromagnetic compatibility in mind or not, these practices also provide a level of protection against the effects of external radio sources. Therefore, in the unlikely event that this transmission did occur, it is highly probable that the re-acquisition transmission would not have an adverse effect on equipment that mitigate radiological consequences in the exclusion zone.

A separate situation is described in ETE-NA-2020-1001 that focuses on the default settings of the new Harris system in which a portable radio operating in the 450 MHz band might automatically transmit on a scheduled interval if a radio user did not cause an affiliation through another means (push to talk, turning the radio on, or changing the talk group channel), while within the boundaries of a radio exclusion zone. The default scheduled re-affiliation interval was 6 hours. This interval was extended to 24 hours by making a configuration change to the trunked radio system on November 12, 2019. By also crediting existing radio user behavior to turn the radios off at the end of each shift, this condition has been fully mitigated and is not considered a credible threat to the functions of safety related SSCs.

**ATTACHMENT 2**

**Commitment Change Evaluation Summary**

**None in 2020.**

**NORTH ANNA POWER STATION UNITS 1 AND 2  
VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION ENERGY VIRGINIA)**