

**NUCLEAR REGULATORY COMMISSION**

**[Docket No. 50-400; NRC-2024-0125]**

**Duke Energy Progress, LLC;**

**Shearon Harris Nuclear Power Plant, Unit 1;**

**Exemption**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Notice; issuance.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) has issued an exemption in response to a February 6, 2024, request, as supplemented by letters dated April 3 and June 7, 2024, from Duke Energy Progress, LLC (the licensee). The exemption relieves the licensee from NRC regulations requiring specific reactor protection system cables at Shearon Harris Nuclear Power Plant, Unit 1, to meet certain requirements of the Electrical and Electronics Engineers (IEEE) Standard 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations."

**DATES:** The exemption was issued on July 26, 2024.

**ADDRESSES:** Please refer to Docket ID **NRC-2024-0125** when contacting the NRC about the availability of information regarding this document. You may obtain publicly available information related to this document using any of the following methods:

- **Federal Rulemaking Website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2024-0125**. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; email: Stacy.Schumann@nrc.gov. For technical questions, contact the individual listed in the "For Further Information Contact" section of this document.

- **NRC's Agencywide Documents Access and Management System**

**(ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, at 301-415-4737, or by email to [PDR.Resource@nrc.gov](mailto:PDR.Resource@nrc.gov). The ADAMS accession number for each document referenced in this document (if that document is available in ADAMS) is provided the first time that it is mentioned in this document.

- **NRC's PDR:** The PDR, where you may examine and order copies of publicly available documents, is open by appointment. To make an appointment to visit the PDR, please send an email to [PDR.Resource@nrc.gov](mailto:PDR.Resource@nrc.gov) or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time (ET), Monday through Friday, except Federal holidays.

- **FOR FURTHER INFORMATION CONTACT:** Michael Mahoney, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; telephone: 301-415-3867; email: [Michael.Mahoney@nrc.gov](mailto:Michael.Mahoney@nrc.gov).

**SUPPLEMENTARY INFORMATION:** The text of the exemption is attached.

Dated: July 29, 2024.

For the Nuclear Regulatory Commission.

*/RA/*

Michael Mahoney, Project Manager,  
Plant Licensing Branch II-2,  
Division of Operating Reactor Licensing,  
Office of Nuclear Reactor Regulation.

**Attachment:** Exemption

**NUCLEAR REGULATORY COMMISSION**

**Docket No. 50-400**

**Duke Energy Progress, LLC**

**Shearon Harris Nuclear Power Plant, Unit 1**

**Exemption**

**I. Background**

Duke Energy Progress, LLC (Duke Energy, the licensee) is the holder of Renewed Facility Operating License No. NPF-63, which authorizes operation of Shearon Harris Nuclear Power Plant, Unit 1 (Harris). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC) now or hereafter in effect. The facility consists of a pressurized-water reactor located in Wake and Chatham Counties, North Carolina.

**II. Request/Action**

By application dated February 6, 2024 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML24037A284), as supplemented by letters dated April 3, 2024 (ML24094A105), and June 7, 2024 (ML24159A746), Duke Energy, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.12, “Specific exemptions,” requested an exemption from a provision in the Institute of Electrical and Electronics Engineers (IEEE) Standard (std) 279-1971, “Criteria for Protection Systems for Nuclear Power Generating Stations,” that is required by CFR 50.55a(h)(2), “Protection systems,” for Harris. Specifically, the exemption request would remove the requirement for the Harris reactor protection system (RPS)

cables that terminate within turbine control system (TCS) Cabinet G (1TCS-CAB-G) to be independent and physically separated in accordance with IEEE 279-1971, Section 4.6, "Channel Independence." The licensee stated that application of the regulation in this circumstance would not serve the underlying purpose of the rule and is not necessary to achieve the underlying purpose of the rule. The exemption request was submitted for review under the NRC's Risk-Informed Process for Evaluations (RIPE).

### **III. Discussion**

The regulations in 10 CFR 50.55a(h)(2) state:

For nuclear power plants with construction permits issued after January 1, 1971, but before May 13, 1999, protection systems must meet the requirements in IEEE Std 279-1968, "Proposed IEEE Criteria for Nuclear Power Plant Protection Systems," or the requirements in IEEE Std 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations," or the requirements in IEEE Std 603-1991, "Criteria for Safety Systems for Nuclear Power Generating Stations," and the correction sheet dated January 30, 1995. For nuclear power plants with construction permits issued before January 1, 1971, protection systems must be consistent with their licensing basis or may meet the requirements of IEEE Std. 603-1991 and the correction sheet dated January 30, 1995.

Duke Energy requested an exemption from IEEE 279-1971, Section 4.6, as required by 10 CFR 50.55a(h)(2), for specific RPS cables at Harris. Contrary to the requirements in IEEE 279-1971, Section 4.6, the safety-related RPS cables that terminate within TCS Cabinet G are not independent and physically separated from the non-safety-related TCS cables. The licensee requested the exemption in order to maintain the current configuration of the TCS circuitry at Harris.

Pursuant to 10 CFR 50.12, the NRC may, upon application by any interested person or upon its own initiative, grant exemptions from requirements of 10 CFR Part 50 when: (1) the exemptions are authorized by law, will not present an undue risk to the

public health and safety, and are consistent with the common defense and security, and (2) special circumstances, as defined in 10 CFR 50.12(a)(2), are present. The licensee states that the special circumstances associated with its exemption request are that the “application of the regulation in this circumstance would not serve the underlying purpose of the rule and is not necessary to achieve the underlying purpose of the rule.”

The exemption request was submitted for review under the RIPE, which is described in the NRC’s “Guidelines for Characterizing the Safety Impact of Issues,” Revision 2 (referenced henceforth as SIC) (ML22088A135). The Office of Nuclear Reactor Regulation (NRR) temporary staff guidance (TSG) document TSG-DORL-2021-01, Revision 3 (ML23122A014), provides the framework and guidance for the staff to implement the streamlined processing of exemption requests from NRC requirements submitted under RIPE. Use of RIPE for exemption requests is limited to issues for which the safety impact can be modeled using probabilistic risk assessment (PRA) and shown to have a minimal safety impact per SIC. RIPE is based on the application of pre-existing risk-informed criteria that allows for the staff’s review and disposition of the submittal to be streamlined and efficient.

As described in the SIC, all the following must apply in order to characterize an issue as having a minimal safety impact and qualify for consideration under the RIPE:

- The issue contributes less than  $1 \times 10^{-7}$ /year to core damage frequency (CDF);
- The issue contributes less than  $1 \times 10^{-8}$ /year to large early release frequency (LERF);

- The issue has no safety impact or minimal safety impact in accordance with the SIC; and
- Cumulative risk is assessed based on plant-specific CDF and LERF.

Cumulative risk is acceptable for the purposes of this guidance if baseline risk remains less than  $1 \times 10^{-4}$ /year for CDF and less than  $1 \times 10^{-5}$ /year for LERF once the impact of the proposed change is incorporated into baseline risk.

RIPE exemption requests must also include defense-in-depth (DID) and safety margin considerations assessed by the integrated decision-making panel (IDP).

Requests for changes made under the RIPE are reviewed by the NRC staff in a manner consistent with the principles of risk-informed decision-making outlined in Regulatory Guide 1.174, Revision 3, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (ML17317A256), which includes ensuring that the proposed change is consistent with DID philosophy, maintains sufficient safety margins, is consistent with the Commission's Safety Goal Policy Statement, and includes performance monitoring strategies.

#### Conformance with the RIPE Minimal Safety Impact Criteria

The licensee considered the RIPE screening questions contained in the SIC and concluded that the requested exemption would not have a more than minimal impact on safety. Considerations for each of the five screening questions are discussed below.

1. Does the issue result in an adverse impact on the frequency of occurrence of an accident initiator or result in a new accident initiator?

In Section 4.4 of the exemption request, the licensee states that the issue does not result in an adverse impact on the frequency of occurrence of an accident initiator or result in a new accident initiator because the cables impacted by the issue are associated with the solid state protection system (SSPS), which provides the logic to

develop reactor trip and emergency safety feature actuation signals (ESFAS). The licensee also states that the SSPS provides a mitigation function and does not initiate an accident or create a new accident initiator.

The NRC staff reviewed the licensee's consideration of this screening element and concluded that the issue does not adversely impact the frequency of occurrence of an accident initiator or result in a new accident initiator because the SSPS provides a mitigation function and does not initiate an accident.

2. Does the issue result in an adverse impact on the availability, reliability, or capability of structures, systems, or components (SSCs) or personnel relied upon to mitigate a transient, accident, or natural hazard?

In Section 4.4 of the exemption request, the licensee states that the issue does not result in an adverse impact on the availability, reliability, or capability of SSCs or personnel relied upon to mitigate a transient, accident, or natural hazard because the safety-related protection trains will remain fully capable of performing their intended functions. The licensee's conclusion is based on an evaluation that reviewed potential sources of electrical anomalies and the mitigation techniques used to reduce the probability of an event occurring that could impact plant equipment. The electrical anomaly evaluation is described in Section 4.1 of the exemption request and included evaluation of the cabinet design, cabinet location, electrical grounding, power source design, signal attenuation due to cable length, equipment qualification, cable routing, previous testing of low-level instrument wiring, plant operating experience, and the requirements in IEEE 384-1974, "IEEE Trial-Use Standard Criteria for Separation of Class 1E Equipment and Circuits." The evaluation concludes that there are no credible electrical anomaly events which could impact either train of safety-related equipment from performing its design basis function.

The license stated that the turbine trip logic connects to the SSPS and RPS through four control relays that use redundant contacts from the reactor trip breaker. In addition, the licensee stated the reactor trip breaker auxiliary contacts provide indication of a reactor trip to the turbine trip system (TTS) and that an open or short of the contacts used for the non-safety related portion of the circuit would not prevent a reactor trip from occurring, if required, because the auxiliary contacts are not in the direct electrical path of the reactor trip breakers. The cables and conduits for each of these circuits follow the separation criteria requirements except for Terminal Box B and TCS Cabinet G. The isolation between the TCS and the RPS/SSPS trains is provided in the RPS and SSPS cabinets.

In the exemption request, the licensee stated that if a short circuit were to occur, the impact would be limited to a single train of the TTS and that multiple shorts would be needed to impact both TTS trains. In its supplement dated June 7, 2024, the licensee stated:

A fault of the TTS cables could impact the non-safety-related automatic turbine trip on reactor trip function. For example, a fault could cause a short circuit which could bypass the SSPS turbine trip output relay contacts, thus preventing the turbine from tripping. If this were to occur and a reactor trip occurred, Operations would trip the turbine manually by the Main Control Board turbine trip switch per step 2 of [Harris] Emergency Operating Procedure EOP-E-0, "REACTOR TRIP OR SAFETY INJECTION."

Under 10 CFR 50.62(c)(1), each pressurized-water reactor must have equipment, from sensor output to final actuation device, that is diverse from the reactor trip system, to automatically initiate the auxiliary feedwater system and initiate a turbine trip under conditions indicative of an anticipated transient without scram (ATWS). Harris complied with this requirement by installing ATWS mitigation system actuation circuitry (AMSAC). The NRC staff notes that AMSAC would remain available to trip the turbine if an ATWS were to occur.



The NRC staff reviewed the licensee's consideration of this screening element and determined that an adverse impact to the availability, reliability, or capability of SSCs relied upon to mitigate a transient, accident, or natural hazard exists because the separation and channel independence requirements of IEEE 279-1971 are not met in TCS Cabinet G. However, the licensee's evaluation of the TCS circuitry demonstrates that, while the exemption would rely on non-safety-related equipment to prevent potential electrical anomalies from propagating to safety-related components, the TCS design is robust and configured such that any electrical perturbations are unlikely. Should an electrical short condition result in failure of an automatic turbine trip, pre-existing procedurally directed operator actions are available to manually initiate the required turbine trip.

The NRC staff concluded that the adverse impact of not meeting the separation and channel independence requirements of IEEE 279-1971, Section 4.6, for the RPS cables that terminate within TCS Cabinet G on the availability, reliability, or capability of SSCs or personnel relied upon to mitigate a transient, accident, or natural hazard is not more than minimal because (1) the design of the TCS ensures it is unlikely that an electrical anomaly event could occur that would prevent either train of safety-related equipment from performing its design basis function, (2) not meeting separation and channel independence requirements would not impact the reactor trip breakers because the turbine trip logic is not directly electrically connected the reactor trip breakers, and (3) operator actions and AMSAC would remain available to trip the turbine in the unlikely event that a fault prevented the turbine trip from occurring automatically.

3. Does the issue result in an adverse impact on the consequences of an accident sequence?

In Section 4.4 of the exemption request, the licensee stated that the issue does not affect the safety-related design functions of the SSPS or RPS. The licensee also

states the design function of the SSPS to mitigate an accident is not impacted and therefore the consequences of any accident previously evaluated are not impacted. In its supplement dated June 7, 2024, the licensee stated that a fault of the TTS cables could impact the non-safety-related automatic turbine trip on reactor trip function, but procedurally directed operator actions would remain available to manually trip the turbine if needed.

The NRC staff reviewed the licensee's consideration of this screening element and concluded that the proposed exemption does not result in an adverse impact on the consequences of an accident because the proposed exemption does not prevent the ability of the safety-related systems to perform their design functions.

4. Does the issue result in an adverse impact on the capability of a fission product barrier?

In Section 4.4 of the exemption request, the licensee stated that the issue does not affect operating limits, the fuel, reactor coolant system (RCS), or modify the containment boundary in any way. The cables are located outside the containment building and do not result in revising or challenging a design basis limit for a fission product barrier (i.e., numerical limiting value for controlling the integrity of the fuel cladding, reactor coolant pressure boundary, and/or containment) as described in the Updated Final Safety Analysis Report. Furthermore, the licensee stated the proposed exemption does not prevent the ability of the safety-related systems to perform their design functions.

The NRC staff reviewed the licensee's consideration of this screening element and concluded that the proposed exemption does not result in an adverse impact on the capability of a fission product barrier because the proposed exemption does not prevent the ability of safety-related systems, including RCS and containment, to perform their design functions or alter any design-basis limits.

5. Does the issue result in an adverse impact on DID capability or impact in safety margin?

In Section 4.4. of the exemption request, the licensee stated that there is no adverse impact on DID and safety margins because there are no credible events that would prevent both trains of safety-related equipment from fulfilling their design-basis functions. The licensee's conclusion is based on an evaluation of the potential for electrical anomalies described in Section 4.1 of the exemption request, which included evaluation of the cabinet design, cabinet location, electrical grounding, power source design, signal attenuation due to cable length, equipment qualification, cable routing, previous testing of low-level instrument wiring, plant operating experience, and the requirements in IEEE 384-1974. The evaluation concluded that there are no credible electrical anomaly events which could impact either train of safety-related equipment from performing its design-basis function.

The licensee stated that, based on the evaluation that established there are no credible events that would impact both trains of safety-related equipment from performing its design-basis function, the key aspects of IEEE 279-1971 for single failure criterion and channel integrity are maintained. The licensee also stated that while the common connection for the "A" and "B" trains in the TCS does challenge the channel independence requirement of IEEE 279-1971, Section 4.6, there is not a credible reduction in the ability of the safety-related systems to perform their intended design functions. The licensee further stated that exemption to the IEEE 279-1971, Section 4.6, requirement will not impact the ability of the safety-related protection trains to remain fully capable of performing their intended design functions in generating the signals associated with actuating reactor trip and engineered safeguards, as required by IEEE 279-1971.

In its response to screening question 2, the licensee stated that the turbine trip logic connects to the SSPS and RPS through four control relays that use redundant contacts from the reactor trip breaker and that an open or short of the contacts used for the non-safety related portion of the circuit would not prevent a reactor trip from occurring, if required, because the auxiliary contacts are not in the direct electrical path of the reactor trip breakers. The licensee also stated that the isolation between the TCS and the RPS/SSPS trains is provided in the RPS and SSPS cabinets. Further, the licensee stated that if a short circuit were to occur, the impact would be limited to a single train and the ability to trip the turbine would not be lost. In its supplement dated June 7, 2024, the licensee stated that a fault of the TTS cables could impact the non-safety-related automatic turbine trip on reactor trip function, but procedurally directed operator actions would remain available to manually trip the turbine if needed. In addition, the NRC staff notes that AMSAC would remain available to trip the turbine if an ATWS were to occur, such as due to multiple shorts occurring (which is outside of the single failure proof design criteria).

The NRC staff reviewed the licensee's consideration of this screening element and determined that the licensee describes a potential adverse impact to DID and safety margins because the channel independence requirements of IEEE 279-1971 are not met in TCS Cabinet G. However, the licensee's evaluation of the TCS circuitry demonstrates that, while the exemption would rely on non-safety-related equipment to prevent potential electrical anomalies from propagating to safety-related components, the TCS design is robust and configured such that any electrical perturbations are unlikely. In the unlikely event that an electrical condition results in failure of an automatic turbine trip, procedurally directed operator actions are available to manually trip the turbine. The use

of pre-existing procedurally controlled operator actions to provide diversity and DID for this unlikely scenario does not result in the over-reliance on programmatic measures.

The NRC staff concluded that the adverse impact of not meeting the separation and channel independence requirements of IEEE 279-1971, Section 4.6, for the RPS cables that terminate within TCS Cabinet G on DID capability and safety margins is not more than minimal because (1) the design of the TCS ensures it is unlikely that an electrical anomaly event could occur that would prevent either train of safety-related equipment from performing its design-basis functions, (2) not meeting channel independence requirements would not impact the reactor trip breakers because the turbine trip logic is not directly electrically connected the reactor trip breakers, and (3) operator actions and AMSAC would remain available to trip the turbine in the unlikely event that a fault prevented the turbine trip from occurring automatically.

#### Implementation of an IDP

The licensee has been approved to adopt 10 CFR 50.69, "Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors," by license amendment No. 174, issued September 17, 2019 (ML19192A012), as revised by license amendment No. 188, issued January 19, 2022 (ML21316A248). The licensee established a multi-disciplinary IDP to evaluate the proposed exemption request. The IDP membership included personnel from site engineering, operations, PRA, safety analysis, and licensing. Therefore, the NRC staff concludes that Harris used an acceptable IDP in support of the proposed exemption request per the RIPE guidance in TSG-DORL-2021-01.

#### Use of an Acceptable/Approved PRA Model

Harris has adopted risk-informed initiative Technical Specifications Task Force (TSTF) traveler TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion

Times – RITSTF Initiative 4b,” for the risk-informed completion time program, as approved by license amendment No. 184, issued April 2, 2021 (ML21047A314). The Harris PRA model used to support the risk-informed completion time license amendment includes internal events, internal flooding, and fire hazards. The Harris PRA model does not include high winds, external flooding, or seismic hazards due to meeting screening criteria as part of the approval of its risk-informed completion time license amendment. There are no concerns in this exemption request specifically related to high winds, external flooding, or seismic hazards. Implementation of the TSTF-505 license amendment and associated license conditions have been completed. Therefore, the NRC staff concludes that Harris used a technically acceptable PRA model in support of the proposed exemption request per the RIPE guidance in the SIC.

#### Evaluation of PRA Results

The licensee quantitatively assessed the risk significance of maintaining the current TCS circuitry at Harris with the proposed exemption using a surrogate to represent the potential for a hot short to fail the ability of (1) the turbine to trip upon a reactor trip, (2) the reactor to trip upon a valid RPS signal, and (3) the ESFAS to actuate upon a valid actuation. The surrogate basic event was applied in the logic model where turbine trips, RPS signal failures, and ESFAS actuations were modeled. The surrogate basic event probability was based on the conditional probability of a hot short to occur during a conservative selection of fires that impact either train of SSPS. The risk results were  $1.6 \times 10^{-8}$ /year for CDF and less than  $1 \times 10^{-10}$ /year for LERF. These results satisfy the RIPE criteria of contributing less than  $1 \times 10^{-7}$ /year to CDF and  $1 \times 10^{-8}$ /year to LERF. Cumulative risk results were  $4.1 \times 10^{-5}$ /year for CDF and  $3.5 \times 10^{-6}$ /year for LERF. Therefore, cumulative risk for Harris remains less than the RIPE criteria of  $1 \times 10^{-4}$ /year for CDF and  $1 \times 10^{-5}$ /year for LERF. The NRC staff concludes that these

results satisfy the RIPE criteria for a minimal increase in risk for the proposed exemption.

#### Evaluation of the Need for Risk Management Actions

Evaluation of the RIPE screening questions and the PRA results confirm that the proposed exemption results in a minimal safety impact. For these results, the SIC guidance states that risk management actions must be considered to offset the risk increase for the NRC staff to review under RIPE. Section 4.3 of the exemption request states that a review of industry operating experience related to the issue did not identify any specific modifications necessary to assess and/or bound the impact of the issue on quantitative risk. Therefore, the NRC staff concluded that no risk management actions were identified or required.

#### Assessment of Performance Monitoring Strategies

Section 4.1 of the exemption request states that the TSC was upgraded in 2018 but the cables in question have not been moved since original plant construction. Both the previous and current designs energize the control circuits continuously so that a loss of power would result in a turbine trip. The previous design tested the circuit quarterly. The current design cycles the control relays weekly, and this test has been performed once a week for over 5 years. There have been no instances of spurious control circuit anomalies attributed to the TCS trip relays cycling on and off.

The NRC staff concluded that the existing performance monitoring strategies will ensure no deficiencies exist that would challenge the conclusions in the licensee's evaluation of the proposed exemption.

#### **A. The Exemption is Authorized by Law**

The NRC has the authority under 10 CFR 50.12 to grant exemptions from the requirements of Part 50 upon demonstration of proper justification. The licensee has

requested an exemption to the requirement in 10 CFR 50.55a(h)(2) requiring protection systems meet the requirements of IEEE 279-1971, Section 4.6, for safety-related RPS cables that terminate within TCS Cabinet G. As discussed below, the NRC staff determined that special circumstances exist, which support granting the proposed exemption. Furthermore, granting the exemption would not result in a violation of the Atomic Energy Act of 1954, as amended, or the NRC's regulations. Therefore, the exemption is authorized by law.

**B. The Exemption Presents no Undue Risk to Public Health and Safety**

The NRC staff has concluded that the exemption represents low risk, is of minimal safety impact, and that adequate DID and safety margins are preserved. The NRC staff concluded that the licensee's submittal demonstrates that the design of the TCS is robust against electrical failures that would prevent the RPS from performing their intended functions with the proposed exemption. Thus, granting this exemption request will not pose undue risk to public health and safety.

**C. The Exemption is Consistent with the Common Defense and Security**

The NRC staff has evaluated the licensee's exemption request and concluded that the licensee's submittal demonstrates that the design of the TCS is robust against electrical failures that would prevent the RPS from performing their intended functions with the proposed exemption. The NRC staff also concluded that adequate DID and safety margins will be preserved with the requested exemption. Further, the exemption does not involve security requirements and does not create a security risk. Therefore, the exemption is consistent with the common defense and security.

**D. Special Circumstances**

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the circumstances would not serve the purpose



of the rule or is not necessary to achieve the purpose of the rule. The licensee has requested a limited scope exemption from 10 CFR 50.55a(h)(2) that would only apply to the RPS cables that terminate within TCS Cabinet G. Specifically, the exemption request would remove the requirement for the RPS cables that terminate within TCS Cabinet G to be independent and physically separated in accordance with IEEE 279-1971, Section 4.6. The underlying purpose of IEEE 279-1971, Section 4.6, is to ensure the capability of the safety-related system to accomplish its safety function during normal and accident conditions and reduce the likelihood of interactions between channels during maintenance operations or in the event of a channel malfunction.

The licensee has supported that the design of the TCS is adequate to ensure that the lack of independence and physical separation between TCS and RPS cables in TCS Cabinet G is unlikely to prevent either system from being able to perform their intended functions. In addition, the licensee has also demonstrated that adequate DID and safety margins will be preserved with the requested exemption. For these reasons, the NRC staff finds that for this limited scope exemption to the requirements of 10 CFR 50.55a(h)(2) for the safety-related RPS cables that terminate within TCS Cabinet G, application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule.

#### **E. Environmental Considerations**

The exemption requested by the licensee includes changes to requirements with respect to installation or use of a facility component located within the restricted area. The NRC staff determined that the exemption meets the eligibility criteria for the categorical exclusion set forth in 10 CFR 51.22(c)(9) because the granting of this exemption involves: (i) no significant hazards consideration, (ii) no significant change in the types or a significant increase in the amounts of any effluents that may be released

offsite, and (iii) no significant increase in individual or cumulative occupational radiation exposure. Therefore, in accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the NRC's consideration of this exemption request. The basis for the NRC staff's determination of each of the requirements in 10 CFR 51.22(c)(9) is discussed below.

Requirements in 10 CFR 51.22(c)(9)(i)

The NRC staff evaluated the issue of no significant hazards consideration using the standards described in 10 CFR 50.92(c), as presented below:

1. Does the proposed exemption involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The design of the TCS is robust against electrical failures that would prevent the RPS from performing their intended functions with the proposed exemption and does not modify how the plant is operated. The proposed exemption does not affect any plant protective boundaries, cause a release of fission products to the public, or alter the performance of any SSCs important to safety.

Therefore, the proposed exemption does not result in a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed exemption create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The design of the TCS is robust against electrical failures that would prevent the RPS from performing their intended functions with the proposed exemption and does not modify how the plant is operated. In addition, the TTS and RPS provide mitigation functions and do not initiate accidents or create a new accident initiators.

Therefore, the proposed exemption does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed exemption involve a significant reduction in a margin of safety?

Response: No.

The design of the TCS is robust against electrical failures that would prevent the RPS from performing their intended functions with the proposed exemption and does not modify how the plant is operated. The proposed exemption does not alter any setpoints for protective actions, change the initial conditions for any accidents, or alter the requirements of any SSCs important to safety.

Therefore, the proposed exemption does not involve a significant reduction in a margin of safety.

The NRC staff concludes that the proposed exemption presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of no significant hazards consideration is justified (i.e., satisfies the provision of 10 CFR 51.22(c)(9)(i)).

Requirements in 10 CFR 51.22(c)(9)(ii)

The design of the TCS is robust against electrical failures that would prevent the RPS from performing their intended functions with the proposed exemption and does not modify how the plant is operated. The proposed exemption does not alter any setpoints for protective actions, change the initial conditions for any accidents, or alter the requirements of any SSCs important to safety. The proposed exemption will not significantly change the types or amounts of effluents that may be released offsite. Therefore, the staff finds that the provision of 10 CFR 51.22(c)(9)(ii) is satisfied.

Requirements in 10 CFR 51.22(c)(9)(iii)

The licensee's request supported that the exemption had either no or a minimal safety impact for all accident initiator categories and the NRC staff has concluded that the proposed exemption will not result in an adverse impact on the frequency of existing accident initiators or result in new accident initiators. The proposed exemption will not significantly increase individual occupational radiation exposure, or significantly increase cumulative public or occupational radiation exposure. Therefore, the staff finds that the provision of 10 CFR 51.22(c)(9)(iii) is satisfied.

The NRC staff concludes that the proposed exemption meets the eligibility criteria for the categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, in accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the NRC's proposed granting of this exemption.

**IV. Conclusions**

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, the exemption is authorized by law, will not present an undue risk to the public health

and safety, and is consistent with the common defense and security. Also, special circumstances are present. Therefore, the Commission hereby grants Duke Energy an exemption from IEEE 279-1971, Section 4.6, as required by 10 CFR 50.55a(h)(2), for the safety-related RPS cables at Harris that terminate within TCS Cabinet G.

Dated: July 26, 2024

For the Nuclear Regulatory Commission.

*/RA/*

Aida Rivera-Varona, Deputy Director,  
Division of Operating Reactor Licensing,  
Office of Nuclear Reactor Regulation.