UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

March 25, 2022

Edward Pigott
Site Vice President
Duke Energy Carolinas, LLC
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: WILLIAM B. MCGUIRE NUCLEAR STATION – NRC EXAMINATION REPORT 05000369/2022301 AND 05000370/2022301

Dear Mr. Pigott:

During the period February 14-17, 2022, the Nuclear Regulatory Commission (NRC) administered operating tests to employees of your company who had applied for licenses to operate the William B. McGuire Nuclear Station. At the conclusion of the tests, the examiners discussed preliminary findings related to the operating tests and the written examination submittal with those members of your staff identified in the enclosed report. The written examination was administered by your staff on February 24, 2022.

Four Reactor Operator (RO) and four Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. There were three post-administration comments concerning the operating examination. The comments and the NRC resolution of those comments are summarized in Enclosure 2. A Simulator Fidelity Report is included in this report as Enclosure 3.

The initial examination submittal was within the range of acceptability expected for a proposed examination. All examination changes agreed upon between the NRC and your staff were made according to NUREG-1021, “Operator Licensing Examination Standards for Power Reactors,” Revision 11.

In accordance with 10 CFR 2.390 of the NRC’s “Rules of Practice,” a copy of this letter and its enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC’s document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm.adams.html (the Public Electronic Reading Room).

If you have any questions concerning this letter, please contact me at (404) 997-4551.

Sincerely,

/RA/

Gerald J. McCoy, Chief
Operations Branch 1
Division of Reactor Safety

Docket Nos: 50-369 and 50-370
License Nos: NPF-9 and NPF-17

Enclosures:
1. Report Details
2. Facility Comments and NRC Resolution
3. Simulator Fidelity Report

cc: Distribution via Listserv

SUBJECT: WILLIAM B. MCGUIRE NUCLEAR STATION – NRC EXAMINATION REPORT 05000369/2022301 AND 05000370/2022301 dated March 25, 2022

**DISTRIBUTION:**
M. Bates, RII
G. McCoy, RII

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ADAMS: ☒ Yes ACCESSION NUMBER: ML22087A478 ☐ SUNSI REVIEW COMPLETE ☐ FORM 665 ATTACHED

| OFFICE | RII/ DRS/OB | RII:DRS/OB | RII:DRS/OB | | | |
|---|---|---|---|---|---|---|
| NAME | DEgelstad | MBATES | GMCCOY | | | |
| DATE | 3/11/2022 | 3/ 24 /2022 | 3/ 25 /2022 | | | |

OFFICIAL RECORD COPY DOCUMENT NAME:
HTTPS://USNRC.SHAREPOINT.COM/TEAMS/RIIOPERATORLICENSINGEXAMS/MCGUIRE/INITIAL EXAM 2022-301/2022-301 INITIAL/CORRESPONDENCE/MCGUIRE 2022-301 EXAM REPORT.DOCX

**U.S. NUCLEAR REGULATORY COMMISSION**

REGION II

| | |
|---|---|
| Docket No.: | 05000369, 05000370 |
| License No.: | NPF-9, NPF-17 |
| EPID No.: | L-2022-OLL-0012 |
| Report No.: | 05000369/2022301 and 05000370/2022301 |
| Licensee: | Duke Energy Carolinas, LLC |
| Facility: | McGuire Nuclear Station, Units 1 & 2 |
| Location: | Huntersville, NC 28078-8985 |
| Dates: | Operating Test – February 14 – 17, 2022<br>Written Examination – February 24, 2022 |
| Examiners: | Mark Bates, Chief Examiner, Senior Operations Engineer<br>Jason Bundy, Senior Operations Engineer<br>Gary Callaway, Senior Technology Instructor<br>Kevin Kirchbaum, Operations Engineer |
| Approved by: | Gerald J. McCoy, Chief<br>Operations Branch 1<br>Division of Reactor Safety |

## SUMMARY

ER 05000369/2022301 and 05000370/2022301; operating test February 14-17, 2022 & written exam February 24, 2022; William B. McGuire Nuclear Station; Units 1 and 2 Operator License Examinations.

Nuclear Regulatory Commission (NRC) examiners conducted an initial examination in accordance with the guidelines in Revision 11, of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." This examination implemented the operator licensing requirements identified in 10 CFR §55.41, §55.43, and §55.45, as applicable.

Members of the McGuire Nuclear Station staff developed both the operating tests and the written examination. The initial operating test, written Reactor Operator (RO) examination, and written Senior Reactor Operator (SRO) examination submittals met the quality guidelines contained in NUREG-1021.

The NRC administered the operating tests during the period February 14-17, 2022. Members of the McGuire Nuclear Station training staff administered the written examination on February 24, 2022. Four RO and four SRO applicants passed both the operating test and written examination. All eight applicants were issued licenses commensurate with the level of examination administered.

There were three post-examination comments.

No findings were identified.

## REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Operator Licensing Examinations

a. Inspection Scope

The NRC evaluated the submitted operating test by combining the scenario events and JPMs in order to determine the percentage of submitted test items that required replacement or significant modification. The NRC also evaluated the submitted written examination questions (Reactor Operator and Senior Reactor Operator questions considered separately) in order to determine the percentage of submitted questions that required replacement or significant modification, or that clearly did not conform with the intent of the approved knowledge and ability (K/A) statement. Any questions that were deleted during the grading process, or for which the answer key had to be changed, were also included in the count of unacceptable questions. The percentage of submitted test items that were unacceptable was compared to the acceptance criteria of NUREG-1021, "Operator Licensing Standards for Power Reactors."

The NRC reviewed the licensee's examination security measures while preparing and administering the examinations in order to ensure compliance with 10 CFR §55.49, "Integrity of examinations and tests."

The NRC administered the operating tests during the period February 14-17, 2022. The NRC examiners evaluated four Reactor Operator (RO) and four Senior Reactor Operator (SRO) applicants using the guidelines contained in NUREG-1021. Members of the McGuire Nuclear Station training staff administered the written examination on February 24, 2022. Evaluations of applicants and reviews of associated documentation were performed to determine if the applicants, who applied for licenses to operate the McGuire Nuclear Station, met the requirements specified in 10 CFR Part 55, "Operators' Licenses."

The NRC evaluated the performance or fidelity of the simulation facility during the preparation and conduct of the operating tests.

b. Findings

No findings were identified.

The NRC developed the written examination sample plan outline. Members of the McGuire Nuclear Station training staff developed both the operating tests and the written examination. All examination material was developed in accordance with the guidelines contained in Revision 11 of NUREG-1021. The NRC examination team reviewed the proposed examination. Examination changes agreed upon between the NRC and the licensee were made per NUREG-1021 and incorporated into the final version of the examination materials.

Using NUREG-1021, the NRC determined that the licensee's initial examination submittal was within the range of acceptability expected for a proposed examination.

All four RO applicants and four SRO applicants passed both the operating test and written examination. All applicants were issued licenses.

Copies of all individual examination reports were sent to the facility Training Manager for evaluation of weaknesses and determination of appropriate remedial training.

The licensee submitted three post-examination comments concerning the operating examination. A copy of the final written examination and answer key may be accessed not earlier than April 3, 2024, in the ADAMS system (ADAMS Accession Numbers ML22070A820 and ML22070A893). A copy of the post examination comments may be accessed immediately, in the ADAMS system (ADAMS Accession Number ML22070B051).

4OA6 Meetings, Including Exit

Exit Meeting Summary

On February 17, 2022 the NRC examination team discussed generic issues associated with the operating test with Ed Pigott, Site Vice-President, and members of the McGuire Nuclear Station staff. The examiners asked the licensee if any of the examination material was proprietary, or if any of the examination material received should be withheld from public disclosure. No proprietary information was identified. No information was identified that required withholding from public disclosure.

On March 23, 2022, the Chief Examiner discussed final examination results with Training Management.

## KEY POINTS OF CONTACT

Licensee personnel

| | |
|---|---|
| E. Pigott | Site Vice-President |
| B. Bare | Station Manager |
| M. Matheny | Operations Manager |
| R. Severns | Assistance Operations Manager - Shift |
| S. Moser | Training Manager |
| C. Vrikkis | Superintendent – Nuclear Operations Training |
| W. Killette | Superintendent - Nuclear Operations Training |
| J. Thomas | Regulatory Affairs Manager |
| C. Bush | ILT Lead Instructor – Nuclear Operations Training |
| S. Gibson | NRC Exam Author – Operations Nuclear Training |
| C. Ceva | Manager – Nuclear Support Services |

NRC personnel

| | |
|---|---|
| A. Hutto | Senior Resident Inspector |

## FACILITY POST-EXAMINATION COMMENTS AND NRC RESOLUTIONS

A complete text of the licensee's post-examination comment can be found in ADAMS under Accession Number ML22070B051.

**Item 1**

Admin JPM A1a SRO (SGTL Action Levels)

Facility Comment

During administration of SRO JPM A1a, a S/G Tube Leak on 1D S/G was given that reached 138.0 GPD. The original submittal identified Tech Spec 3.4.13 (RCS Operational Leakage) condition 'B', required actions B1 and B2, as being the applicable Tech Specs for this condition. It has since been determined that Tech Spec 3.4.18 (SG Tube Integrity) Condition 'B' is also applicable for this particular condition in the JPM.

> *The following information is from the Tech Spec 3.4.18 Bases:*
>
> *"A SG tube has tube integrity when it satisfies the SG performance criteria. The SG performance criteria are defined in Specification 5.5.9, "Steam Generator (SG) Program," and describe acceptable SG tube performance. The Steam Generator Program also provides the evaluation process for determining conformance with the SG performance criteria.*
>
> *There are three SG performance criteria: structural integrity, accident induced leakage, and operational LEAKAGE. Failure to meet any one of these criteria is considered failure to meet the LCO."*

Based on the fact that the operational LEAKAGE for this JPM exceeded the limit of 135 Gallons Per Day identified in Tech Spec 3.4.13, Tech Spec 3.4.18 LCO is also not met, and Condition 'B' is applicable.

Facility Proposed Resolution:

Request that JPM A1a SRO be updated to include required application of T.S. 3.4.18 Condition B following the 1B S/G Tube Leak.

NRC Resolution

The licensee's recommendation was accepted.

**Item 2**

Admin JPM A1a RO (Manual AFD Calculation):

Facility Comment

The Task Standard for Admin JPM A1a RO is as follows:
AFD is determined to be within (±) 0.02% of the following values:

PR-41 = -24.80
PR-42 = -16.10%
PR-43 = -25.97%
PR-44 = -17.99%
The operator determines the AFD associated with N41 and N43 exceeds the COLR limit of (-21.60%) at 90% RTP and informs the CRS.

The allowed band was determined based on rounding all calculations to two decimal places.
Applicants performed the calculation correctly. However, the applicants rounded to various significant digits which resulted in answers that were not within the allowed band of the Task Standard (±) 0.02.

Facility Proposed Resolution:

The facility endorsed position is that the applicants performed the calculations correctly and a new allowed band should be added to the Task Standard. Request that JPM A1a RO Task Standard be updated to include the new allowed band listed below for each individual detector.

PR-41 = -24.80% **(-23.9 to -25.2)**
PR-42 = -16.10% **(-14.5 to -16.4)**
PR-43 = -25.97% **(-24.9 to -29.9)**
PR-44 = -17.99% **(-17.1 to -19.6)**

NRC Resolution

The licensee's recommendation was accepted.

The calculations on the next two pages were used to confirm the licensee recommended bands.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| PR=41A | 108.5 | 315 | 290.32 | | | |
| | | | 290 to 291 | | | |
| PR-41B | 118.3 | 390 | 329.67 | | | |
| | | | 329 to 330 | | | |
| Straight Calc (SC) | | | | -19.68 | 1.260 | -24.80 |
| Min Calc (Min) | | | | -20.0 | 1.260 | -25.2 |
| Max Calc (Max) | | | | -19.0 | 1.260 | -23.9 |
| Acceptance Band | | | | | | **-25.2 to -23.9** |
| | | | | | | |

$C_{SC}$ = (B/A)100 = 290.32 acceptance band = 290 to 291
$D_{SC}$ = 290.32 – 329.67 = -19.68
$D_{Min}$ = (290 – 330) / 2 = -20.0
$D_{Max}$ = (291 – 329) / 2 = -19.0
$F_{SC}$ = (-19.68)(1.260) = -24.80
$F_{Min}$ = (-20.0)((1.260) = -25.2
$F_{Max}$ = (-19.0)(1.260) = -23.9

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| PR=42A | 107.3 | 321 | 299.16 | | | |
| | | | 299 to 300 | | | |
| PR-42B | 114.6 | 372 | 324.61 | | | |
| | | | 323 to 325 | | | |
| Straight Calc (SC) | | | | -12.73 | 1.265 | -16.1 |
| Min Calc (Min) | | | | -13.0 | 1.265 | -16.4 |
| Max Calc (Max) | | | | -11.5 | 1.265 | -14.5 |
| Acceptance Band | | | | | | **-16.4 to -14.5** |
| | | | | | | |

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| PR=43A | 91.7 | 302 | 329.33 | | | |
| | | | 329 to 330 | | | |
| PR-43B | 104.1 | 384 | 368.88 | | | |
| | | | 368 to 370 | | | |
| Straight Calc (SC) | | | | -19.78 | 1.313 | -25.97 |
| Min Calc (Min) | | | | -20.5 | 1.313 | -29.9 |
| Max Calc (Max) | | | | -19.0 | 1.313 | -24.9 |
| Acceptance Band | | | | | | **-29.9 to -24.9** |
| | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | F |
| PR=41A | 108.3 | 316 | 291.78 | | | |
| | | | 291 to 293 | | | |
| PR-41B | 122.4 | 392 | 320.26 | | | |
| | | | 320 to 322 | | | |
| Straight Calc(SC) | | | | -14.24 | 1.263 | -17.99 |
| Min Calc (Min) | | | | -15.5 | 1.263 | -19.6 |
| Max Calc (Max) | | | | -13.5 | 1.263 | -17.1 |
| Acceptance Band | | | | | | **-19.6 to -17.1** |
| | | | | | | |

**Item 3**

Scenario N22-1-1, Event 7 PZR PORV 1NC-34 fails OPEN and Block valve fails OPEN

Facility Comment

The original submittal identified Tech Spec 3.4.11 (PZR PORVS) condition ‘C’, required actions C.1, C.2 and C.3 and condition ‘H’, required actions H.1, H.2 and H.3 as being the applicable Tech Specs for this failure.

Due to the failure resulting in a small break LOCA, it has since been determined that Tech Spec 3.4.13 (RCS OPERATIONAL LEAKAGE) condition ‘B’, required actions B.1 and B.2 and SLC 16.9.7 (STANDBY SHUTDOWN SYSTEM) condition ‘C’, required actions C.1 and C.2 are applicable for this particular event.

Facility Proposed Resolution:

Request the applicable ES-D-2 be updated to reflect that entry into Tech Spec 3.4.13 (RCS OPERATIONAL LEAKAGE) and SLC 16.9.7 (STANDBY SHUTDOWN SYSTEM) are required.

NRC Resolution

The licensee’s recommendation was accepted.

**SIMULATOR FIDELITY REPORT**

Facility Licensee: McGuire Nuclear Station

Facility Docket No.: 05000369 and 05000370

Operating Test Administered: February 14-17, 2022.

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and, without further verification and review in accordance with Inspection Procedure 71111.11 are not indicative of noncompliance with 10 CFR 55.46. No licensee action is required in response to these observations.

No simulator fidelity or configuration issues were identified.