



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

April 24, 2020

Mr. Thomas D. Ray
Duke Energy Carolinas, LLC
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: WILLIAM B. MCGUIRE NUCLEAR STATION – NRC EXAMINATION REPORT
05000369/2020301 AND 05000370/2020301

Dear Mr. Ray:

During the period February 17-21, 2020, 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 27, 2020.

Four Reactor Operator (RO) and three Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. There were five 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
05000369/2020301 AND 05000370/2020301 dated April 24, 2020

Distribution:

D. Lanyi, RII

G. McCoy, RII

☒ PUBLICLY AVAILABLE☐ NON-PUBLICLY AVAILABLE☐ SENSITIVE☒ NON-SENSITIVEADAMS: ☒ YesACCESSION NUMBER ML20115E322☐

SUNSI REVIEW COMPLETE FORM 665 ATTACHED

OFFICE	RII:DRS	RII:DRS					
SIGNATURE							
NAME	DLANYI	GMCCOY					
DATE	04/23/2020	04/24/2020					
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES	YES NO	YES NO

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 05000369, 05000370

License No.: NPF-9, NPF-17

Report No.: 05000369/2020301 and 05000370/2020301

EPID No.: 2020-OLL-0010

Licensee: Duke Energy Carolinas, LLC

Facility: McGuire Nuclear Station, Units 1 & 2

Location: Huntersville, NC 28078-8985

Dates: Operating Test – February 17 - 21, 2020
Written Examination – February 27, 2020

Examiners: David Lanyi, Chief Examiner, Senior Operations Engineer
Daniel Bacon, Senior Operations Engineer
Michael Meeks, Senior Operations Engineer
Gary Callaway, Senior Reactor Technology Instructor

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

SUMMARY

ER 05000369/2020301 and 05000370/2020301; operating test February 17-21, 2020 & written exam February 27, 2020; 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 17-21, 2020. Members of the McGuire Nuclear Station training staff administered the written examination on February 27, 2020. Four RO and three SRO applicants passed both the operating test and written examination. Seven applicants were issued licenses commensurate with the level of examination administered.

There were five 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 performed an audit of license applications during the preparatory site visit in order to confirm that they accurately reflected the subject applicants' qualifications in accordance with NUREG-1021.

The NRC administered the operating tests during the period February 17-21, 2020. The NRC examiners evaluated seven 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 27, 2020. 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.

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

One issue related to examination security was identified during preparation and administration of the examination. The issue was immediately evaluated by the Chief Examiner and discussed with the Branch Chief. It was determined that no actual compromise of the examination occurred.

A supervisor that was on the exam security agreement inadvertently provided information that could have narrowed the scope of an administrative JPM to a manager that was not on the security agreement. The exam team informed the Chief Examiner and it was determined that that JPM would be changed.

Four RO applicants and three SRO applicants passed both the operating test and written examination. Three RO applicants and one SRO applicant passed the operating test but did not pass the written examination. Four RO applicants and three SRO 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 five post-examination comments concerning the operating test. A copy of the final written examination and answer key, with all changes incorporated, and the licensee's post-examination comments may be accessed not earlier than February 28, 2022 in the ADAMS system (ADAMS Accession Numbers ML20084L823 and ML20084L431).

4OA6 Meetings, Including Exit

Exit Meeting Summary

On February 21, 2020 the NRC examination team discussed generic issues associated with the operating test with Thomas Ray, 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.

KEY POINTS OF CONTACT

Licensee personnel

T. Ray	Site Vice-President
E. Pigott	Plant Manager
B Bare	Operations Manager
S. Moser	Training Manager
S. Hamm	ILT Supervisor
J. Thomas	Regulatory Affairs Manager
J. Hussey	Regulatory Affairs

FACILITY POST-EXAMINATION COMMENTS AND NRC RESOLUTIONS

A complete text of the licensee's post-examination comments can be found in ADAMS under Accession Number ML 20084L431.

Item 1

Operating Test: Administrative JPM RO A1a, Complete a Surveillance for Mode Change

Comment

The Task Standard for Admin JPM RO A1a was as follows:

"The operator will complete Enclosure 13.4 of PT/1/A/4600/003 D in accordance with the attached KEY, determine that all Flex Strategy Administrative Limits are met, and determine that LCO 3.5.1 is not currently met.

Although the JPM name is "complete a surveillance for mode change", the "Initiating Cue" never mentions performing the task for a mode change. Performing the JPM for the plant conditions listed in the "Initial Conditions" would result in the JPM being performed for Mode 4.

Tech Spec LCO 3.5.1 does not apply in Mode 4. Therefore, it was not critical to identify this LCO as not met.

It was requested that Admin JPM RO A1a, step 17, be updated to remove this step as a critical step.

NRC Resolution

The licensee's recommendation was partially accepted.

During development and validation of this JPM the exam writers and examiners assumed that the task stated that the applicant was to evaluate the plant condition to allow a Mode change. However, the cue given to the applicants stated that the surveillance was required to be performed "in order to continue the plant startup". During the exam it became evident that the wording was not clear and some of the applicants assumed that "continue the plant startup" meant prepare for a mode change while others took it to mean to continue on with the plant startup procedure. Therefore, depending on their view of what this term meant changed the applicability of TS 3.5.1. Therefore, two answers were determined to be acceptable for step 17. If the applicant stated that TS 3.5.1 was not applicable only because the unit was in Mode 4 or if the applicant stated that TS 3.5.1 prohibited entry into Mode 3, their answer was accepted as correct.

The answer key has been modified to reflect this change.

Item 2

Operating Test: Administrative JPM RO A2, Partial Loss of Annunciators.

Comment

The Task Standard for Admin JPM RO A2 is as follows:

"The operator will determine that there are Alternative Methods procedurally identified for Surveillance associated with three of these annunciators, that one failure impacts the Semi-Daily Surveillance associated with TS SR 3.6.4.1, that one failure impacts the Daily Surveillance associated with SLC 16.7.3, and that one failure impacts an AP/EP Time Critical Task per the attached KEY".

Per the Task Standard, only the items that are required to be identified in the applicable portion of the table are considered critical.

Identifying additional items in any of the table sections that are "no" or "none" would not be critical per the Task Standard.

For example: Identifying SLC 16.9.26 for 1AD-13, C-1 would not be correct because SLC 16.9.26 should be entered due to inoperable level monitors, not annunciator alarm issues. Therefore, including this information in a block where none was listed in the key would not be critical.

It was requested that the applicable table(key) in JPM RO A2 be updated to state "Identifying no or none in the applicable blocks of the table is NOT critical".

NRC Resolution

The licensee's recommendation was not accepted.

The NRC disagreed that identifying additional items were not critical in this case. The task was for the applicant to show proficiency in accurately identifying items that were limiting conditions for operation and less than or equal to one-hour action statements. Therefore, identifying additional items would be unsatisfactory.

An additional critical step was revealed in that SLC 16.9.26, an immediate time SLC requirement, was required to be entered for the C1 annunciator. The NRC disagreed with the facility's argument that identifying SLC 16.9.26 for 1AD-13, C-1 was not correct because SLC 16.9.26 had not been entered due to inoperable level monitors. This was illogical because if the annunciator was failed and locked-in, it could not perform its function of alerting the control room operators of actual high sump level conditions/flooding. Without a separate method to monitor the level, the failure of the

alarm system would result in the instrument being NON-FUNCTIONAL. Additionally, the table in the SLC specifically referenced the annunciator.

The only reason the task standard did not mention SLC 16.9.26 was that it was missed during development. SLC 16.9.26 was an Immediate Action SLC and should have been identified as a critical step.

The answer key and task standard were changed to add a new critical step. When annunciator 1AD-13, C1, ND & NS ROOM SUMP HI-HI LVL, was reviewed in Enclosure 13.1 of PT/1/A/4600/003 B, the applicants were expected to determine that this alarm failure impacted the performance of Enclosure 13.1, specifically the surveillance associated with SLC 16.9.26.

Item 3

Operating Test Control Room JPM H, Start and Stop the 1B NCP for NCS Venting.

Comment

Upon starting the 1B NCP per OP/1/A/6150/002 A (Reactor Coolant Pump Operation), one applicant immediately began to monitor NCP motor bearing temperatures on the 1B NCP OAC graphic. Motor bearing temperatures on the 1B NCP OAC graphic rose to a temperature of 207°F. Upon seeing this temperature, the applicant secured the 1B NCP.

Per OP/1/A/6150/002 A (Reactor Coolant Pump Operation) Limits and Precautions, NC Pump trip criteria are: Any pump motor bearing temperature exceeding 195°F.
Per AP-08 (Malfunction of NCP) Case II, NCP trip criteria are: Any pump motor bearing temperature exceeding 195°F.

It is requested that the applicant's response be graded as acceptable for the conditions present.

NRC Resolution

The licensee's recommendation was accepted.

Upon starting the NCP, the applicant immediately identified that the bearing temperatures exceeded the pump trip criteria. Following the applicant's completion of the JPM, the examiners requested to run the JPM without any applicants present. Bearing temperature did immediately spike above 195°F for approximately 2 seconds. During this period, the rest of the other applicants were observing that pump amperage and flow were responding as expected and therefore did not notice that the bearing temperatures had spiked for a very short time. Since all the applicants were briefed to believe their indications, the response of the single applicant to trip the pump was acceptable.

As described in the Simulator Fidelity Report, Simulator Discrepancy Report 1861 was generated to capture the issue.

The key has been changed to reflect that it would be acceptable to trip the NCP early if he or she noted the short-lived high bearing temperatures.

Item 4

Operating Test: In-Plant JPM K, Establish NC Pump Seal Injection from the SSF.

Comment

Performance of the "Establish NC Pump Seal Injection from the SSF" task was a short duration time critical action. Three minutes and 50 seconds was listed in plant documents for this particular portion of the task. This JPM should evaluate the correct manipulation of components. With the short duration of the task and the static mode of the JPM, communication of JPM cues and repeat backs would result in increased execution time.

The time critical nature of this task would be better evaluated by an active JPM using a simulator.

It was requested that the time critical criteria for this task be removed.

NRC Resolution

The licensee's recommendation was accepted.

The "as-run" JPM deviated slightly from the script. Instead of starting the JPM from the kitchen it was started from the door of the SSF and an "agreed-upon" time was subtracted from the standard time.

Additionally, several seconds were spent by the applicants for each step role-playing what they would see and perform to the examiner and then several seconds more were spent for the examiner to provide the appropriate indications. None of the applicants exceeded the target time by more than a few seconds.

Also, the artificiality of starting from a non-standard location and subtracting time was not in strict agreement with the definition of "time critical" in NUREG-1021. Therefore, this static mode of performing this JPM was not appropriate for being used as a time-critical task

The key has been changed to delete the time-critical aspect of the task.

Item 5

Operating Test: Scenario N20-1-1, Event 4 Dropped Rod.

Comment

During Event 2 Power Range Instrument N-42 fails high. With only three power ranges available and power greater than 75%, entry conditions into Tech. Spec 3.2.4 (QPTR) cannot be directly determined.

The original submittal identified Tech Spec 3.2.4 (QPTR) condition 'A' as being an applicable Tech Spec for this failure. It has since been determined that Tech Spec 3.2.4 (QPTR) is not applicable for this scenario.

The following information is from Tech Spec 3.2.4 (QPTR) and Tech Spec 3.2.4 Bases:

SR 3.2.4.2 NOTE:

"Only required to be performed if input from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER \geq 75% RTP"
Verify QPTR is within limit using the movable incore detectors.

SR 3.2.4.2 BASES:

"This Surveillance is modified by a Note, which states that it is required only when the input from one or more Power Range Neutron Flux channels are inoperable and the THERMAL POWER is \geq 75% RTP. With a NIS power range channel inoperable, tilt monitoring for a portion of the reactor core becomes degraded. Large tilts are likely detected with the remaining channels, but the capability for detection of small power tilts in some quadrants is decreased. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

For purposes of monitoring the QPTR when one power range channel is inoperable, the moveable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the indicated QPTR and any previous data indicating a tilt".

It was requested that the applicable ES-D-2 be updated to reflect that entry into Tech Spec 3.2.4 is NOT required.

NRC Resolution

The licensee's recommendation was accepted.

Each crew that was given this surveillance had this failure occur at greater than 75% RTP. Therefore, it is appropriate that the conditions for entry into Tech Spec 3.2.4 could not be determined until an incore flux mapping could be performed.

The key was modified to reflect this change.

SIMULATOR FIDELITY REPORT

Facility Licensee: McGuire Nuclear Station

Facility Docket No.: 05000369 and 05000370

Operating Test Administered: February 17-21, 2020.

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.

While conducting the simulator portion of the operating test, the examiners observed that the Reactor Coolant Pump bearing temperatures spiked excessively during a pump start. Specifically, when the Reactor Coolant Pumps were started for Reactor Coolant Loop sweeps, bearing temperatures instantly spiked more than 160 °F causing high temperature alarms to be present for less than 2 seconds. Simulator Discrepancy Report (DR) 1861 was generated to capture the issue.