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

October 3, 2017

William R. Gideon
Site Vice President
Brunswick Steam Electric Plant
8470 River Road, SE (M/C BNP001)
Southport, NC 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – NRC EXAMINATION REPORT 05000325/2017301 AND 05000324/2017301

Dear Mr. Gideon:

During the period July 24 through August 1, 2017, the Nuclear Regulatory Commission (NRC) administered operating tests to employees of your company who had applied for licenses to operate Brunswick Steam Electric Plant. 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 August 8, 2017.

Seven Reactor Operator (RO) and five Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. One SRO applicant passed the written examination while the operating test was waived. One SRO applicant failed the scenario portion of the examination. There was one JPM post-examination comment. Thirteen applicants were issued licenses commensurate with the level of examination administered. A Simulator Fidelity Report is included in this report as Enclosure 3.

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 10.

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.: 50-325, 50-324
License Nos.: DPR-71, DPR-62

Enclosures:
1. Report Details
2. Facility Post-Examination Comments and NRC Resolutions
3. Simulator Fidelity Report

cc: Distribution via Listserv

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – NRC EXAMINATION REPORT 05000325/2017301 AND 05000324/2017301

Distribution:
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G. McCoy, RII

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

OFFICE	RII:DRS	RII:DRS	RII:DRS	RII:DRS			
SIGNATURE	**PGC1 VIA EMAIL**	**JXV3 VIA EMAIL**	**MPE1 VIA EMAIL**	**GJM1**			
NAME	PCAPEHART	JVIERA	MEMRICH	GMCCOY			
DATE	9/28/2017	10/02/2017	9/28/2017	10/3 /2017			
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: G:\OLEXAMS\BRUNSWICK EXAMINATIONS\INITIAL EXAM 2017-301 (PHIL)\CORRESPONDENCE\BRUNSWICK 2017 301 EXAM REPORT.DOCX

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-325, 50-324
License No.:	DPR-71, DPR-62
Report No.:	05000325/2017301, 05000324/2017301
Licensee:	Duke Energy Progress, Inc.
Facility:	Brunswick Steam Electric Plant, Units 1 and 2
Location:	Southport, NC
Dates:	Operating Test – July 24 through August 1, 2017 Written Examination – August 8, 2017
Examiners:	Phillip Capehart, Chief Examiner, Senior Operations Engineer Joe Viera, Operations Engineer Matthew Emrich, Senior Reactor Technology Instructor
Approved by:	Gerald J. McCoy, Chief Operations Branch 1 Division of Reactor Safety

SUMMARY

ER 05000325/2017301, 05000324/2017301; operating test July 24 through August 1, 2017 & written exam August 8, 2017; Brunswick Steam Electric Plant, Units 1 and 2; Operator License Examinations.

Nuclear Regulatory Commission (NRC) examiners conducted an initial examination in accordance with the guidelines in Revision 10 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.

The operating tests and written examinations were developed by the NRC.

The NRC administered the operating tests during the period July 24 through August 1, 2017. Members of the Brunswick Steam Electric Plant training staff administered the written examination on August 8, 2017. Seven Reactor Operator (RO) and five Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. One SRO passed the written examination while the operating test was waived. One SRO applicant failed the simulator scenario portion of the examination. Thirteen applicants were issued licenses commensurate with the level of examination administered.

There was one JPM post-examination comment.

No findings were identified.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Operator Licensing Examinations

a. Inspection Scope

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 July 24 through August 1, 2017. The NRC examiners evaluated seven Reactor Operator (RO) and six Senior Reactor Operator (SRO) applicants using the guidelines contained in NUREG-1021. Members of the Brunswick Steam Electric Plant training staff administered the written examination on August 8, 2017 to seven SRO applicants and seven RO applicant. Evaluations of applicants and reviews of associated documentation were performed to determine if the applicants, who applied for licenses to operate the Brunswick Steam Electric Plant, met the requirements specified in 10 CFR Part 55, "Operators' Licenses."

The NRC evaluated the performance and 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, the written examination, and the operating test. All examination material was developed in accordance with the guidelines contained in Revision 10 of NUREG-1021. The licensee 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.

Seven Reactor Operator (RO) and five Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. One SRO passed the written examination while the operating test was waived. One SRO applicant failed the simulator scenario portion of the examination.Twelve applicants passed both the operating test and written examination and one applicant passed the written examination while the operating test was waived. Seven RO and six 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 one post-examination comment concerning an administrative JPM on the operating portion of the examination. A copy of the final RO and SRO written examinations and answer keys, with all changes incorporated, and the licensee's post-examination comment may be accessed not earlier than August 8, 2019 in the

ADAMS system (ADAMS Accession Numbers ML17263A601, ML17263A604, and ML17263A622, respectively).

4OA6 Meetings, Including Exit

Exit Meeting Summary

On August 1, 2017, the NRC examination team discussed generic issues associated with the operating test with Karl Moser, Plant General Manager, and members of the Brunswick Steam Electric Plant 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.

KEY POINTS OF CONTACT

Licensee personnel
Karl Moser, Plant Manager
Kurt Kruger, Nuclear Operations Manager
Jon Hicks, Nuclear Training Manager
Bryan Wooten, Nuclear Organizational Effectiveness Director
Andy Padleckas, Assistant Operations Manager, Support
Mark Similey, Nuclear Operations Training Manager
Ed Rau, Nuclear Operations Training Supervisor
James Buckingham, Nuclear Operations Training Supervisor
John Miller, Assistant Operations Training Manager
Craig Oliver, Nuclear Control Room Supervisor
Lee Grzeck, Nuclear Regulatory Affairs Manager
Michael Braden, Senior Nuclear Engineer
Mike Gibson, Nuclear Operations Training Instructor
Brian Stetson, Nuclear Operations Training Instructor
Josh Ashcroft, Nuclear Operations Training Instructor

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 ML17263A622.

Item

Admin JPM: RC-1 determining TEDE while working in a High Airborne Area.

Comment:

The licensee commented that the standard for step 2 and step 4 was inadequate.

Below is the explanation for step 2 and step 4 of RC-1

Step 2 - Determine internal dose while wearing a respirator.

STANDARD-Internal dose with respirator determined to be 0 mrem

Explanation:

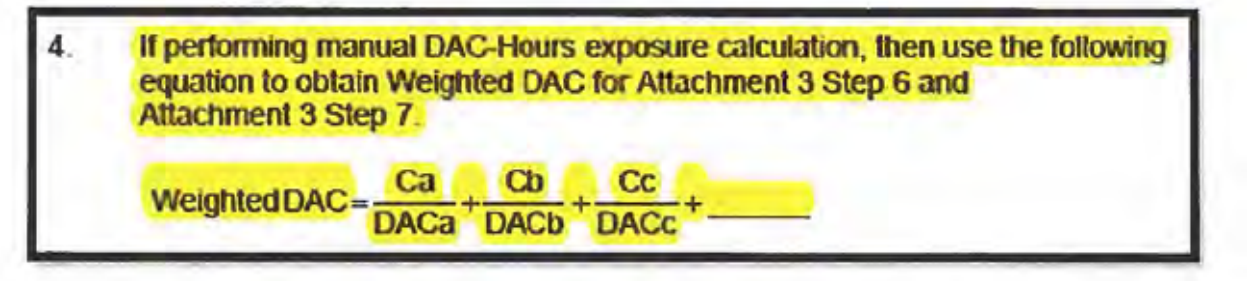
For step two, internal exposure is assumed to be zero based on using a powered air purifying respirator which due to positive pressure is assumed to allow no internal exposure.

However, if using AD-RP-ALL-2019, to calculate internal dose it would actually be calculated to be .0521 mrem.

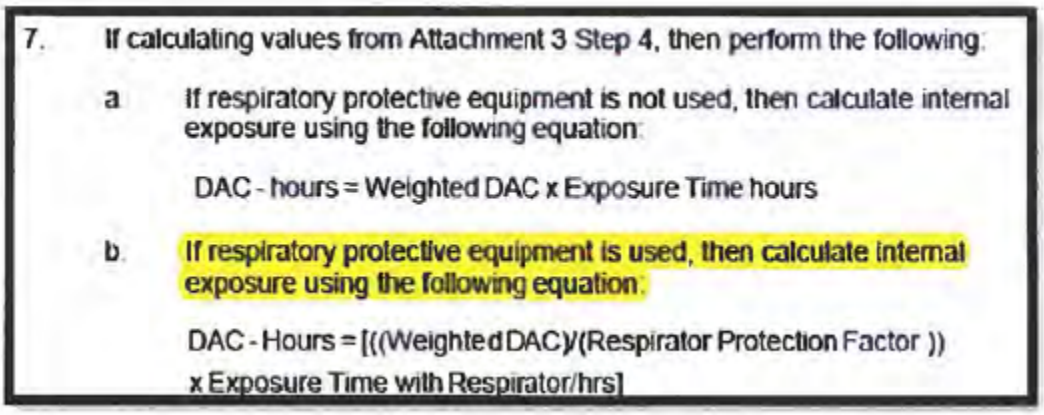
Below is an explanation of how to determine this value.

Given in the stem is a weighted DAC of 50.

IAW attachment 3 step 4 this weighted DAC is the equivalent of all the individual respective nuclide DAC values.



This weighted DAC of 50 is then used in the following equation from attachment 3 step 7b to calculate DAC-hours for internal dose.



7. If calculating values from Attachment 3 Step 4, then perform the following:

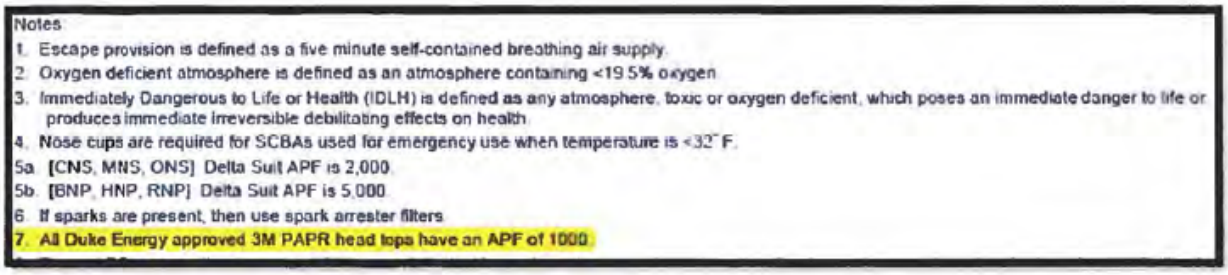
a. If respiratory protective equipment is not used, then calculate internal exposure using the following equation:

DAC - hours = Weighted DAC x Exposure Time hours

b. If respiratory protective equipment is used, then calculate internal exposure using the following equation:

DAC - Hours = [((Weighted DAC)/(Respirator Protection Factor))
x Exposure Time with Respirator/hrs]

The respirator protection factor is 1000 for all duke PAPRs based on attachment 1 note 7



Notes:
1. Escape provision is defined as a five minute self-contained breathing air supply.
2. Oxygen deficient atmosphere is defined as an atmosphere containing <19.5% oxygen.
3. Immediately Dangerous to Life or Health (IDLH) is defined as any atmosphere, toxic or oxygen deficient, which poses an immediate danger to life or produces immediate irreversible debilitating effects on health.
4. Nose cups are required for SCBAs used for emergency use when temperature is <32° F.
5a. [CNS, MNS, ONS] Delta Suit APF is 2,000.
5b. [BNP, HNP, RNP] Delta Suit APF is 5,000.
6. If sparks are present, then use spark arrester filters.
7. All Duke Energy approved 3M PAPR head tops have an APF of 1000.

The exposure time is 25 minutes which is given in the initial conditions.

Therefore the equation is solved as follows:

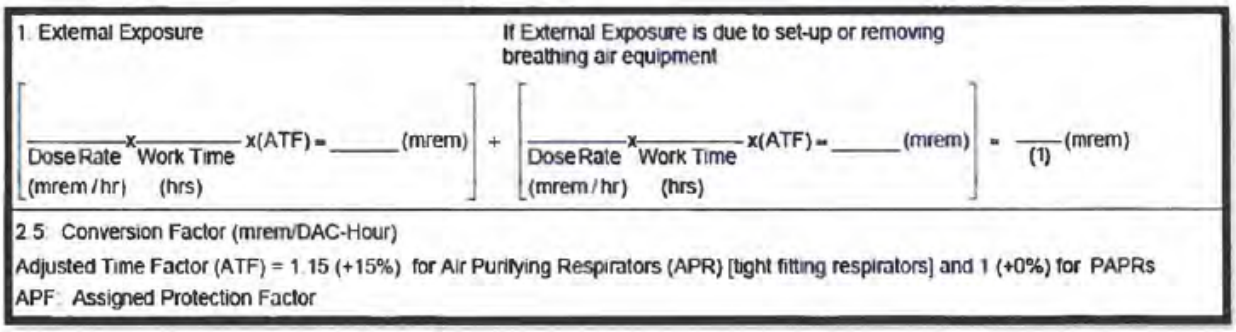
DAC-Hours= [(50/1000) x 25/60]
DAC-Hours= .0208
Internal Dose = DAC-Hours x 2.5
Internal Dose=.0208 x 2.5
Internal dose=.0521 mrem
This internal does of .0521 mrem is ~0.

Step 4 - Determine total exposure while wearing a respirator.

STANDARD-Total dose with respirator determined to be 193.8 mrem (Acceptable range is 193. 7 mrem to 195.3 mrem). (see key)

Explanation:

Total dose is the sum of external exposure and internal exposure. This total dose can be solved using AD-RP-ALL-2019 Attachment 2.



External exposure is calculated as follows based on the above equation:

Dose rate is given as 465 mrem/hr
Work time is 25 minutes
ATF for PAPRs is 1
465 x (25/60) x 1 =193.7 to 195.3 mrem
Therefore external exposure=193.7 to 195.3 mrem
Internal exposure was calculated above in step 2 as either 0 or .0521 mrem.
Total exposure is (193.7 to 195.3 mrem external dose) + (0 to .0521 mrem internal dose)
Therefore total exposure= 193.7 mrem to 195.821 mrem.

NRC Resolution

The licensee's recommendation was accepted.

The NRC agrees with the new standard as determined by the licensee and incorporated the new standards into the final revision of the JPM.

The JPM has been changed to reflect the new standards for step 2 and step 4.

SIMULATOR FIDELITY REPORT

Facility Licensee: Brunswick Steam Electric Plant

Facility Docket No.: 05000325, 05000324

Operating Test Administered: July 24– August 1, 2017

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.