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

August 30, 2019

Mr. Charles Kharrl
Southern Nuclear Operating Co., Inc.
Joseph M. Farley Nuclear Plant
7388 North State Highway 95
Columbia, AL 36319-0470

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT – NRC OPERATOR LICENSE EXAMINATION REPORT 05000348/2019301 and 05000364/2019301

Dear Mr. Kharrl:

During the period June 10 – 20, 2019, the Nuclear Regulatory Commission (NRC) administered operating tests to employees of your company who had applied for licenses to operate the Joseph M. Farley Nuclear 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 June 26, 2019.

Seven Reactor Operator (RO) and five Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. One SRO applicant failed the operating test, and one SRO applicant failed the written examination. There were two post-administration comments concerning the written examination. These comments, and the NRC resolution of these 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) 997-4662.

Sincerely,

/RA/

Eugene F. Guthrie, Chief
Operations Branch 2
Division of Reactor Safety

Docket Nos: 50-348 and 50-364
License Nos: NPF-2 and NPF-8

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

cc:
Ms. Cheryl A. Gayheart
Regulatory Affairs Director
Southern Nuclear Operating Co., Inc.
3535 Colonnade Parkway
Birmingham, AL 35243

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT – NRC OPERATOR LICENSE EXAMINATION REPORT 05000348/2019301 and 05000364/2019301 dated August 30, 2019

* See previous page for concurrence

DOCUMENT NAME:G:\OLExams\Farley Examinations\Initial Exam 2019-301\Correspondence\Farley 2019-301 Exam Report.docx
Adams Accession: ML19242B764

OFFICE	RII/DRS/OB:OLA	RII/DRS/OB:CE	RII/DRS/OB:BC
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DATE	8/ 27 /19	8/ 29 /19	8/ 30 /19

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Examination Report

Docket No.:	05000348, 05000364
License No.:	NPF-2, NPF-9
Report No.:	05000348/2019301 and 05000364/2019301
Licensee:	Southern Nuclear Company (SNC), LLC
Facility:	Joseph M. Farley Nuclear Plant
Location:	Columbia, AL
Dates:	Operating Test – June 10 – 20, 2019 Written Examination – June 26, 2019
Examiners:	M. Meeks, Chief Examiner, Senior Operations Engineer M. Kennard, Operations Engineer N. Lacy, Operations Engineer
Approved by:	Eugene F. Guthrie, Chief Operations Branch 2 Division of Reactor Safety

SUMMARY

ER 05000348/2019301, 05000364/2019301; June 10-20, 2019 & June 26, 2019; Joseph M. Farley Nuclear Plant; 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 Joseph M. Farley Nuclear Plant staff developed both the operating tests and the written examination. The initial operating test, written RO examination, and written SRO examination submittals met the quality guidelines contained in NUREG-1021.

The NRC administered the operating tests during the period June 10-20, 2019. Members of the Joseph M. Farley Nuclear Plant training staff administered the written examination on June 26, 2019. Seven Reactor Operator (RO) and five Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. Twelve applicants were issued licenses commensurate with the level of examination administered.

There were two 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 (RO and SRO 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 June 10 - 20, 2019. The NRC examiners evaluated seven Reactor Operator (RO) and seven Senior Reactor Operator (SRO) applicants using the guidelines contained in NUREG-1021. Members of the Joseph M. Farley Nuclear Plant training staff administered the written examination on June 26, 2019. Evaluations of applicants and reviews of associated documentation were performed to determine if the applicants, who applied for licenses to operate the Joseph M. Farley Nuclear Plant, 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 Joseph M. Farley Nuclear Plant 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.

Seven RO applicants and five SRO applicants passed both the operating test and written examination. One SRO applicant passed the operating test but did not pass the written examination. One SRO applicant passed the written examination but did not pass the operating test. Seven RO applicants and five 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 two post-examination comments concerning the written examination. A copy of the final written examination and answer key, with all changes incorporated, may be accessed may be accessed not earlier than September 21, 2021, in the ADAMS system (ADAMS Accession Number(s) ML19239A461 and ML19239A463).

4OA6 Meetings, Including Exit

Exit Meeting Summary

On June 20, 2019, the NRC examination team discussed generic issues associated with the operating test with C. Kharrl, Senior Vice President, Joseph M. Farley Nuclear Plant, and other members of the Joseph M. Farley Nuclear Plant staff. The examiners asked the licensee if any of the examination material was proprietary. No proprietary information was identified.

KEY POINTS OF CONTACT

Licensee personnel

C. Kharrl	Site Vice President
J. Andrews	Work Management Director
O. Arrnes	Maintenance Director
J. Austin	Training Director
O. Bertagnolli	Operations Training Requalification Lead
D. Erb	Operations Director
R. McAdams	Engineering Director
V. Richter	Operations Training Initial Lead
B. Reed	Operations Service Manager
S. Schwindt	Operations Training Manager
G. Surber	Licensing Manager

NRC personnel

P. Meier	Resident Inspector

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 ML19239A458.

Item

Question 2, K/A 003K3.02 – Knowledge of the effect that a loss or malfunction of the Reactor Coolant Pump System (RCPS) will have on the following: Steam Generators (S/G)

Comment

The licensee recommends deleting this question from the exam due to no correct answer being provided. As ran on the plant referenced simulator, steam generator pressures rise rapidly for approximately 40 seconds after the initiating event followed by stabilization at approximately 55 seconds and beyond.

Basis:

1. This question asks the examinee to predict what a trend of Steam Generator (SG) pressures would be at a specific time after trip of a Reactor Coolant Pump from 100% power. It asks for trends of both an affected loop and unaffected loop. The question asks the examinee to identify the direction of the trend (bolded and underlined) "**at 60 seconds after**."

2. Simulator Integrated Plant Computer (IPC) trends were analyzed after the loss of an RCP. Based on the trends (attached) Steam generator pressures rise rapidly for approximately 40 seconds after the initiating event followed by stabilization at approximately 55 seconds and beyond with steam dumps operating to maintain pressure.

3. See attached IPC trends from the Plant Reference Simulator for BOL, MOL, EOL conditions. [NOTE: available at the ADAMS number referenced above] IPC trends represent a trip of the C RCP, and values for B/C SG pressures as provided in the stem.

4. Looking at the specificity of the time stated in the question and the trends from the IPC, the correct answer is - stable for both SGs. The correct answer was not provided on the exam.

5. Based on the exam validation genealogy and exam question analysis this question was originally written to test knowledge of the comparison of steam generator pressure from 100% steady state power to that following a RCP trip and reactor trip. Iterative changes and adjustments to the wording resulted in a different question than originally validated. The final exam version of the question asks the trend at a specific moment in time (60 seconds) and contains no correct answer.

Facility Licensee Position:

Question 2- The facility agrees with the student's recommendation to remove question 2 from the exam due to no correct answer available. The question asks what is happening to the SG Pressure 60 Seconds after the transient. While the pressure was greater at one minute than at the start, the pressure at 60 seconds has stabilized. There is no choice for a stable pressure therefore there is no correct answer.

NRC Resolution

The licensee's recommendation was accepted.

As mentioned above in the facility's contention, the original intent of this question was to test knowledge of the comparison of Steam Generator (S/G) pressures at an initial state of 100% power, steady-state operation; and S/G pressures following a Reactor Coolant Pump (RCP) trip in both an idle and operating Reactor Coolant System (RCS) loop. Due to various modifications made during exam review and validation, the question was changed to ask the applicant to demonstrate knowledge of the S/G pressure trends at a point in time exactly 60 seconds after the RCP trip. This point of time was initially chosen to ensure that the S/G pressure trends would all be consistent with their initial trends post-RCP trip.

It is technically valid that both the 'C' and 'B' S/G pressures would be rising 60 seconds after the '1C' RCP trips from 100% power (and the Unit 1 Reactor also trips). However, at 60 seconds post-trip, the S/G pressures are rising extremely slowly (*e.g.*, ~0.019 psig/s in the 'C' S/G and ~0.029 psig/s in the 'B' S/G as run on the Farley plant referenced simulator). From the standpoint of operational validity, these rates are so small that they would go unnoticed on the control board instrumentation. Therefore, an operator would be correct to evaluate the 'C' and 'B' S/G pressures as being 'stable' at the 60-second post-trip time; in other words, in the control room it would be incorrect to evaluate the S/G pressure as "rising."

Because the question did not provide "stable" as an answer option, the NRC agreed with the facility licensee that the question did not provide an operationally valid correct answer. NUREG-1021, section ES-403 D.1.c stated "If three or more answers could be considered correct or there is no correct answer, the question shall be deleted." Therefore, in accordance with ES-403 section D.1.c, the NRC deleted Question 2 from the site-specific Farley 2019 written examination, and graded all applicants' written examinations accordingly.

Item

Question 61, K/A 103A1.01 – Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the Containment system controls including: Containment pressure, temperature, and humidity.

Comment

The licensee recommends deleting this question from the exam due to no correct answer being provided. Part two of this question is invalid because there is no procedural guidance that can be implemented at time 2200. No FNP procedure exists to vent containment in Modes 1-4 if greater than 1 psig and less than 2 psig.

Basis:

1. The second part of this question places the examinee at a point where no TS values have been exceeded.

2. Question asks what actions are REQUIRED at 2200. At this time, for the operating team to stay within SOP guidance, the pressure rise should be addressed by implementing SOP-12.2. Because pressure is greater than 0.4 psid, SOP-12.2 will direct the operator to SOP-10 for POST LOCA VENTING, Attachment 1. SOP-10, Attachment 1, will direct the operator to commence venting prior to 1.0 psig. Conditions in Containment at 2200 would be 1.5 psig, so the guidance in the SOP will not allow the operator to commence venting. At time 2200, Containment conditions would be outside of the procedure initial conditions, and the operator would then be required to involve Operations Management to proceed.

3. Precaution and limitation of SOP -10, Attachment 1, requires the vent to be commenced if pressure is less than 1 psig.

4. At time 2200 pressure would reach 1.5 psig, which would prevent the operator from using the procedure for venting containment in Modes 1-4, when pressure is between 1 psig and less than 2 psig.

Facility Licensee Position:

Question 61-The facility agrees with the student's recommendation to remove question 61 from the exam due to no correct answer available. The first part of the question has a correct answer. The second portion of the question does not have an answer consistent with station policies. The question would drive the student to assess the proper actions to take at 2200. Containment pressure is 1.5 psig, which is above normal operating values. An operator would use SOP-12.2 to lower pressure. SOP-12.2 would then direct the operator to SOP-10, Attachment 1. The Precaution and Limitation at the beginning of Attachment 1 stated, "If in Modes 1-4 AND performance of this appendix is required, the release should begin prior to CTMT pressure reaching 1.0 psig." The expectation for Farley Nuclear Plant operators when Precautions and Limitations are not met is to stop and get the larger Farley team engaged in the decision as to how to move forward. Since in this case, they did not meet the Precautions and Limitations, the correct action was to stop and allow the team to weigh in on the actions to move forward. This was not an option for one of the answers on the second portion of the question, therefore there was no correct answer.

NRC Resolution

The NRC deleted Question 61 from the examination. The basis for this action was as follows:

The second part of Question 61 stated: “At 2200 Operators are required to _____ to address the parameter chosen above.” The correct parameter chosen above is Containment pressure (first part question), and at time 2200 Containment pressure is explicitly stated to be (+) 1.5 PSIG in the Question 61 stem. Accordingly, the second part of Question 61 may be re-stated as follows: “Operators are required to [either ‘Start Containment mini-purge’ or ‘Vent Containment’] to address that Containment pressure has risen from (-) 0.5 psig to (+) 1.5 psig in a 12 hour time frame, and is currently at (+) 1.5 psig.”

The facility licensee rationale was that, because Containment pressure is (+) 1.5 psig; and there is a precaution and limitation that stated: “If in Modes 1-4 AND performance of this appendix is required, the release should begin prior to CTMT pressure reaching 1.0 psig;” then because the operators “… did not meet the precautions and limitations, the correct action is to stop and allow the team to weigh in on the actions to move forward.” Although this may be a correct administrative response to a potential procedure variance, stopping any operational actions to

allow the team to caucus and weigh in on actions to move forward does not provide an answer the second part question, which specifically requires the applicant to choose an action " to address the parameter chosen above." Stopping to determine a course of action would not address the containment pressure condition, and therefore would not be a correct answer to the second part question.

Moreover, the procedural Precaution and Limitation (P&L) cited above ("If in Modes 1-4 AND performance of this appendix is required, the release should begin prior to CTMT pressure reaching 1.0 psig") is a recommendation ("… should begin prior to …") and not a requirement. Therefore, the procedures needed to be examined as part of the NRC review to determine which course or course(s) of action were available to the operators, given the conditions provided in the question.

Based on the question stem, the NRC found that, at time 1000, Containment pressure would be (-) 0.5 psig and would begin to rise. At this Containment pressure, the mini-purge system could be placed in operation to address the rising pressure parameter. However, P&L 6. of Farley procedure FNP-1-SOP-12.2, "Containment Purge and Pre-Access Filtration System," stated: "Mini-purge supply and exhaust fans shall NOT be started with CTMT [Containment] pressure greater than 0.25 psid." Furthermore, P&L 5. of SOP-12.2 stated: "Main and mini-purge supply and exhaust dampers must NOT be opened with CTMT pressure greater than 0.4 psid." Accordingly, if (hypothetically) operators had started a mini-purge at approximately time 1000, by 0.25 psig they would have secured fans, and by 0.4 psig the supply and exhaust dampers would be required to be closed. Therefore, because by 2200 Containment pressure is explicitly stated to be (+) 1.5 psig, the NRC concluded that "Start Containment mini-purge" would definitely be a technically incorrect answer to the second part question statement.

As described in the question stem, as Containment pressure continued to increase beyond 0.4 psig, P&L 7. of SOP-12.2 would apply: "If unable to commence a batch release of CTMT per Attachment 3 prior to exceeding 0.4 psid, FNP-1-SOP-10.0 Attachment 1 may be used for instructions for venting CTMT." Therefore, it would be operationally valid to use SOP-10.0 Attachment 1, "Venting Containment to Reduce Containment Pressure When Containment Purge is Secured," to vent Containment to address the rising Containment pressure parameter, and therefore "Vent Containment" (distractor choice 'B,' the initially keyed answer) is potentially a technically correct answer. The only P&L of Attachment 1 of SOP-10.0 ("If in Modes 1-4 AND performance of this appendix is required, the release should begin prior to CTMT pressure reaching 1.0 psig") has already been shown to be a recommendation and not a requirement, and therefore would not preclude operators from starting a Containment vent at time 2200 with Containment pressure at (+) 1.5 psig, if the operators so decided.

However, although venting Containment has been shown to be an operationally valid option, the second part question statement specifically stated "… Operators are required to …" [emphasis added]. From the standpoint of precise technical validity, the NRC agreed, in part, with the licensee's assertion that "No FNP procedure exists to vent containment in Modes 1-4 if greater than 1 psig and less than 2 psig." Or, more specifically, there is no FNP procedural requirement to commence or continue a Containment Vent operation when Containment pressure is specifically at (+) 1.5 psig. There are requirements to lower Containment pressure when pressure reaches 2.0 psig; however, that is not what Question 61 asked the applicants to evaluate. The NRC determined that operators are not procedurally required to begin or continue venting Containment when pressure is (+) 1.5 psig. Therefore, the NRC agreed with the contention there was not a technically correct answer to the second part question.

More broadly, Question 61 was an RO-level question, not an SRO-level question; it was not intended that the question require a detailed knowledge of the procedures referred to in this analysis. The procedures listed above were not referenced in the question stem or distractors. It was intended that the applicant utilize system-level RO knowledge to understand that at Containment pressures greater than 0.4 psig, mini-purge was not allowed to be placed in service, and therefore Containment vent was the only other alternative.

In conclusion, the NRC determined that because there was not a specific requirement to vent Containment at (+) 1.5 psig, there was not a technically valid answer provided to the applicants. NUREG-1021, section ES-403 D.1.c stated “If three or more answers could be considered correct or there is no correct answer, the question shall be deleted.” Therefore, in accordance with ES-403 section D.1.c, the NRC deleted Question 61 from the site-specific Farley 2019 written examination, and graded all applicants’ written examinations accordingly.

SIMULATOR FIDELITY REPORT

Facility Licensee: Joseph M. Farley Nuclear Plant

Facility Docket No.: 05000348, 05000364

Operating Test Administered: June 10-20, 2019

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.