UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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August 30, 2001

Southern Nuclear Operating Company, Inc.
ATTN: Mr. D. N. Morey
Vice President
P. O. Box 1295
Birmingham, AL 35201

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT - NRC EXAMINATION REPORT 50-348/2001-301 AND 50-364/2001-301

Dear Mr. Morey:

On July 26, 2001, the Nuclear Regulatory Commission (NRC) completed administration of operating examinations to employees of your company who had applied for licenses to operate the Joseph M. Farley Nuclear Plant, Units 1 and 2. The enclosed report documents the examination results and findings which were discussed on July 27, 2001, with Mr. L. Williams and other members of your staff. The written examination was administered by your staff on July 30, 2001.

Three Reactor Operator and six Senior Reactor Operator applicants passed the operating examinations. One Reactor Operator and one Senior Reactor Operator applicant failed the written examination and all other applicants passed the written examination, including two Senior Reactor Operator written re-take examinations. NRC Post Examination comment resolution is included as Enclosure 2.

No findings of significance were identified.

In accordance with 10 CFR 2.790 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 NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Michael E. Ernstes, Chief
Operator Licensing and
Human Performance Branch
Division of Reactor Safety

Docket Nos. 50-348, 50-364
License Nos. NPF-2, NPF-8

Enclosures: (See page 2)

Enclosures: 1. NRC Exam Report Nos. 50-348/2001-301 and 50-364/2001-301
2. Farley Post Examination Comment Resolution

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NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-348, 50-364
License Nos.:	NPF-2, NPF-8
Report No.:	50-348/2001-301 and 50-364/2001-301
Licensee:	Southern Nuclear Operating Company, Inc. (SNC)
Facility:	Joseph M. Farley Nuclear Plant Units 1 and 2
Location:	7388 N. State Highway 95 Columbia, AL 36319
Dates:	Operating Tests - July 23 - 26, 2001 Written Examination - July 30, 2001
Examiners:	R. Baldwin, Chief, Senior Operations Engineer L. Miller, Operations Engineer S. Rose, Operations Engineer
Approved by:	M. Ernstes, Chief Operator Licensing and Human Performance Branch Division of Reactor Safety

Enclosure 1

SUMMARY OF FINDINGS

ER 05000348-01-301 and 05000364-01-301, on July 23 - 26, 2001, Southern Nuclear Operating Co. Inc., Joseph M. Farley Nuclear Plant Units 1 and 2.

Operator licensing initial examinations were developed by the NRC and administered by NRC examiners in accordance with the guidance of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 8, Supplement 1. The examination implemented the operator licensing requirements of 10 CFR §55.41, §55.43, and §55.45.

No Color. Three Reactor Operator (RO) and six Senior Reactor Operator (SRO) applicants passed the operating examinations. One RO applicant and one SRO applicant failed the written examination. Two SRO written re-take applicants passed the written examination. All applicants that passed the operating and written examinations were issued operator licenses commensurate with the level of examination administered.

No significant findings were identified.

Report Details

4. OTHER ACTIVITIES (OA)

4OA5 Operator Licensing Initial Examinations

a. Inspection Scope

The NRC examination team developed operating tests and written examinations in accordance with NUREG 1021, "Operator Licensing Examination Standards for Power Reactors," Revision 8, Supplement 1. The Joseph M. Farley Nuclear Plant examiners reviewed the proposed examination. Examination changes agreed upon between the NRC and the licensee were made according to NUREG-1021 and incorporated into the final version of the examination materials. The NRC administered the approved operating tests during the period of July 23-26, 2001, to three RO applicants and six SRO applicants. The license staff administered the approved written examination on July 30, 2001 to eleven applicants. The examiners reviewed the examination security measures to ensure examination security and integrity.

b. Issues and Findings

No findings of significance were identified.

Two of the three RO and five of the six SRO applicants passed both written and operating examinations. The two re-take applicants passed the written examination. One RO and one SRO applicant failed the written examination. Details of each applicant's deficiencies are described in the individual's examination report, Form ES-303-1, "Operator Licensing Examination Report." Copies of the evaluations have been forwarded under separate cover to the Training Manager in order to enable the licensee to evaluate these deficiencies and provide appropriate remedial training for those operators as necessary.

The licensee submitted four post-examination comments concerning the written examination (ADAMS Accession Number ML012220225). The written examinations and answer keys may be accessed in the ADAMS system under ADAMS Accession Numbers ML012340214 and ML012340232, RO and SRO respectively.

4OA6 Meetings

Exit Meeting Summary

The Chief Examiner and Chief Examiner Under Instruction presented the preliminary examination results on July 27, 2001, to members of licensee management. The licensee acknowledged the examination results presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

LIST OF PERSONS CONTACTED

C. Collins, Operations Manager
P. Crone, Licensing Supervisor
J. Horn, Operations Training Supervisor
R. Johnson, Assistant General Manager, Operations
R. Lulling, Operations Superintendent
R. Odom, Instructor, Nuclear
G. Ohmstede, Instructor, Nuclear
W. Oldfield, Safety Audit & Engineering Review, Supervisor
J. Powell, Senior Plant Instructor
M. Stinson, Plant General Manager
L. Williams, Training and Emergency Preparedness, Manager

FARLEY POST EXAMINATION COMMENT RESOLUTION

QUESTION #2 RO/#3 SRO:

Recommendation not accepted.

The NRC agrees with the licensee's comment that answer A could be considered a correct answer and that D could also be considered a correct answer. Upon further analysis the NRC has determined that answer B could be considered a correct answer. "Operator Licensing Examination Standards," NUREG 1021, ES-403, Section D.1.b requires "If three or more answers could be considered correct or there is no correct answer, the question shall be deleted." The NRC determined that this question had three answers that could be considered correct therefore, this question will be deleted from the examination and total points adjusted appropriately.

The NRC reviewed the licensee's comments; the licensee's provided supporting information; the Farley Nuclear Station Updated Safety Analysis Report (USFAR) section 4.3, (Nuclear Design) and sections 15.2.1, 15.2.2, 15.3.6, and 15.4.6 (analysis for continuous rod withdrawal and rod ejection accidents); and Farley Nuclear Plant Lesson Plan, OPS-402041, "Full Length Rod Control." The review revealed that the facility's reference material was silent concerning pre-event rod position in reference to a continuous rod withdrawal event.

The review revealed that the Rod Insertion Limit (RIL) serves three purposes:

1. To maintain adequate shutdown margin.
2. To prevent fuel cladding failures in the event of a LOCA, loss of flow, ejected rod, or other accident requiring termination by an RTS trip function.
3. To minimize the amount of positive reactivity added by an ejected rod.

Rod Insertion Technical Specification 3.1.6, "Control Bank Insertion Limits," bases on page B 3.1.6-2 states, in part, that "...the shutdown and control bank insertion limits ensure the required SDM (Shutdown Margin) is maintained." Technical Specification 3.1.1, "Shutdown Margin (SDM)," page B 3.1.1-1, additionally states that "During power operation, SDM control is ensured by operating with the shutdown banks fully withdrawn and the control banks within the limits of LCO 3.1.6." Technical Specification 3.1.6 bases further states, in part that, "The SDM requirement is ensured by limiting the control and shutdown bank insertion limits..." Answer A states "Increasing the Rod Insertion Limit (RIL) as power increases," and answer B states "Maintaining the control bank at the RIL to provide immediate negative reactivity," the NRC has determined that these two statements are considered equivalent, in that, if the RIL increases as power increases, keeping the control rod bank at the RIL provides the same protection answer A does. The licensee's argument as applied to answer A can also be applied to answer B, resulting in three answers that could be considered correct.

In conclusion, the NRC has determined that based on the above discussion this question has three potentially correct answers and will be deleted and the examination point value adjusted.

QUESTION #23 RO/#21 SRO:

Recommendation not accepted.

The answer key will reflect only one correct answer, that being the original answer "A." The question placed the applicant at a Note following step 16.1 of procedure EEP-1, Loss of Reactor or Secondary Coolant. The Note states that "Step 16.1 must be completed before continuing with this procedure." Procedure Step 16.1 states, "Check RWST level - LESS THAN 12.5 ft." The question asks "Which ONE of the following describes the basis for the above note?" The knowledge item being tested is the basis for allowing the RWST level to decrease to12.5 feet prior to transferring to ESP-1.3, "Transfer to Cold Leg Recirculation."

The licensee indicated that answers "A" and "D" were both correct. Answers "B" and "C" were not contested by the licensee. Answer "A", the original answer, is to ensure the maximum amount RWST water is used and still allow adequate suction transfer time. Answer "D" is to ensure level in the containment sump is high enough to provide adequate suction head for the low head safety injection (LHSI) pumps. The licensee stated that the note was added to alert the operator to wait until RWST level reached 12.5 ft prior to going to ESP-1.3. Therefore the basis of the note is the same as the basis of the 12.5 ft.

The licensee provided reference material (A-181002) that describes the reasons for the RWST low (12.5 ft) and low-low (4.5 feet) level alarms. This reference stated that the RWST Low and Low-Low Level must assure sufficient volume is available to:

1. Provide adequate time to complete ECCS and CSS switchover to sump recirculation. This is the root of the original NRC answer "A".

2. Provide adequate NPSH for the ECCS and CSS pumps. (The NRC determined that this reason deals with the RWST level when the RWST is the suction source and not the containment sump level.

3. Prevent vortexing of the CS pumps. (The NRC determined that this reason also deals with the RWST tank level when the RWST is the suction source and not the sump level.

The reference document describes the RWST design features (above) not the amount of water provided to the sump and LHSI pump suction head requirements. While it is desirable to have the containment sump high enough to provide adequate suction head for the LHSI pumps this does not provide an answer to why it is required to allow the RWST to get as low as 12.5 feet prior to transferring to cold leg recirculation. Providing water to the sump is a consequence of a lowering level in the RWST during the time step 16.1 of procedure EEP-1, Check RWST level - LESS THAN 12.5 ft and the note in question is being applied. A transition to procedure FNP-1-ESP-1.3, Transfer to Cold Leg Recirculation, at procedure step 16.2 of EEP-1 is not initiated based upon sump level. The note in question is applied irrespective of sump level or LHSI net positive suction head (NPSH).

Reviewing EEP-1, Loss of Reactor or Secondary Coolant, between steps 14 and 16 it was found that the procedure does not address containment sump level. The procedure does not have the operator check sump level in steps 14 or 15. Sump level is not checked until after the transfer to ESP-1.3, Transfer to Cold Leg Recirculation (step 7.1).

Reference document A-181002 identified the following three functional requirements of the RWST:

1. Volume required to fill the refueling cavity in preparation for refueling the reactor. (This aspect of the requirements was not applicable to the question.)

2. Adequate volume to supply all the ECCS and containment spray pumps following a large break LOCA, allowing sufficient time for operators to take manual actions (This aspect of the requirement, allowing sufficient time for operators to take manual actions, is accomplished by performing step 16.1 of procedure EEP-1, Check RWST level - LESS THAN 12.5 ft.) The response not obtained for this step is to Return to step 14 of the procedure. As a result of these actions, the maximum amount of RWST water used is ensured. In accordance with site Lesson Plan OPS-52530B, page 28, the operators will continue to loop back through the procedure to monitor plant parameters until the level is reached for transfer to recirculation. When the switchover criteria is met (Page 29) the team should immediately begin the transfer to ESP-1.3 to ensure cooling flow to the core, prevent damage to the pumps taking suction from the RWST, and prevent damage to the RWST.

3. Adequate volume to supply enough water to emergency sumps to provide a suction supply to the ECCS pumps during long term SI recirculation. This is a requirement for RWST minimum level for pre-event. This requirements does address volume to the sump, however, it does not address the basis of the note in question. Sump volume may be a consequence of level decreasing in the RWST and is a desired consequence. However, step 16.1 of procedure EEP-1 and the note proceeding step 16.2 does not concern itself with sump level.

FNP-FSAR, section 6.3.2.2.7, “B.” Recirculation Mode, states, in part, the low level signal (RWST) is alarmed to inform the operator (in this case this will occur while step 16.1 of procedure EEP-1 and the note in question is being applied) to initiate the manual action required to realign safeguards pumps to the recirculation mode. To evaluate whether there is sufficient time to perform the required actions, an analysis has been performed by the licensee to determine the amount of time available for the case of maximum safeguards flow from the RWST. Based upon these maximum flowrates, conservative operator action times and valve cycle times, the ECCS switchover is completed approximately 10 minutes after the RWST low-level switchover setpoint is reached.

This aspect of the analysis ensured that the volume of the RWST was adequate to allow suction transfer at the same time use the maximum amount of RWST water to prevent the loss of components due to the loss of the RWST as a suction source. These elements support the original answer “A” as the correct answer. In conclusion, the NRC has determined the question will remain as initially graded.

QUESTION #46 RO/#39 SRO:

Recommendation not accepted:

The answer key will reflect only one correct answer, that being answer "B."

The initial question drawn from the licensee exam bank and proposed by the NRC designated answer "B" as the correct answer. However, during the pre-examination review, the licensee stated that answer "B" was not correct due to a recent revision to Technical Specification 3.9.2 (Revision 3) and answer "C" was the correct answer. Based on this information the NRC modified the answer key to reflect "C" as the correct answer, prior to exam administration.

During the post examination comments the licensee recommended that answer "B" or "D" be accepted as the correct answer.

Answer "A" was clearly not the correct answer based upon the requirements of Technical Specification (TS) 3.9.2, Refueling Operations. TS 3.9.2 requires that two source range neutron flux monitors and one channel of audible count rate shall be operable. The licensee did not contest this answer choice.

The licensee identified that the answer key indicated that "C" was the correct answer. Identifying "C" as the correct answer was in error. Answer "C" could not be correct answer because the sequence of the answer had fuel movement continue before N-32 is selected on the audio count rate selector. That would be in violation of step 3.1, Precautions and Limitations, of licensee procedure FNP-1-UOP-4.1. Step 3.1 states, in part, "that at least two source range neutron monitors shall be operating, each with continuous visual indication in the control room, AND one channel of audible count rate in the control room or in containment...." Also, the requirements of TS 3.9.2 would not be met. The initial conditions stated in the stem of the question did not provide the necessary information to support distractor "C" as the correct answer. The answer key was corrected to reflect the original intent that answer "B" was the correct answer.

The licensee submitted that answer "D" also be accepted as a correct answer. The NRC concluded that answer "D" is not a correct answer. Answer selection "D" is the following: "Suspend all fuel movement, monitor the remaining NI channels, select Source Range channel N-32 on the audio count rate selector, continue fuel movement, and then repair N-31." Parts of answer "B" and "D" were identical and are correct actions. This included the first three elements of answers, "Suspend all fuel movements, monitor the remaining NI channels, and select Source Range channel N-32 on the audio count rate selector." However, answer "D" stated to continue fuel movement, and then repair N-31, where answer "B" stated to repair N-31 then continue fuel movement. To continue fuel movement, as specified in answer "D" would be a violation of TS 3.9.2, which requires two channels of source range neutron monitors be operable.

The licensee submitted information that suggested that the candidates may have assumed that the source range Gamma-Metrics post accident neutron flux monitor was in service and the requirements of TS 3.9.2 were met. That assumption would result in answer "D" as an additional correct answer.

The NRC concluded that assuming that the Gamma-Metrics was in service was not valid based upon the following: NUREG-1021, Revision 8, Supplement 1, Appendix E, Policies and Guidelines for Taking NRC Examinations, which was read and provided to each applicant prior to the examination. Item 7 of Part B, Written Examination Guidelines, states, in part, "if you have any questions concerning the intent or the initial conditions of a question, do not hesitate asking them before answering the question..... When answering a question, do not make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions..."

In this case, there was no mention of the Gamma-Metrics system in the stem of the question or in any part of the answer selections. It would not be logical to make any assumptions regarding the Gamma-Metrics system already being in service, being placed in service, or that it was a consequence of another conditions.

A Caution prior to step 2.8 of Licensee procedure FNP-UOP-4.1, "General Outage Operations Guidance,"states, in part, that the Gamma-Metrics source range channel may only be used as a back-up to N-31 or N-32 during certain core configurations. Core configurations were not identified or discussed in the stem of the question or any part of the answer selections. Also, Precaution 3.2 of the same procedure contained the same words as the above mentioned procedure Caution.

The licensee submitted Training Advisory Notice, "Use of the Gamma-Metrics Detectors as a Back-up to Source range Channel N-31 or N-32," as part of the justification that answer "D" was an additional correct answer. The training advisory notice identified that some caution must be used before taking advantage of using the Gamma-Metrics. The advisory stated, in part, "In order to use the Gamma-Metrics as a back-up, the core loading must be such that there are fuel assemblies forming a neutronic bridge to that detector so that the detector is able to respond to the core's neutron output." Again, there was no mention of specific core configuration in the stem of the question or in any part of the answer selections.

Since the stem of the question does not provide information concerning the Gama-Metrics instrumentation it can not be assumed it was available, permission was provided to use it or it was neutronically coupled to allow meaningful measurement.

QUESTION #59 RO/#55 SRO:

Recommendation not accepted:

The answer key will reflect only one correct answer, that being the original answer "B." FNP-0-SOP-0.8, "EMERGENCY RESPONSE PROCEDURE USER'S GUIDE," paragraph 3.1, Entry Conditions, states in part: "**There are two entry points to the ERP network.** The first is upon a reactor trip or safety injection occurs or is required. When this occurs the network is entered at step 1 of EEP-0, "REACTOR TRIP OR SAFETY INJECTION." The second is if a complete loss of AC power to the safeguards busses occurs. For this condition the network is entered at step 1 of ECP-0.0, LOSS OF ALL AC POWER.

Once the ERP network has been entered, the user is directed to other ERPs by transition steps.

Each ERP has its Purpose and Symptoms or Entry Conditions; listed on the first page. **This information is presented to help the user ensure that he has transitioned to the correct procedure**.

ECP 0.1 provides for three transition points; step 9 (and for the balance of the procedure in accordance with the caution prior to step 9) and step 20, both to ECP 0.2, "LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED" and step 22 to ESP 0.2, "NATURAL CIRCULATION COOLDOWN TO PREVENT REACTOR VESSEL HEAD STEAM VOIDING."

The stem of the question placed the operator at step 3 of ECP 0.1. Based on the procedure usage described in FNP-0-SOP-0.8, the earliest opportunity for the operator to exit ECP 0.1 was at step 9. This corresponds to answer B. Proceeding, as described in answer D, clearly violates procedure usage as described in FNP-0-SOP-0.8.

The question presents a sequence of events that uses procedures ECP-0.0, "Loss of All AC POWER," ECP-0.1, "LOSS of ALL AC POWER RECOVERY WITHOUT SI REQUIRED," and ECP-0.2, "LOSS of ALL AC POWER RECOVERY WITH SI REQUIRED." A caution prior to step 1 in ECP-0.1 states that: "IF an SI signal is actuated prior to performing step 9 of this procedure, THEN it should be reset to permit manual loading of SI equipment." Since the initial conditions of the question specify step 3 of ECP-0.1 as the starting point, step 1 and 2 have been completed. Step 2 requires the resetting of SI. The question states while performing step 3 a simultaneous loss of Vital Instrument bus and SI actuation have occurred. The caution prior to step 1 in ECP-0.1 is applicable for procedure steps 1 through 9. Once the SI is reset in ECP-0.1, the remaining procedure steps are completed up through procedure step 9 at which time verification of plant conditions, such as sub-cooling margin and pressurizer level to determine entry conditions for transition to ECP-0.2, is performed. If ECP-0.2 was immediately transitioned to from step 3 of ECP-0.1, then the ECP-0.1 procedure steps that verify plant conditions for the requirements of an SI would not be completed as when transitioning from either ECP-0.1 step 9 or ECP-0.0 step 29.

Procedure FNP-0-AP-6, "Procedure Adherence," Rev. 5, section 5.1, provides requirements for correct procedure level of usage and following steps in sequence. For Emergency Operating procedures the level of usage is "Continuous Use" and requires that steps be followed in sequence. In accordance with FNP-0-AP-6, steps 1 through 9 of procedure ECP-0.1 are expected to be completed prior to transitioning to ECP-0.2. Additionally, procedure FNP-0-SOP-0.8, Emergency Response Procedure Users Guide, Rev. 5, section 3, provides requirements for applying procedure notes and cautions. Specifically, the procedure user is required to read and understand the note or caution prior to performing the procedure steps. In this case, the procedure user is required to understand that the caution is applicable to steps 1 through 9 of procedure ECP-0.1 and requires that SI be reset and continue through step 9.

An immediate transition from step 3 of ECP-0.1 to ECP-0.2 would result in a failure to follow site procedures FNP-0-AP-6 and FNP-0-SOP-0.8. In conclusion, the NRC has determined the question will remain as initially graded.