Maine Yankee
RELIABLE ELECTRICITY FOR MAINE SINCE 1972

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August 11, 1988
MN-88-83 CDF-88-55

Mr. Robert M. Gallo, Chief
Operations Branch, DRS
UNITED STATES NUCLEAR REGULATORY COMMISSION
475 Allendale Road
King of Prussia PA 19406

Reference: (a) License No. DPR-36 (Docket No. 50-309)

Dear Mr. Gallo:

Enclosed are Maine Yankee's comments and supporting reference materials covering the Reactor Operator and Senior Reactor Operator written examinations administered at our facility on August 9, 1988.

I would like to bring to your attention the number of questions we feel require unreasonable memorization of Normal and Emergency Operating procedures. Maine Yankee training and operations practices discourage operations personnel from relying on their memory for plant operations, except for those emergency response actions required immediately to protect plant and personnel safety. We feel that requiring licensed operators to memorize the types of information indicated in the referenced questions jeopardizes this operations practice and can lead to a decreased level of plant safety.

I would like to express our gratitude for the professional manner in which all aspects of the examining process were conducted.

Sincerely,

MAINE YANKEE

Charles D. Frizzle
Vice President Operations

CDF/dls

Enclosure

c: Barry Norris, Chief Examiner

SECTION 1 - Principles of Nuclear Power Plant Operation, Thermodynamics, Heat Transfer and Fluid Flow

Question No.	Comments
1.01	No comment
1.02	The Maine Yankee (Technical Specifications) definition of "Shutdown Margin" is: 1. The reactivity by which the reactor is subcritical in its present condition, and 2. The reactivity associated with the withdrawn trippable CEA's less the reactivity associated with the highest worth withdrawn trippable CEA. Since CEA's may be withdrawn in hot standby, the candidate may make assumptions as to the actual amount by which the reactor is shutdown. These assumptions may result in different calculations than indicated on the answer key. It is recommended that the NRC change the words "Shutdown Margin (SDM)" in this question to "Margin to Criticality" to prevent potential problems if this question is used in the future.
1.03	Although the concept of using a 1/m plot during fuel loading to ensure criticality is <u>not</u> achieved is trained for theoretical purposes in licensed operator initial training, Maine Yankee licensed operators do not conduct such a plot. Testing of the 1/m concept should be restricted to its use during a reactor startup only. It is requested that the NRC revise this question prior to entry into their Maine Yankee exam bank.
1.04	NO COMMENT
1.05	NO COMMENT
1.06	NO COMMENT
1.07	This question is not operationally oriented in that it uses "backwards" logic, requiring an operator not to use the rod worth integral curves available to him to calculate reactivity addition, but rather to calculate reactivity added after the fact, based on an unrealistic constant differential rod worth and time (further requiring memorization of various group rod speeds). For future exams, Maine Yankee requests that the question be re-written to reflect actual operating conditions.

SECTION 1 (Continued)

1.08 Other "parameters on the primary plant affecting DNB which can be controlled by the reactor operator" include Tave and T_H. A decrease in either raise the DNBR. These should be added to the answer key and any four (of the six) be accepted for full credit.

1.09 NO COMMENT

1.10 NO COMMENT

1.11 It is unreasonable to expect the candidate to state "assume isenthalpic expansion (for 0.5 points partial credit) since this is trained as fact not assumption. The only true assumption which must be made is what Quench Tank Pressure will be in this condition. Full credit should be allowed for computing the correct temperature (allowing ± 10% for graph reading) for the assumed Quench Tank Pressure.

1.12 Since Maine Yankee has no electric driven variable speed pumps, the requirement to be able to calculate a new power requirement follwing pump speed change is unrealistic. Part (b) of this question should be removed from this exam and the question should be mouified prior to entry into the NRC exam bank.

SECTION 2 - Plant Design including Safety and Emergency Systems

Question No.	Comments
2.01	NO COMMENT
2.02	NO COMMENT
2.03	b. The EDG's are cooled by an internal cooling water system (chromated water) which is then cooled by PCC/SCC as mentioned in the answer key. The candidates may state that the EDG's are cooled by an internal cooling water system which should be accepted for full credit, (reference - System Description AS-12). d. During the pre-exam review the following additional answer was provided and should be included in the answer key, "push the stop buttons (de-energizes electric fuel pump) and shut the fuel shut off valve (to engine driven fuel pump)". Any 2 of the 3 conditions should be accepted for full credit, (reference Lesson Plan RO-L-5.4 attached).
2.04	NO COMMENT
2.05	NO COMMENT
2.06	NO COMMENT
2.07	There are at least seventeen (17) automatic responses which occur in the CVCS when an SIAS signal is generated. They are: 1. Standby charging pump starts (P-14A, B or S) 2. HSI-M-50 opens (charging pump suction from RWST) 3. HSI-M-51 opens (charging pump suction from RWST) 4. CH-M-87 closes (charging pump suction from VCT) 5. CH-M-1 closes (charging pump suction from VCT) 6. CH-A-32 closes (charging isolation) 7. CH-A-33 closes (charging isolation) 8. CH-F-38 closes (charging flow control valve) 9. CH-F-70 closes (fill header flow control valve) 10. LD-T-5 closes (letdown isolation valve) 11. LD-M-68 closes (letdown isolation valve) 12. SL-P-3 closes (seal H_2O to RCPs) 13. BA-A-32 closes (boric acid to blend tee) 14. CH-S-119 closes (charging suction vent) 15. CH-S-120 closes (charging suction vent) 16. Ch-S-121 closes (charging suction vent) 17. Ch-S-122 closes (charging suction vent) Other "responses" include modifying the trip circuit on the charging/HPSI pumps to prevent unwarranted trips. Any 6 of the above responses should be accepted for full credit. (Reference - Table NS-5-IV in Maine Yankee Systems Training Manual)

SECTION 2 (Continued)

Question No.	Comments
2.08	NO COMMENT
2.09	b. During preparations for RHR operations, a warm-up recirc is conducted per OP 1-13-1. The purpose of this recirc is includeu in Lesson Plan RO-L-2.7, page 11 (attached) as "equalize delta T between RHR and Coolant" This reason should be added to the two reasons listed in the answer key and any two of the three accepted for full credit.
2.10	c. This question involves an unreasonable memorization of Normal Operating Procedures and is not in conformance with NUREG-1021, ES-202, paragraph B.2 which states "the candidate should be familiar with the conditions that require the use of safety and emergency systems and why such protection is required, with emphasis on areas where a malfunction will require immediate operator action". Furthermore, paragraph B.4 states "the candidate is not expected to have normal procedures committed to memory, but should be able to explain reasons, cautions, and limitations of normal operating procedures". This question clearly requires knowledge from memory of a normal operating procedure involving a malfunction which does not require immediate operator action and should be deleted from the exam.
2.11	NO COMMENT

SECTION 3 - Instrument and Controls

Question No.	Comments
3.01	NO COMMNT
3.02	NO COMMENT
3.03	NO COMMENT
3.04	NO COMMENT
3.05	NO COMMENT
3.06	In the condition stated, the PORVs will also open if the candidate assumes the cooldown/depressurization has not reached the point of selecting VPSR. This occurs when two safety channels for pressure pressure fail high on a 2 out of 4 logic. This should be accounted for in question grading and addressed during entry of this question into the NRC exam bank. Reference - Maine Yankee System Description NS-5, page 19 - NS-12, pages 23 & 24
3.07	NO COMMENT
3.08	NO COMMENT
3.09	NO COMMENT
3.10	NO COMMENT
3.11	a. The answer to this question can be true or false depending upon the readers understanding of the words "three fission chambers". The wide range logarithmic channels each receive flux levels from "3 fission chamber detectors (3 clusters of 3 detectors each)" [quote from paragraph 2.1, page 5 of system description NS-10]. "When the fission chambers output reaches 1000 cps, two of the three chamber clusters outputs are removed" [quote from page 9 of NS-10]. During power operations, the wide range logarithmic channels receive flux level signals from one (1) fission chamber cluster consisting of three (3) fission chamber detectors. As we have requested in the past, this question should be deleted from the exam and the exam bank due to its confusing nature. Since the NRC answer key indicates that a "true" response is expected, it is assumed that the NRC wishes to test whether or not the candidate knows that there are three detectors per cluster. It is further recommeded that if the NRC feels that this knowledge is important to safe plant operation, then a more direct question be developed (e.g., True or False - There are 3 (three) fission chamber detectors per wide range logarithmic channel fission chamber cluster.

SECTION 4 - Procedures - Normal, Abnormal, Emergency and Radiological Control

Question No.	Comments
4.01	NO COMMENT
4.02	b. The original intent of this question expected the candidate to provide an answer requiring memorization of subsequent actions of AOP 2-11. During pre-exam review, the Chief Examiner agreed to modify the answer key to reflect knowledge of generic EOP entrance conditions as follows: 1. Plant trips (0.5) 2. SIAS occurs (0.5) 3. Loss of all AC (0.5) Reference: EOP Background Document Although this modification was made, the question wording was retained. As worded, the question relates specifically to AOP 2-11 and may not elicit the answer provided in the key. The examiner should allow reasonable answers which the candidate attempts to relate to AOP 2-11.
4.03	The answer provided requires stating "trip the reactor and turbine" for full credit. A 1/3 credit reduction for not stating "and the turbine" is unreasonable. Full credit should be allowed for "tripping the plant" or "tripping the reactor".
4.04	b. Part (b) of this question involves double jeopardy in that it cannot be answered correctly if part (a) is incorrectly answered. Answers to this question should be granted full credit if in fact "initial actions" exist which must be taken in the first minute following the cause listed as the answer to part (a). If no initial actions exist which must be taken in the first minute for the cause listed in part (a), then part (b) should be deleted from the exam.
4.05	NO COMMENT
4.06	NO COMMENT
4.07	NO COMMENT
4.08	b. This question has no one correct answer. The answer is YES - if the Reactor Operator is qualified as a Fire Brigade leader or NO - if the Reactor Operator is not qualified as a Fire Brigade leader. Five Brigade leader qualification is determined through training provided by the Maine Yankee Fire Protection Coordinator.
4.09	NO COMMENT
4.10	NO COMMENT

SECTION 4 (Continued)

4.11 During the pre-exam review the following answers were provided:

a. Yes (0.5) - If the proper proficiency watches have been stood in the last quarter (0.5)

or

NO (0.5) - If the proper proficiency watches have not been stood in the last quarter (0.5).

b. No (1.0) - Must be enrolled in an operator licensing course.

4.12 NO COMMENT

4.13 NO COMMENT

SECTION 5 - Theory of Nuclear Power Plant Operation, Fluids, and Thermodynamics

Question No.	Comments
5.01	NO COMMENT
5.02	a. See comment for #1.02. b. No actions are necessary immediately. The referenced Technical Specification is not applicable since the reactor is obviously not critical. Since you asked the question, I'm sure the candidates will provide the actions they would take. If one assumes the reactivity addition is unexplained (not mentioned in the question) and assuming a reactor startup was in progress (not mentioned in the question) then the only immediate action would be to stop the reactor startup and investigate the reactivity abnormality. The NRC should consider deleting the question.
5.03	See comments for #1.03.
5.04	NO COMMENT
5.05	NO COMMENT
5.06	NO COMMENT
5.07	a. See comments for #1.07. b. The answer key does not contain an answer for this question. Maine Yankee would provide the following answers. HOW - Startup rate would be more negative (0.5) WHY - Additional rate due to rate of change of reactivity affect on SUR (0.5)
5.08	See comments for #1.08
5.09	NO COMMENT
5.10	NO COMMENT
5.11	See comments for #1.11

SECTION 5 (Continued)

5.12 a. During the pre-exam review, it was noted that choice (2) "greater than 1.0 but less than 2.0" would be correct for this condition in all normal circumstances although depending on the shape of the specific pump and system curves (not provided) it might be possible for only choice (4) to be correct. It was requested and agreed to by the Chief Examiner to change choice (4) to "greater than 2.0" to make choice (2) the most correct answer. During the exam itself, the proctor told the candidates to change choice (4) back to "greater than 1.0". Maine Yankee feels that either choice (2) or (4) should be accepted as correct and that this question be modified to prevent future confusion.

SECTION 6 - Plant Systems Design, Control, and Instrumentation

Question No.	Comments
6.01	a.2. Due to the wording of this question, the candidates may take different approaches such as: 1. Describing how the valves function to achieve the purposes in Part 1 above (assumed in answer key). 2. Describing how these valves function as related to the purposes of the CVCS system (root statement of question) including automatic pressurizer level control. The examiner should allow any reasonable description of letdown valve operation (either independently or as part of the CVCS system) for full credit.
6.02	NO COMMENT
6.03	See comments for #2.03
6.04	Due to the wording of this question, the candidates may take different approaches such as: 1. Providing the "problem" that necessitated providing a hot leg injection path which could be operated if necessary outside a postulated high radiation environment (as assumed in the answer key). 2. Providing the "problem" that necessitated having a hot leg injection path at all (prevention of boron precipitation in the core during a cold leg LOCA). The examiner should allow either "problem" to be acceptable for full credit.
6.05	c.2. The EFW isolation valves can be opened following actuation of the low S/G pressure signal in any one of (3) three ways: 1. By placing the 3-position control switches in open (in answer key). 2. By taking control of the valve with the NORMAL/ALTERNATE switch at the alternate shutdown panel (reference - Systems Training Manual, chapter PGS-13, page 23- copy attached). 3. By taking both A and B train (keylock) bypass switches on the MCB for the affected S/G to bypass (reference - Systems Training Manual, chapter PGS-13, page 26- attached).

SECTION 6 (Continued)

6.06	See comments for #3.06
6.07	NO COMMENT
6.08	NO COMMENT
6.09	NO COMMENT
6.10	NO COMMENT

SECTION 7 - Procedures - Normal, Abnormal, Emergency and Radiological Control

Question No.	Comments
7.01	c.1 Question was changed during pre-exam review, therefore, the answer key parenthetical statement is not applicable.
7.02	See comments for #4.02
7.03	b. See comments for #4.03
7.04	b. See comments for #4.04b
7.05	NO COMMENT
7.06	NO COMMENT
7.07	This question requires memorization of the EOPs beyond that specified in paragraph A.3 of NUREG-1021, ES-402 and therefore, should be deleted from the exam.
7.08	NO COMMENT
7.09	This question requires memorization of an extremely infrequently conducted normal operating procedure and is clearly beyond the scope of examination specified in paragraph A.3 of NUREG-1021, ES-402 and therefore, should be deleted from the exam.
7.10	This question goes well beyond the scope of what should be required from memory by an SRO and that specified in paragraph A.3 of NUREG-1021, ES-402. This information is readily available in the control room and would additionally be reported by Health Physics personnel. The candidates should be responsible for knowing there are reporting criteria for radiological events as contained in Attachment E of M.Y. Operating procedure 1-26-1, which would be checked by shift personnel if any unusual occurance transpired. Health Physics personnel are required to notify the control room of any radiological incident for the requirements of potential NRC reporting per procedure 9.1.25 (attached). This question should be deleted from the exam.
7.11	a.2. The answer specified is only one of two possible answers. The more common answer and that trained in our radiation protection lesson is 25 REM (copy attached). This is also the value specified in the M.Y. Radiation Protection Manual (copy attached).

SECTION 8 - Administrative Procedures, Conditions, and Limitations

Question No.	Comments
8.01	a.2 See comments for #4.08b a.3 This question requires memorization of actions to be taken beyond the one-hour time frame normally considered within the scope of section 8 examining procedures.
8.02	A third answer of "the control room log book" should be included in the answer key since both watchstanders are required to review it prior to taking the watch and this is indicated by initialing the log. Reference OP 1-26-3, pages 2 & 3.
8.03	NO COMMENT
8.04	a. This question requires memorization of Technical Specifications beyond the scope of examination specified in paragraph A.4 of NUREG-1021, ES-402 which states "the candidate is not expected to memorize the exact details, numbers and surveillancce requirements contained therein". This question should be deleted from the exam. b. The above comment also applies to this question, however, the question should remain in the exam and full credit allowed if the candidate states that 3.25 times the allowed interval must be met.
8.05	NO COMMENT
8.06	NO COMMENT
8.07	If the reactor is assumed to be critical when this condition occurs the proper "immediate actions" would be to: 1. Take actions to return the plant to within the LCO - and - 2. bring the reactor subcritical. If the reactor is assumed to be subcritical then the only "immediate action" would be to take action to return the plant to within the LCO. The performance of an engineering analysis prior to power restoration is a condition for restart and not an immediate action.
8.08	NO COMMENT
8.09	NO COMMENT

SECTION 8 (Continued)

8.10 The detailed answer in the answer key is not elicited by the question.

"To ensure a return to criticality does not occur following a MSLB" or similar response should be accepted for full credit.

The candidate should not be required to memorize all safety analysis assumptions.

8.11 NO COMMENT

8.12 NO COMMENT

8.13 See comment for #4.11.

ATTACHMENT 4

NRC RESPONSE TO FACILITY COMMENTS

RO EXAMINATION

Question Number	Comment
1.02	Noted
1.03	Noted
1.07	Noted. However, the use of a constant differential rod worth is for ease of calculation and memorization of rod speed is not inappropriate.
1.08	Not accepted. The parameters suggested by the comment are already included in the answer key.
1.11	Accepted. The points associated with each item represent the partial credit to be deducted if wrong information is used in the candidate's answer.
1.12	Not accepted. During the pre-examination review, the training department representative stated that Maine Yankee does have some variable speed electric driven pumps. Additionally, it should be noted that with the advent of the generic fundamentals examinations, the question is appropriate.
2.03.b	Not accepted. Without FCC or SCC, the EDGs will overheat.
2.07	Accepted.
2.09.b	Accepted.
2.10.c	Not accepted. Within the normal operating procedure, there is a section titled "RCP Operation Under Off-Normal Conditions." Additionally, if the noted conditions cannot be maintained, a reactor shutdown is required.
3.06	Accepted.
3.11.a	Accepted. Question deleted.
4.02.b	Accepted.
4.03	Accepted.

NRC RESPONSE TO FACILITY COMMENTS

RO EXAMINATION (continued)

Question Number	Comment
4.04.b	Not accepted. Parts a and b do not represent double jeopardy. Even if the cause is not know, the indications provided (loss of main feed flow and potential loss of RCP seal water) necessitate the required actions.
4.08.b	Accepted.
4.11.a	Accepted.
b	Accepted.

SRO EXAMINATION

Question Number	Comment
5.02.a	See 1.02.
5.02.b	Accepted.
5.03	See 1.03.
5.07.a	See 1.07.
b	Accepted.
5.08	See 1.08.
5.11	See 1.11.
5.12.a	Not accepted. The question, as originally stated, was acceptable in that only one answer was correct in all cases. As modified, no single answer was correct in all cases, although either of two answers could be correct under specific conditions.
6.01.a.2	Accepted.
6.03	See 2.03.
6.04.b	Not accepted. The recent installation of HSI-331/332 was specifically to facilitate operation of the system in an accident condition.
6.05.c.2	Accepted.

NRC RESPONSE TO FACILITY COMMENTS

SRO EXAMINATION (continued)

Question Number	Comment
6.06	See 3.06.
7.01.c.1	Accepted.
7.02.b	See 4.02.b.
7.03.b	See 4.03.
7.04.b	See 4.04.b.
7.07	Not accepted. ES-402, paragraph A.3, states that "... a candidate must demonstrate complete knowledge and understanding of the symptoms, automatic actions, and immediate action steps specified by offnormal or emergency operating procedures." As a transition to the FRPs is required when the symptoms of inadequate heat sink occur, the question is within the scope of ES-402.
7.09	Not accepted. ES-402, paragraph A.3, states that "... the candidate should be able to describe generally the objectives and methods used in the normal ... procedures." As the objective of this procedure is to mitigate the containment airborne activity during refueling, and the question asks for a general description of the methods used, the question is within the scope of ES-402.
7.10	Not accepted. ES-4-2, paragraph A.3, states that "... the candidate should be familiar with the provisions of 10CFR20." The ability to recognize those situations requiring immediate NRC notification per 10CFR20.403 is within the scope of ES-402.
7.11.a.2	Not accepted. The Emergency Plan (procedure 2.50.14, page 11) discriminates between the situations for exposures of 12.5 rem and 25 rem.
8.01.a.2	See 4.08.b.
a.3.	Noted. However, the question is deemed appropriate. Although there is a two hour limit, action must be initiated immediately to fill the vacant position.
8.02	Accepted.

NRC RESPONSE TO FACILITY COMMENTS

SRO EXAMINATION (continued)

Question Number	Comment
8.04.a	Partially accepted. The memorization of exact numbers is beyond the scope of ES-402; however, the question has been retained to test the knowledge that the next surveillance is due six months following the previous one.
b	Partially accepted. The memorization of exact numbers is beyond the scope of ES-402; however, full credit will be allowed if the candidate understands the concept that 3.25 times the allowed interval over the last three tests is more restrictive that 1.25 times the interval.
8.07	Accepted.
8.10	Not accepted. ES-402, paragraph A.4, states that "... questions concerning the technical specifications will require a thorough knowledge of what items are addressed in ... the basis for the requirements ..." Accordingly, this question is within the scope of ES-402.
8.13	See 8.11.

ATTACHMENT 5

SIMULATION FACILITY FIDELITY REPORT

Facility Licensee:	Maine Yankee Atomic Power Company 83 Edison Drive Augusta, Maine 04336
Facility Licensee Docket No.:	50-309
Facility Licensee No.:	Maine Yankee Atomic Power Company
Operating Tests administered at:	Maine Yankee Simulator Wiscasset, Maine
Operating Tests Given On:	August 10-11, 1988

The Maine Yankee simulator closely parallels the plant from the human factors concept. However, during the conduct of the simulator portion of the operating tests identified above, one deficiency was noted in that the simulator does not have the ability to override the auto start feature of individual pumps (example, safety injection or charging pumps). By not having this ability, they are not able to test the ability of the operators to verify the actuation of the all emergency core cooling equipment when implementing the immediate action steps of the EOPs.