U.S. NUCLEAR REGULATORY COMMISSION REGION I OPERATOR LICENSING REQUALIFICATION PROGRAM EVALUATION REPORT

| REQUALIFICATION PROGRAM | EVALUATION REPORT NO. 50-213/89-06(OL-RQ) |
|-------------------------|---|
| FACILITY DOCKET NO.: | 50-213 |
| FACILITY LICENSE NO. | DPR-61 |
| LICENSEE: | Connecticut Yankee Atomic Power Company P. O. Box 270 Hartford, Connecticut 06141 |
| FACILITY: | Haddam Neck Power Plant |

EXAMINATION DATES:

May 1-5, 1989

CHIEF EXAMINER:

Opurations Engineer issett, Senior

APPROVED BY:

Peter Eselgroth, Chief, PWR Section Operations Branch, Division of Reactor Safety

SUMMARY: The licensed operator requalification training program was rated as satisfactory. Written regualification examinations and operating tests were administered to eight senior reactor operators (SROs) and four reactor operators (ROs). The examinations were graded concurrently and independently by the NRC and the facility training staff. As graded by the NRC, one RO failed the witten examination. The remaining SROs and ROs passed all portions of the examination. As graded by the facility, one SRO failed the simulator examination, one SRO failed the Job-Performance-Measures examination, and one RO (the same RO as identified by the NRC) failed the written examination. The remaining 9 operators passed all portions of the examination. Also, both the NRC and the facility evaluators judged all three crews as satisfactory during the performance of the simulator scenarios.

The NRC also identified one facility evaluator as performing his assigned responsibilities unsatisfactorily.

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DETAILS

TYPE OF EXAMINATIONS:

Requalification

EXAMINATION RESULTS:

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| NRC Grading | RO Pass/Fail | SRO Pass/Fail | TOTAL Pass/Fail |
|----------------|--------------------|--------------------|--------------------|
| Written | 3/1 | 8/0 | 11/1 |
| Simulator | 4/0 | 8/0 | 12/0 |
| Walk-through | 4/0 | 8/0 | 12/0 |
| Overall | 3/1 | 8/0 | 11/1 |

| RO Pass/Fail | SRO Pass/Fail | TOTAL Pass/Fail | |
|-----------------|--------------------------------|---|--|
| 3/1 | 8/0 | 11/1 | |
| 4/0 | 7/1 | 11/1 | |
| 4/0 | 7/1 | 11/1 | |
| 3/1 | 6/2 | 9/3 | |
| | Pass/Fail 3/1 4/0 4/0 | Pass/Fail Pass/Fail 3/1 8/0 4/0 7/1 4/0 7/1 | |

1.0 PERSONNEL CONTACTED DURING THE EXAMINATION/EVALUATION

CHIEF EXAMINER AT SITE:

P. Bissett, Senior Operations Engineer

(1, 2, 3, 4)

OTHER NRC PERSONNEL:

| Α. | Asars, Resident Inspector | (4) |
|----|--------------------------------------|-----|
| | Eselgroth, Chief, PWR Section | (3) |
| | Gallo, Chief, Operations Branch, DRS | (3) |

(3)

OTHER NRC PERSONNEL (Cont'd.):

| С. | Casto, | Chief (Acting), | PWR | Section, | R:II | (1,2) |
|----|--------|-----------------|-----|----------|------|-------|
| Α. | Lopez, | (INEL) | | | | (1,2) |
| R. | Warner | , (INEL) | | | | (1.2) |

CONNECTICUT YANKEE ATOMIC POWER COMPANY PERSONNEL:

| J. | Black, Director, Nuclear Training | (4) |
|----|--|--------------|
| G. | Bouchard, CY Unit Superintendent | (2,4) |
| Μ. | Bray, Assistant Supervisor Operator Training | (1, 2, 4) |
| R. | Heidecker, Training Supervisor | (1, 2, 3, 4) |
| Μ. | Ewers, SRO Licensed Instructor | (1,2) |
| J. | Rein, Requalification Program Coordinator | (1,2) |
| R. | Tourville, Assistant Operations Supervisor | (2) |
| Ν. | Young, Senior Training Instructor | (1,2) |
| G. | Waig, Training Instructor | (2) |

LEGEND:

- (1) Participated in examination development
- (2) Participated in examination administration
- (3) Attended entrance meeting on March 9, 1989 at King of Prussia, Pa.
- (4) Attended exit meeting on May 5, 1989 at the Northeast Utilities Training Center

2.0 PROGRAM EVALUATION RESULTS

Overall rating: Satisfactory

The program for licensed operator requalification training at Haddam Neck was rated as satisfactory in accordance with the criteria established in the above draft revision of NUREG-1021, ES-601. Those criteria are:

a. A pass/fail decision agreement between the NRC and facility grading of 90% for the written and operating examinations, with the licensee not being penalized for holding a higher standard of operator performance.

NRC grading resulted in eleven operators passing the written examination. Facility grading also resulted in eleven operators passing the written examination. This satisfies criterion a.

NRC grading resulted in twelve operators passing the operating examination. Facility grading resulted in ten operators passing the operating examination. One operator failed the simulator portion of the examination and one operator failed the Job Performance Measures (JPMs) portion of the examination. This also satisfies criterion a. b. At least 75% of all operators pass the examination.

NRC grading is the only consideration for this criterion. Eleven of 12 operators passed the examination overall. This satisfies criterion b.

c. Failure of no more than one crew during the simulator portion of the operating examination.

Again, NRC grading is the only consideration for this criterion. Three crews were evaluated and all three crews passed the simulator portion of the operating examination. This satisfies criterion c.

3.0 SCENARIO EVALUATION

The following was noted during the scenario portion of the operating examinations.

A generic weakness was noted during the performance of simulator scenarios in that communications between the SROs and ROs were not always closed loop. The SROs were primarily identified in failing to close the communication loop in the majority of cases.

Another communication weakness identified throughout several scenarios observed involved the announcement of transition from one emergency operating procedure (EOP) to another EOP. The SROs were identified in many instances of not informing all crew personnel of this transition.

4.0 WRITTEN EXAMINATION EVALUATION

The following is a summary of generic deficiencies noted from the grading of the written examinations. This information is being provided to aid the licensee in upgrading licensed operator and operator requalification training programs. No licensee response is required.

PART A

| Question No. | Comment |
|-------------------------|---|
| 1.0012(9) 1.0014(9a) | The ability to identify controlling signals to the feedwater regulating control valves and the effects thereof. |
| 1.0003(6) | The ability to explain, in detail, the effects of 1.0014(6a) changes in main steam pressure. |
| 1.0013(6) 1.0003(6a) | The effects of changes in various parameters on the variable low pressure reactor trip setpoint. |
| 1.0008(6) 1.0019(6a) | The ability to correctly identify transi on steps within various emergency operating procedures. |

PART B

| Question No. | Comment |
|--|--|
| 1.009(RO) | The ability to correctly identify actions to be taken in the event cf reactor protection system failures. |
| 1.0014(RO) 1.0014(SRO) 1.0017(RO) 1.0017(SRO) | Emergency Operating Procedures rules of usage. |
| 1 0002(RC) 1.0002(SRO) | The effects of various changes to calorimetric inputs |

5.0 JOB PERFORMANCE MEASURES (JPM) EVALUATION

One facility evaluator was identified as unsatisfactory in his evaluation of operators during their performance of JPMs. This unsatisfactory evaluation was attributable to the following.

- Both verbal and non verbal cues were excessive.
- Lacked professionalism.
- Did not document additional questions asked of the operators.
- Did not correct inadequate performance even after having been identified and communicated by the NRC examiner.

The licensee acknowledged the above comments and stated that the individual would be informed of his identified deficiencies and that necessary corrective actions would be taken to resolve these problems prior to his resuming evaluator duties.

A generic deficiency was noted during the performance of JPMs performed on the simulator. Several individuals, as noted by the licensee and the NRC, experienced some difficulty in performing selected JPMs, especially one dealing with a segment of an Emergency Operating Procedure (EOP). Several operators failed this particular JPM because they tended to place more emphasis on the rapid completion of the JPM rather the actual procedural steps involved. As a consequence, some steps were missed or were incorrectly performed. This was also identified as being the first time that JPMs were performed on the simulator. The licensee felt that this may have contributed to the problem. The NRC examiner was informed that JPM training utilizing the simulator would become a routine part of any future training.

Another JPM caused difficulty in satisfactory completion by several operators due to the fact that it was not valid in some respects. By procedure, this JPM could be satisfactorily completed without the operator fully completing all of the steps detailed within the JPM. All JPMs are expected to be validated against current plant procedures prior to their use.

6.0 SUMMARY OF COMMENTS MADE AT EXIT MEETING ON FEBRUARY 10, 1989

- a. The NRC expressed appreciation for the level of effort expended by the training department representatives in accommodating the NRC examination team. This level of effort, which included providing an adequate working area, appropriate reference materials, locked storage capabilities, plant access badging, etc., helped in expediting the review process and the conduct of the exam. Appreciation was also expressed for the cooperation and level of effort expended by all those involved in the process, especially the facility team members who administered the examination.
- b. The NRC discussed the topics addressed in Paragraphs 2 thru 5 above.
- c. During the performance of in-plant JPMs, several delays were encountered as a result of any one particular JPM not being completed in the time frame expected. It was becommended that during the performance of JPMs, that a coordinator be assigned whose primary responsibility would be to track and adjust the JPM schedule as necessary to keep the process moving, thus avoiding unnecessary delays.
- d. The licensee needs to apply Quality Control examination techniques to JPM questions in much the same manner that QC techniques were applied during the written exam review performed by the NRC during the exam preparation review week. Also, the JPMs should be reviewed in more detail as far as identification of critical tasks are concerned.
- e. Although not discussed at the exit meeting, the reference material supplied by the licensee to the NRC for examination preparation was more than adequate. All material was well indexed and tabbed which allowed rapid access to specific topics and component information.
- 7.0 There were minor changes made to the written examination answer keys after they were administered to the operators. Those changes as a result of further research have been made to the examinations attached to this report.

Attachments:

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- 1. Simulator Examinations (cover sheets only)
- 2. Job Performance Measures (cover sheets only)
- 3. Written Examination and Answer Keys (RO & SRO)
- Connecticut Yankee Atomic Power Company Letter (D. B. Miller to R. M. Gallo) Dated June 5, 1989

CONNECTICUT YANKEE SIMULATOR SCENARIO SUMMARY CY-OP-LORT-S010

| EVENT # | TIME | MALF | DESCRIPTION |
|---------|------|-------------------------------|---|
| 1. | +5 | CHR15 | Change wind speed to 75 mph up to 90 mph over next 5 minutes. |
| 2. | +10 | EDOLA | Loss of the 1772 line |
| 3. | +20 | SWR 33, 34, 35 & 36 Closed | Loss of all Service Water |
| | +20 | C, C,D 100% severity | Condenser tube sheet 50% blocked. |
| 4. | +32 | EDO1B | Loss of 1206 Line (Black out) |

PROCEDURES USED DURING SCENARIO

| 1. | AOP 3.2-5 | Natural Disasters |
|----|--------------|--------------------------|
| 2. | EPIP 1.5-1 | Emergency Assessment |
| 3. | ACP 1.2-16.1 | Plant Information Report |
| 4. | E-0 | Rx trip or SI |
| 5. | ES-01 | Rx trip response |
| 6. | | Natural Circ Cooldown |
| | ECA 0.0 | tration Black out |
| 8. | 10 | Loss of Service Water |
| | | |

CONNECTICUT YANKEE SIMULATOR SCENARIO SUMMARY CY-OP-LOCT-87-AES014

| | | MALF | DESCRIPTION |
|--------|--------------|------------------------------------|--|
| VENT # | TIME | L.R.PFTF | |
| | +5 | RX09A @ 100% | #1 Feed Water Hagan Xmitter |
| • | | Fails high | |
| ı. | +15 | FWR01 @ 1-1.5% | Vacuum bkr 1-1.5% open |
| 3. | +~25 | RD08 | Continuous Rod inserted inserted during load reduction as manual rod motion is |
| | | | occurring. |
| 4. | +35 | FWR01 10% | Loss of vacuum Rx trip |
| 1. | AOP 3.2-18 | Loss of Feedwat regulator valve | er (FW) Flow, Feedwater (FW) failure |
| | | regulator valve | Main Condenser Vacuum |
| 2. | AOP 3.2-33 | | |
| 3. | AOP 3.2-23 | Malfunction of | Rod Control System |
| 4. | T.S. Sec 3.9 | System | fety Instrumentation and Control |
| 5. | NOP 2.2-1 | Changing Plant | Load |
| 6. | ODI #124 | | ine steam cycle air Inleakage |
| 7. | E0 | FX Trip or saf | ety injection |
| 8. | ES-0.1 | RX Trip respon | |
| | EOP 3.1-8 | Complete Loss | of Condenser Vacuum |
| | | | |

CONNECTICUT YANKEE SIMULATOR SCENARIO SUMMARY CY-OP-LOCT-87-AES001

| | | | EVENT DESCRIPTION | |
|---------|--------|--------|--|--|
| EVENT # | TIME | MALF | | |
| | 0 | | IC#6 25% Power with xenon | |
| 1. 0 | U | | increasing | |
| | +5 | RD0132 | Dropped rod #31 | |
| | +35-10 | MSOID | MSLB Inside Containment, 100% severity with no ramp | |
| | | | | |

PROCEDURES USED DURING SCENARIO

AOP 3.2-23 Failure of Rod Control System

E-O, Reactor Trip or Safety Injection

E-2, Faulted Steam Generator Isolation

E-1, Loss of Reactor or Secondary Coolant

ES-1.1, SI Termination

CONNECTICUT YANKEE SIMULATOR SCENARIO SUMMARY CY-OP-LORT-S015

1

| EVENT # | TIME | MALF | DESCRIPTION | |
|----------------|------|---------------------|--------------------------|--|
| <u>EVENI #</u> | +3 | RC07 @ 5% severity | Rx vessel head vent leak | |
| 2. | +25 | RC06 @ 10% severity | RCS Surge line rupture. | |
| 3. | +35 | SG02D @ 100% | #4 S/G tube rupture. | |

PROCEDURES USED DURING SCENARIC

| 1. 2. 3. 4. 5. 6. 7. 8. 9. | AOP 3.2-31 Tech Specs EPIP 1.5-1 ACP 1.2-16.1 NOP 2.2-1 E-0 E-1 ES-1.2 E-3 | Reactor Coolant System Leak 3.1.4 Primary System Leakage Emergency Assessment Plant Information Report Changing Plant load Rx trip or SI. Loss of Rx or secondary coolant Post loca cooldown and depressurization Steam Generator tube rupture SGTR with loss of Rx coolant subcooled recovery |
|--|--|---|
| 10. | ECA 3.1 | desired. |

Attachment 2

JOB PERFORMANCE MEASURE WORKSHEET

| Facility: CONN YANKEE | Examinee: |
|-------------------------------|-------------------------------------|
| JPM Number:35 | Time to complete: <u>15</u> minutes |
| Task Title: Calculate QPTR | |
| Task No. (CY) 002-103-01-01 | |
| Task No. (K/S) 015-000-A1.04 | K/A No. 3.5/3.7 |
| Applicable methods of testing | 2: |
| Simulate performance | Actual performance |
| Classroom | Simulator Plant |

* READ TO THE OPERATOR *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

- Initial Conditions: The plant is operating at 100% power, all systems operating normally and in automatic. No equipment is out of service, no major evolutions planned.
- Task Standards: Successfully and in a timely manner, calculate the core QPTR using the Excore Method in accordance with SUR 5.3-40.

Required Materials: Calculator, SUR 5.3-40, Core Data Reference Book.

Initiating Cues: The Reactor Engineering Department has just completed an incore flux map and incore QPTR calculation. The duty engineer has requested that you, as the Primary Side C.O., perform an excore QPTR calculation to verify their results.

| Facility: Connecticut Yankee | Examinee: |
|---------------------------------|----------------------------------|
| JPM Number: 48 | Time to complete: minutes |
| Task Title: Perform Process Rad | Monitoring Instrument Functional |
| Task No. (CY) 073-001-02-01 | |
| TASK NO. (K/S) 072-000-A4.02 | K/A No. 3.7/3.7 |
| Applicable methods of testing: | |
| Simulate performance | Actual performance |
| Classroom Simulato | or Plant |

* READ TO THE OPERATOR *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: Mode 1, 100% power, all system operating normally and in automatic.

Task Standards: Successfully perform the daily Rad Monitoring Operator's Check (SUR 5.1-11) for R-14A, R-31, and CD-1.

Required Materials: None

Initiating Cues: You are the 00-08 shift primary side C.O. You have just completed logs and now must perform the Daily Rad Monitoring Checks for R-14A, R-31, and CD-1. No radiation releases are in progress.

| Facility: CONNECTICUT YA | NKEE Examinee: | | |
|---------------------------|-------------------|----------------------|---------|
| JPM Number: 123 | Time to | complete: 15 | minutes |
| Task Title: Isolate a St | team Generator Lo | ocally | |
| Task No 400-517-05-01 | | | |
| Task No. (K/S) 035-010-A | 4.06 K/A No | 4.5/4.6 | |
| Applicable methods of tes | sting: | | |
| Simulate performance | x | Actual performance _ | |
| Classroom | Simulator | Plant | x |

* READ TO THE OPERATOR *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

itial Conditions: Reactor plant has tripped from 100%, safety injection signal has occurred, a steam-line break inside containment from #2 SG has been identified. #2 MSIV, #2 feed line MOV and #2 FRV bypass valves are shut.

Task Standards: Within the appropriate time requirements be able to locally isolate the #2 Steam Generator per E-2.

Required Materials:

Initiating Cues: Hand operator the "Valves required to isolate a faulted steam generator" page from E-2 and inform that he must locally isolate #2 Steam Generator.

| Facility: Connecticut Y | ankee Examinee: | |
|--------------------------|------------------------------|---------|
| JPM Number: 56 | Time to complete:15 | minutes |
| Task Title: Dump Steam | through the Atmospheric Dump | |
| Task No. 039-008-01-01 | | |
| Task No. (K/S) 000-055 | EA 2.01 K/A NO. 3.4/3.7 | • |
| Applicable methods of te | sting: | |
| Simulate performance | X Actual performance | |
| Classroom | Simulator Plant | X |

* READ TO THE OPERATOR *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: Station blackout in progress (plant formerly running normally at 100% power).

Task Standards: Atmospheric Steam dump is locally manually operated to the full open position.

Required Materials: CY key, Operator Aid #88-11, Appropriate Wrenches (2), N, Bottle.

Initiating Cues: Control room has directed operator to locally manually open the Atmospheric Steam Dump.

Facility: CONNECTICUT YANKEE

Examinee:

JPM Number: 4 Time to complete: 20 minutes

Task Title: Borate RCS Locally at MCC-8 Task No. 401-106-04-01 Task No. (K/S) 000-068EA 1.08 K

K/A No. 4.2/4.2

Applicable methods of testing:

| Simulate performance | X | Actual | performanc | e |
|----------------------|-----------|--------|------------|---|
| Classroom | Simulator | | Plant | x |

* READ TO THE OPERATOR *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: Control Room evacuated, you have been directed by the SS to borate the RCS at MCC-8 as per AOP 3.2-8 step 4.8.

Task Standards: Perform steps 4.8.1 through 4.8.9 of AOP 3.2-8 borate RCS - OPS outside Control Room.

Required Materials: AOP 3.2-8, fuse puller, goggles/face shield, rubber gloves.

Initiating Cues: Per direction of SS.

USE AOP 3-2-8

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Page 1 of 6

| Facility: CONNECTICUT YAN | IKEE | Examinee: | | |
|----------------------------|----------------|-------------|---------|---------|
| JPM Number: 2 | Time to com | plete: | 151 | minutes |
| Task Title: Manual Start | EDG & Energize | Eus 9 | | |
| Task No. (CY) 401-403-04- | -01 | | | |
| Task No. (K/S) 000-068-EA | 1.31 | K/A No. | 3.9/4.0 | |
| Applicable methods of test | ing: | | | |
| Simulate performance | x | Actual perf | ormance | |

Classroom Simulator Plant X

* READ TO THE OPERATOR *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: Mode 3, Reactor & Turbine tripped, Control Room evacuated, you are assigned to proceed with step 4.5 AOP 3.2-8.

Task Standards: Locate appropriate panels/switches using AOP 3.2-8 and start EDG2B and energize Bus 9.

Required Materials: Locked valve key.

Initiating Cues: You are assigned to perform EDG startup per AOP 3.2-8. There is another operator in switchgear aligning 480V buses per AOP 3.2-8 steps 4.5.5 thru 4.5.10.

| Facility: Connecticut Yanke | ee Examinee: |
|------------------------------|---------------------------|
| JPM Number: 33 | Time to complete: minutes |
| Task Title: Operate the CVC | IS to Makeup To The RWST |
| Task No. (CY) 004-34-01-01 | 1 |
| Task No. (K/S) 004-020-A2.(| K/A NO. |
| Applicable methods of testin | <u>ng</u> : |
| Simulate performance | Actual performance |
| Classroom Sin | nulator Plant |

* READ TO THE OPERATOR *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

- Initial Conditions: The plant is operating at 100% power, all systems operating normally and in automatic. The boric acid mix tank concentration is 17,350 ppm boron.
- Task Standards: Successfully and in a timely manner calculate the required blender ratio to makeup to the RWST, and perform a blended makeup to the RWST.

Required Materials: Calculator, NOP 2.6-3

General References: NOP 2.6-3

Initiating Cues: RWST level is 240,000 gallons. The SCO has just requested that you, the Primary Side Co, makeup to the RWST to restore level to 248,000 gallons. A recent chemistry sample of the RWST shows boron concentration to be 2600 ppm.

| Facility: | CONNECTICU | T YANKEE | E: | xaminee: | |
|-------------|-------------|--------------|-------------|----------|-----------|
| JPM Number: | 94 | Time | to complete | e: 15 | _ minutes |
| Task Title: | Perform | Swapover fro | m Injection | to Reci | rculation |
| Task No. | 006 102-05- | 01 | | | |
| Task No. (1 | K∕S) 000-0 | 11-EA1-11 | | K/A No. | 4.2/4.2 |
| | | | | | |

Applicable methods of testing:

1

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| Simulate | performance | | Actual | performance | |
|-----------|-------------|-----------|--------|-------------|--|
| Classroom | 1 | Simulator | x | Plant | |

* READ TO THE OPERATOR *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: Mode 1, 100% power EOL

Task Standards: Properly implement ES1.3 transfer to RHR Recirculation.

Required Materials: CY Simulator, Copy of EOP Book

Initiating Cues: The plant has experienced a large break LOCA from 100% power. The operators enter E-O then transfer to E-1. While conducting E-1, the RWST level decreases to 130,000 gallons. The operators transfer to ES-1.3, containment pressure is 32 psig.

| Facility: Conn Yankee | Examinee: | | | | |
|-------------------------------|-------------------------------------|--|--|--|--|
| JPM Number: 121 | Time to complete: <u>12</u> minutes | | | | |
| Task Title: Shutdown of EDG | After SI | | | | |
| Task No. 064-006-01-01 | Task No. 064-006-01-01 | | | | |
| Task No. (K/S) 054-000-A4.05 | K/A NO. 3.1/3.2 | | | | |
| Applicable methods of testing | 1: | | | | |
| Simulate performance | Actual performance | | | | |
| Classroom Simu | ulator Plant | | | | |
| | | | | | |

* READ TO THE OPERATOR *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

- Initial Conditions: The plant experienced a Safety Injection due to a Feed Reg Valve failing open upon unit trip. Normal station service is available and all systems responded normally.
- Task Standards: Locates all controls and indications. Shutdown and returns EG2A to standby condition in accordance with ES-1.1.

Required Materials: ES-1.1, Procedure to Shutdown a Diesel when not phased to its bus.

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Initiating Cues: The SCO has used the EOP network and is presently in ES-1.1 at step 22b. with SI reset. You are directed to shutdown EG2A in accordance with the opposite page.

| Facility: CONN YANKEE | Examine | e: | | |
|-----------------------------|---------|-----------|-------------|---------|
| JPM Number: 24 | Time to | complete: | 15 | minutes |
| Task Title: START A RCP | | | | |
| Task No. (CY) 003-001-01-01 | | | | |
| Task No. (K/S) 003-000-A14 | | K/A No. | 4.0/3.9 | |
| Applicable methods of testi | ng: | | | |
| Simulate performance X | | Actual | performance | |
| Classroom Si | mulator | | Plant _ | X |

* READ TO THE OPERATOR *

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

Initial Conditions: Mode 3, RCS temp>465°.

Task Standards: Start #3 RCP per NOP 2.4-2.

Required Materials: NOP 2.4-2

Initiating Cues: The SCO directs you to start #3 RCP.

Attachment 3

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : LORT - RO Examination Category : 1

| Examinee : | Final Grade : |
|----------------------------------|---------------|
| Examination Number : RO : 890011 | Developed : |
| Date Administered : 05/01/89 | Approved : |

Instructions to the Examinee :

*

- 1. Talking during the examination is strictly forbidden.
- If a question is not understood, raise your hand so that a proctor/examiner may assist you.
- All required reference materials will be provided by the proctor/examiner.
- Cheating in any form may result in a recommendation for disciplinary action.
- Each examination response sheet shall be numbered by you. You shall write your name or initials on each examination response sheet.
- 6. The passing grade requires a final grade of at least 80%.
- 7. The total duration of this examination shall be 2.00 hours.

All work done on this examination is my own; I have neither given nor received aid.

Student's Signature

ATTACHMENT 1

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : LORT - RO

Examination Number : RO : 890011 Date Administered : 05/01/89

WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT - RO 05/01/89

Ques # / Pts Question

Page

4

Exam # : RO : 890011

- 1.0001 / 2.4 The plant tripped one hour ago from an extended 100% power run. All recovery operations were normal except that when restarting #3 RCP, it tripped on an electrical fault. This is under investigation and the loop stop valve was re-opened. Data is 200 EFPD, Tavg = 535 degrees, the process computer is not available and boron concentration is 840 ppm. Use SUR 5.3-19 to determine if adequate shutdown margin is being maintained. Complete all required data sheets.
- 1.0002 / 1.9 The Reactor Engineer calculates core thermal power using a heat balance but neglects the effects of RCP horsepower and of S/G blowdown being in service. How will the calculated value be affected?
 - a. Both effects make the calculated value higher than the actual core thermal power.
 - b. Both effects make the calculated value lower than the actual core thermal power.
 - c. Neglecting RCPs makes the calculated value higher; neglecting blowdown makes it lower.
 - d. Neglecting RCPs makes the calculated value lower; neglecting blowdown makes it higher.
- 1.0003 / 2.2 The plant is at 30% power after being shutdown for RCP seal replacement for 20 days. Prior to shutdown, power level was at 100% for 68 days. Which of the following power ascension guidelines would be used for these conditions?
 - a. 30% to 100% 3%/hour
 - b. 30% to 80% 10%/hour 80% to 100% 3%/hour
 - c. 30% to 80% 15%/hour 80% to 100% 10%/hour
 - d. 1% hour

2 WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT - RO 05/01/89

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Exam # : RO : 890011 Ques # / Pts Question A control room operator is returning from a special assignment 1.0004 / 1.4 which removed him from his watchstanding duties for a period of six and one-half months. Which one of the following best describes the action(s) necessary for the operator to relieve the watch? a. Read and sign the turnover sheet, review the previous days Control Room log, and walkdown the main control board prior to relieving the watch. b. Read and sign the turnover sheet, review the control room logs back to the last watch stood, and walkdown the main control prior to relieving the watch. Stand 40 hours of watch under instruction, have a letter from C. the Station Superintendent reinstating the operator's license to an "Active" status and then conducting a shift turnover. The turnover includes reviewing the Control Room log back to the last watch, read and sign the turnover sheet, walkdown the main control board prior to relieving the watch. Have a letter from the Station Superintendent reinstating the d. operator's license to an "Active" status and then conducting a shift turnover. The turnover being review of the Control Room log back to the last watch, read and sign the turnover sheet and walkdown the main control board prior to relieving the watch.

1.0005 / 1.5 A computer repair man from corporate has come to work on the plant computer in the computer room. In his repair kit are two pint bottles of isopropal alcohol. What actions must be taken to allow the repair man to take the entire volume of alcohol into the computer room? Dage WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT - RO 05/01/89

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| Ques # / Pts | Question | Exam # : RO : 890011 |
|--------------|--|---------------------------|
| 1.0006 / 1.6 | An approach to criticality is being per- rod withdrawl. The 50 stops control roo is close to criticality but still subcr | d motion when the reactor |
| | The SR count rate should | |
| | a. Continue to increase, but at a slowe | er rate. The startup rate |
| | should stabilize at a lower positive | e value. |
| | b. Continue to increase for a short time startup rate should gradually decreased | |
| | c. Stop increasing and stabilize at its startup rate should immediately deci | |
| | d. Begin to slowly decrease. The star decrease to zero from a slightly neg | |
| 1.0007 / 2.2 | LINE RESULTS IN 4160V BUS 1-3 BEING POW | ERED FROM 4160V BUS 1-2 |
| | VIA ACB 2T3. WHAT ACTIONS CAN THE OPERATION STATION SERVICE TRANSFORMER OPERATION THE 1206 LINE IS RESTORED? | |
| | The plent was operating at 100% power w | hop "A" Vitel bue was |

1.0008 / 2.1 The plant was operating at 100% power when "A" Vital bus was lost. All equipment responded as expected. The primary side operator notices that pressurizer level on Channels 2 and 3 is increasing. List two reasons why pressurizer level is increasing? WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT - RO 05/01/89

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Exam # : RO : 890011 Ques # / Pts Question The reactor is at 100% power. The lower detector in PR channel 1.0009 / 2.3 34 failed low. Channel 34 was removed from service. which one of the following statements is true concerning actions that must be taken at this time: The overpower trip bistables must be tripped within one hour. a. The rod stop must be reset to allow automatic outward rod b. motion. c. Axial offset monitoring must be commenced within 15 minutes. A Quadrant Power Tilt calculation must be done every 24 hours d. using the remaining operable power range channels. The plant is in a refueling condition with the reactor vessel 1.0010 / 1.6

drained down below the flange level in preparation to lift the head. Flow of the RHR system is increased when taking manual control of RH-FCV-602 (bypass flow control valve). The operator notices that the RHR pump amps are fluctuating 40 amps. Which of the following would best describe the actions that the operator should take?

a. Start the non-operating RHR pump.

- b. Decrease the flow of the operating RHR pump and start the second pump.
- c. Stop the RHR pump that was running, increase the water level in the vessel, vent the pumps prior to restart.
- d. Stop operating RHR pump, go solid and remove decay heat with the steam generators.
- 1.0011 / 1.8 The plant is in MODE 3 when a total loss of offsite power is experienced. Both diesel start and load normally. All other conditions are normal.
 - a. How is natural circulation flow in the RCS confirmed?
 - b. How would you classify this situation if these conditions still existed 20 minutes later?

Dage WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT - RO 05/01/89

Ques # / Pts Question

5

Exam # : RO : 890011

With the plant operating normal in MODE 1, a fire is reported on 1.0012 / 1.4 Emergency Bus 8. What actions must be taken by the control room operators to eenergize the bus?

1.0013 / 1.7 With POST SOAK completed following a "Response to Imminent Pressurized Thermal Shock Condition" you are required to maintain RCS pressure and cold leg temperatures within certain limits. The event that just occurred was a multiple steam line break in containment. Using the following parameters determine if you are maintaining RCS pressure and cold leg temperatures within the operating zono.

> Loop 1 TC 320 degrees F Loop 2 TC 322 degrees F PT 403 1015 psig Loop 3 TC 325 degrees F PT 404 1010 psig Loop 4 TC 320 degrees F Containment Pressure 3 psig CD 1/CD 2 reading less than 1 R/Hr

During the performance of ECA 2.1 "Uncontrolled Depressurization 1.0014 / 1.7 of all steam generators" it was noted that the Containment Pressure was reading 42 psig. What action is required at this time?

| Page 6 Nuc | lear Tr | WRITTEN EXAMINATION raining Department / Connecticut Yankee Operator Training Course Exam : LORT - RO 05/01/89 | |
|---------------|--|--|------------|
| lues # / | Pts | Question Exam # : RO : 890 | 011 |
| 1.0015 / | 2.7 | The control room operators are responding to a reactor trip without SI when a red condition is indicated on subcritical status tree. The operators re-verify that the reactor and turbine have tripped, ensure that that the AFW pumps are run initiate emergency boration, and begin checking for possible causes of the loss of subcriticality. Their investigation reveals the following: | nning, |
| | RCS temperature and pressure are decreasing rapidly. The pressure in #1 S/G is decreasing uncontrollably. The MSIVs and MSIV bypass valves for all S/Gs are c The normal dilution flow path isolation valve is clo The chemical addition tank inlet and outlet valves a closed. The local makeup isolation valve is closed. | losed. osed. | |
| | | Based on these indications, what is the probable cause of the loss of subcriticality? | nis |
| | | a. Excessive cooldown caused by an unisolable ruptured b. Excessive cooldown caused by an unisolable faulted c. Inadvertent dilution flow path alignment d. Loss of secondary heat sink | S/G S/G |
| 1.0016 / | 1.9 | A LOCA causes RCS pressure to drop to 1600 psi causing SI. I will following valves be effected? | How |
| | | SI MOV 861A CD MOV 871A BA MOV 373 CH MOV 292B LD MOV 200 CH MOV 257 CH MOV 32 | |

Stal return MOVs

WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT - RO 05/01/89

| lues # / | Pts | Question | Exam # : RO : 890011 |
|----------|-----|---|--|
| 1.0017 / | 2.4 | Following a safety injection, you are Trip or Safety Injection, and have jus Feedwater Isolation) when you discover water flow to the steam generators and started. Should you: | t completed step 5 (Verify that there is no feed |
| | | A. Immediately go to FR-H.1, Loss of | Secondary Heat Sink |
| | | B. Complete the immediate actions and Secondary Heat Sink | then go to FR-H.1, Loss o |
| | | C. Go to FR-H.1, Loss of Secondary He procedure tells you to commence monito Safety Function Status Trees | |
| | | D. Itinue on in E-O then Go to FR-H bink, when specifically directed b | H.1, Loss of Secondary Heat by a procedure step in E-0. |
| 1.0016 / | 1.6 | During transfer to two path recirculat is checked to be greater than 80 psi. necessary? | tion, RHR discharge pressur Why is this step |
| 1.0019 / | 1.8 | A small-break LOCA has occurred. The implementation of procedure EOP E-O ar procedure E-1, Loss of Reactor or Seco the operators to check the intact S/G | nd are implementing ondary Coolant. E-1 direct |
| | | The purpose of this step is to ensure | which of the following? |
| | | a. S/G water levels are sufficient to | |

- b. Sufficient S/G water inventory is available to provide an adequate heat sink.
- c. S/G water level instrumentation is functioning properly, and the AFW throttle valves are adjusted correctly.
- d. An excessive S/G cooldown does not complicate the recovery procedure.

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Dage WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT - RO 05/01/89

Ques # / Pts Question

8

Exam # : RO : 890011

The plant is in an emergency condition, and the control room 2.6 1.0020 / operators are performing ES-0.3, Natural Circulation Cooldown with Steam Void in the Vessel (with RVLIS). The operators try unsuccessfully to start an RCP. They continue the RCS cooldown (cooldown rate is 10 degrees/hour) and intiate RCS depressurization. To keep PZR level within the desired band at this point, an operator establishes charging significantly greater than letdown.

> With charging significantly greater than letdown, which of the following should occur under these conditions?

| | PZR PRESSURE | VESSEL VOID | PZR LEVEL |
|----|--------------|-------------|-----------|
| a. | Increase | Shrink | Decrease |
| ь. | Decrease | Grow | Increase |
| с. | Increase | Grow | Increase |
| d. | Decrease | Shrink | Decrease |

1.0021 / 2.6 The following questions pertain to a S/G Tube Rupture.

- Why should a ruptured S/G (secondary side) be isolated before 3. starting RCS cooldown in the S/G Tube Rupture procedure E-3?
- b. Why do we try to keep a RCP running during the cooldown and depressurization of the S/G?

1.0022 / 1.5

You are assigned to the relief crew and are doing surveillance testing when a station blackout occurs. An alert is declared and the evacuation alarm sounds. You should immediately:

a. Evacuate the site and report to the EOF. b Evacuate the site and report to the INFO Canter.

c Report to the control room.

d. Proceed to the Diesel Room to help the AO restore power.

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| Page 9 WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT - RO 05/01/89 | | | | | | | |
|--|-----|--|--|--|--|--|--|
| Ques # / | Pts | Question | Exam # : RO : 890011 | | | | |
| 1.0023 / | 1.8 | During the outage an electrician is ele a 480 Volt bus that he thought was deer event(RO and SRO) and determine the not this event.(SRO) | nergized. Classify the | | | | |
| 1.0024 / | 1.9 | Following a line fault on the 1206 line operate at 100% power with Bus 1-3 bein ACB 2T3. CONVEX estimates 9 hours untr restored. To comply with Technical Spe must be performed? | ng powered from Bus 1-2 via il the 1206 line can be | | | | |

1.0025 / 1.3 The plant is operating at 80% power to do flux maps after refueling. PR channel 34 is tagged out of service because of a power supply problem. Subsequently PR channel 32 lower detector fails.

> Assuming that it will take approximately 12 hours or longer to fix N34, what actions should you take with respect to plant operations?

a. Do not change plant power level until at least one PR channel

is restored to operable status.

- b. Proceed to HOT STANDBY condition. The reactor must be shut down under these circumstances.
- c. Continue normal power operations and increase load to 100% when flux mapping is complete.
- d. Verify that the plant is above Permissive P7 setpoint, and trip the Overpower Trip bistables on Channel N32.

| Page | 10 Nuclear | WRITTEN EXAMINATI Training Department / Connectio Course Exam : LORT 05/01/89 | ut Yankee Operator Training |
|----------|---------------|--|-----------------------------|
| ******** | # / Pts | Question | Exam # : RO : 890011 |

1.0026 / 2.1 The plant is in STARTUP (MODE 2) with three RCPs in operation. The non-operating pump is operable and the loop is ready to returned to OPERABLE status. Is the plant in the proper mode to allow for returning of the ISOLATED loop to service? Justify your answer.

NRC MASTER

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT - RO 05/01/89

| 11em # | Ques # | Points | Question | ***** | Answer | Exam # R0:890011 |
|--------|--------|--------|--|---|---|---|
| 003169 | 1.0001 | 2.4 | 100% power run. All normal except that wh tripped on an electri investigation and the re-opened. Data is 2 degrees, the process and boron concentrati 5.3-19 to determine i | | 5ppm(75%), therefore SDM is aded LP REF: L35011 K/A F RATING: 3.5/3.9 ED: DIFF: 3 TIME: 5 | Duate (25%) REF: 004000K5.19 K/A 5 PROC REF: 5.3-19 |
| 003243 | 1.0002 | 1.9 | balance. If one | of RCP horsepower and SG vice.now will the | | e calculated values higher (.5) and blowdowr r |
| | | | | | | A REF: 193007K1.08 K/A 3 PROC REF: HTFF MAN MINUTES |
| 003359 | 1.0003 | 2.2 | being shutdown for RCP seal replacem shutdown, power level was at 100% for following power | 30% power for 48 hrs after ent for 20 days. Prior to 68 days. Which of the would be used for these | B LP REF: 587503 K/A B | REF: 001000K5.10 K/A 2 PROC REF: NOP 2.2-1 MINUTES |
| | | | 8. 30% to 100% 3 | %/hour | | |
| | | | | 0%/hour %/hour | | |
| | | | | 5%/hour 0%/hour | | |
| | | | d. 1% hour | | | |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT - RO 05/01/89

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| ten # | Ques # | Points | Question | Answer | Exam # R0:890011 |
|--------|--------|--------|--|---------------|---|
| 003302 | 1.0004 | 1.4 | A control room operator is returning from a special assignment which removed him from his watchstanding duties for a period of six and one-half months. Which one of the following | C | |
| | | | best describes the action(s) necessary for the operator to relieve the watch? | | <pre>x/A REF: 194001A1.03 K/A E0: 4 PROC REF: 0DI-1/ACT</pre> |
| | | | a. Stand 8 hours of watch under instruction. Read and sign the turnover sheet, review the | 1.0-8 GIFF: 2 | |
| | | | Control Room log, and walkcown the main control board prior | | |
| | | | to relieving the watch. | | |
| | | | b. Stand 8 hours of watch under instruction.Read and sign | | |
| | | | the turnover sheet, review the control room logs back to the last watch stood, and walkdown the main | | |
| | | | control prior to relieving the watch. | | |
| | | | Stand 40 hours of watch under instruction, have a letter | | |
| | | | from the Station Superintendent reinstating the operator's | | |
| | | | license to an "Active" status and then conducting a shift turnover.The turnover includes reviewing the | | |
| | | | Control Room log back to the last watch, read and sign | | |
| | | | the turnover sheet, walkdown the main control board prior | | |
| | | | to relieving the watch. | | |
| | | | d. Stand 56 hrs of watch under instruction.Have a letter from | | |
| | | | the Station Superintendent reinstating the operator's license | | |
| | | | to an "Active" status and then conducting a shift turnover. | | |
| | | | The turnover being review of the Control Room log back to the | | |
| | | | last watch, read and sign the turnover sheet and walkdown the main control board prior to relieving the | | |
| | | | watch. | | |

WRITTEN EXAMINATION ANSWER KEY Parge 3 Nuclear Training Department / Connecticut Yankee Operator Training LORT - RO 05/01/89 Points Question Answer Exam # R0:890011 Item # Ques # 003242 1.0005 1.5 A computer repair man from corporate has come to written permission by SCO or SS (.33); Contained work on the plant computer in the computer rope in a suitable container not to exceed 1 In his repair kit are two pint bottles of quart(.33): Must have a dedicated fire watch isopropal alcohol. What actions must be taken assigned to the activity.(.33) to allow the repair man to take the entire volume of alcohol into the computer room? LP REF: ADMSG K/A REF: 194001K1.16 K/A RATING: 3.5/4.2 EO: N/A PROC REF: ACP 1.0-33 DIFF: 2 TIME: 2 MINUTES 1.6 An approach to criticality is being performed by B 003240 1.0006 means of control rod withorawl. The RO stops control rod motion when the reactor is close to LP REF: 87-1-L02 K/A REF: 192008K1.03 K/A criticality but still subcritical. RATING: 3.9/4.0 EO: 5 PROC REF: RXTH MAN The SR count rate should ... DIFF: 2 TIME: 3 MINUTES a. Continue to increase, but at a slower rate. The startup rate should stabilize at a lower positive value. b. Continue to increase for a short time and then plateau. The startup rate should gradually decrease to zero. c. Stop increasing and stabilize at its present value. The startup rate should immediately decrease to zero. d. Begin to slowly decrease. The startup rate should gradually decrease to zero from a slightly negative value.

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT - RO 05/01/89

| Item # | Ques \$ | Points | Question | Answer | Exam # R0:890011 |
|--------|---------|--|--|---|---|
| 002901 | 1.0007 | 2.2 | What actions should the operator take to reestablish TWO STATION SERVICE TRANSFORMER | 2. OPEN 1206-12R-5 (.2) 3. CLOSE 12R-1T-2 (389T3 4. CLOSE 12R-2263-2 (395 5. OPEN 2T3 (.2) (must be in correct s credit) LP. REF: \$87504 E OBJ TERM | 99) (.2) 1) (.2) equence for full |
| 002718 | 1.0008 | 2.1 | The plant was operating at 100% power when "A" Vital bus was lost. All equipment responded as | TIME 10 The letdown valves shut (| .5) and the selected |
| | | expected. The primary side operator notices that pressurizer level on Channels 2 and 3 is | | ve has falled open | |
| | | | | LP REF:CY-OP-LOCT-88-1-LE REF:D01000x3.01 | 18104 K/A |
| | | | | ELO REF: 0 RATING:3.2/3.4 | K/A |
| | | | | DIFF: 3 AOP3.2-15 | PROC REF: |
| | | | | | |

WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT - RO 05/01/89

| ltem # | Ques ¢ | Points | Question | Answer | Exam # R0:890011 |
|--------|--------|--------|---|--------------------|---------------------------|
| 003289 | 1,0009 | 2.3 | The reactor is at 100% power. The lower detector in PR channel 34 failed low. Channel 34 was removed from service. | C | |
| | | | | RATING: 3.7/3.8 EC |): 5 PROC REF: ADP 3.2-14 |
| | | | a. The overpower trip bistables must be tripped within one hour. | DIFF: 3 IIME. | 3 MINUIES |
| | | | b. The rod stop must be reset to allow automatic outward rod motion. | | |
| | | | Axial offset monitoring must be commenced within 15 minutes. | | |
| | | | A Quadrant Power Tilt calculation must be done every 24 hours using the remaining operable power range channels. | | |
| | | | ungine re. | | |
| | | | | | |
| 003303 | 1.0010 | 1.6 | The plant is in a refueling condition with the reactor vessel drained down below the flange level in preparation to lift the nead. Flow of the RHR system is increased when taking manual control of RH-FCV-602 (bypass flow control valve). The operator notices that the RHR pump amps are fluctuating 40 amps. Which of the following would best describe the actions that the operator should take? | LP REF: 87-1-L04 | 0: 9 PROC REF: AOP 3.2-1 |
| | | | a. Stop the operating RHR pump and start the non-operating RHR pump. | | |
| | | | Decrease the flow of the operating RHR pump and start the second pump. | | |
| | | | c. Stop the RHR pump that was running, increase the water level in the vessel, vent the pumps prior to | | |
| | | | restart. | | |
| | | | d. Stop operating RHR pump, go solid and remove decay heat with | | |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT - RO 05/01/89

| item 8 | Ques # | Points | Question | Answer | Exam # R0:890011 |
|--------|--------|--------|--|---|--|
| 03325 | 1.0011 | 1.8 | The plant is in MODE 3 when a total loss of offsite power is experienced. Both diesel start and load normally. All other conditions are normal. | maintaining S/G | |
| | | | normai. | 2 sverage reading of | CETs is being maintained |
| | | | a. List four indications of natural circulation | | orio io perna marinearnea |
| | | | flow in the RCS? | | on temperature for the |
| | | | b. How would you classify this situation, loss | | re stabilized at or |
| | | | decreasing below | | |
| | | | later? | | |
| | | | | each active loop | ial temperature across |
| | | | | | er than full power forced |
| | | | | | for given AOP 3.2-30 and |
| | | | | appropriate steps | |
| | | | | b. Unusual Event (.25) | D-1(.25) |
| | | | | LP REF: L88603 K/A RCF RATING: 4.4/4.5 ED: 13 DIFF: 2 TIME: 3 MIN | PROC REF: AOP 3.2-3 |
| 003354 | 1.0012 | 1.4 | With the plant operating normal in MODE 1, a fire is reported on Emergency Bus 8. What actions must be taken by the control room operators to deenergize the bus? | . Open circuit 5 on 1 . Close the 4T5 break | ker.(.2) |
| | | | | . Open 4851/4850 (.2 | |
| | | | | | of "A" Emergency Diesel b |
| | | | | contro power breat | er on MCC-5 and DC |
| | | | | control power breaker | |
| | | | | an DC Bus "A" or Th | PO (.2). |
| | | | | . Open ACB BT2 break | er.(.2) |
| | | | | (concept applied for Al a-h) | OP 3.235 steps 4.5.4 |
| | | | | LP REF: T12000 K/A RE RATING: 3.3/4.1 KR: B | F: 000067EK3.04 K/A PROC REF: AOP 3.2-3 |

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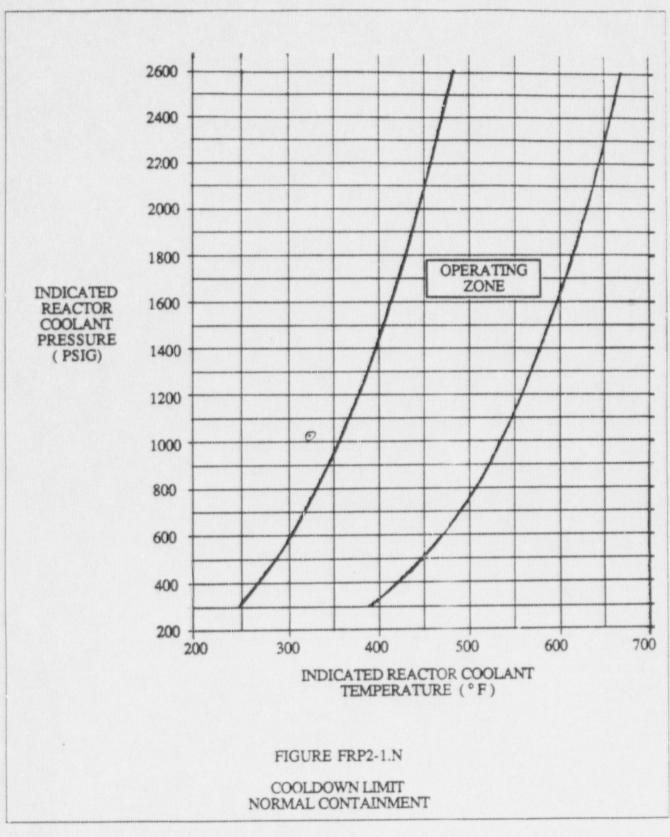
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TITLE RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION

REV. ISSUE/DATE Rev. 1



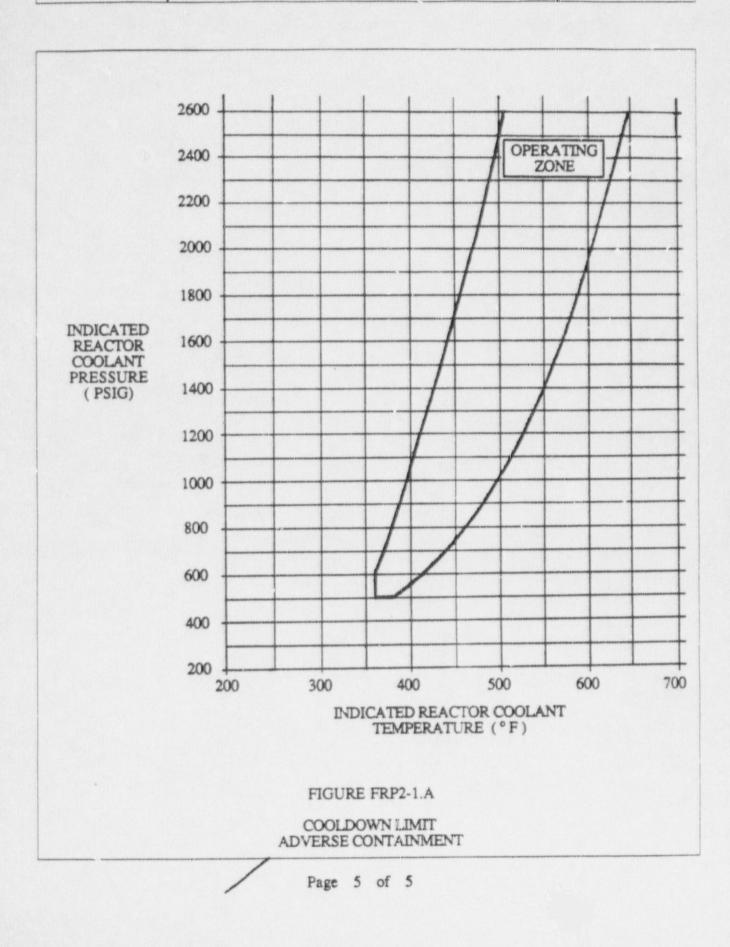
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NUMBER FR-P.2

TITLE RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION

REV. ISSUE/DATE Rev. 1



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WRITTEN EXAMINATION ANSWER KEY

Nuch ar Training Department / Connecticut Yankee Operator Training LORT - RO

LORT - RO 05/01/89

| Item # | Ques # | Points | Question | Answer | Exam # R0:890011 |
|--------|--------|--------|---|--|--|
| 003002 | 1.0013 | 1.7 | to Imminent | Outside the operating zor correct data point (1.0) | ne . See plots for |
| | | | Pressurized Thermal Shock Condition" you are required to maintain RCS pressure and cold leg temperatures | LP REF: CY-OP-LO-EOP-L88 | 8606 K/A REF: |
| | | within | E. OBJ: 6 | K/A RATING: | |
| | | | 3.6/4.1 DIFF: 2 | PROCEDURE | |
| | | | steam line break in containment. Using the following parameters | REF:FR-p.1 TIME:3 minutes | |
| | | | determine if you are maintaining RCS pressure and cold leg temperatures within the operating zone by plotting parameters on the attached curves. | | |
| | | | Loop 1 TC 320 degrees F Loop 2 TC 322 degrees F PT 403 1015 psig Loop 3 TC 325 degrees F PT 404 1010 psig Loop 4 TC 320 degrees F Containment Pressure 3 psig CD 1/CD 2 reading less than 1 R/Hr | | |
| | | | During the performance of ECA 2.1 "Uncontrolled | Svit ECA 2 1 and conduct | FP-7 1 herause a prance |
| 003047 | 1.0014 | 1.1 | Depressurization of all steam generators it was | s path exits. (1.0) | rn-z.i pecause a brange |
| | | | noted that the Containment Pressure was reading 42 psig. What procedural action is required at this time? | LP REF: EOP-L36 E. OBJ: EC 7 | K/A REF: 000-040-EA1.20 K/A RATING: 4.1/4.2 PROCEDURE REF: ECA-2.1 |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT - RO 05/01/89

| em # Ques # | Points | Question | Answer | Exam # RC:890011 |
|--------------|--------|---|---|--------------------|
| 3173 1.0015 | 2.7 | The control room operators are responding to a reactor trip without SI when a red condition is indicated on subcriticality status tree. The operators re-verify that the reactor and turbine have tripped, ensure that that the AFW pumps are running, initiate emergency boration, and begin checking for possible causes of the loss of subcriticality. Their investigation reveals the following: | LP REF: \$87503 K/A RATING: 4.4/4.7 EO: DIFF: 3 TIME: 3 | 7 PROC REF: FR-S.1 |
| | | RCS temperature and pressure are decreasing rapidly. The pressure in #1 S/G is decreasing uncontrollably. The MSIVs and MSIV bypass valves for all S/Gs are closed. The normal dilution flow path isolation valve is closed The chemical addition tank inlet and outlet valves are closed. The local makeup isolation valve is closed. | | |
| | | Based on these indications, what is the probable cause of this loss of subcriticality? a. Excessive cooldown caused by an unisolable ruptured S/G b. Excessive cooldown caused by an unisolable faulted S/G c. Inadvertent dilution flow path alignment d. Loss of secondary heat sink | | |
| 02738 1.0016 | 1.9 | A LOCA causes RCS pressure to drop to 1600 psi causing SI. How will the following valves be effected? | MOV 861A-OPENS MOV 871A-OPENS MOV 373-OPENS | |
| | | (open,close,as is, or throttled) SI MOV 861A CD MOV 871A BA MOV 373 CH MOV 292B LD MOV 200 CH MOV 257 | MOV 292B-OPENS MOV 200-CLOSES MOV 257-CLOSES MOV 32-AS IS SEAL RETURNS-as is (LP REF:CY-OP-LOCT-87 REF:013000A4.03 | |
| | | CH MOV 32 Seal retur Vs | ELO REF: 13 RATING:4.5/4.7 | K/A |
| | | | | |

WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT - RO 05/01/89

| ltem # | Ques # | Points | Question | Answer | Exam # R0:890011 |
|--------|--------|--------|---|--|--|
| 02741 | 1.0017 | 2.4 | Following a safety injection. You are performing E-O, Reactor Trip or Safety Injection, and have just completed step 5 iverify Feedwater Isolation) when you discover that there is no | D. Go to FR-H.1, Loss when specifically step. | of Secondary Heat Sink, directed by a procedure |
| | | | feed water flow to the steam generators and the AFW pumps cannot be started. Should you: | LP REF: L88105 E0 9 K/A REF: 000007GENA12 | K/A RATING: 3.8/3.9 |
| | | | A. Immediately go to FR-H.1. Loss of Secondary Heat Sink | | |
| | | | B. Complete the immediate actions and then go to FR-H.1, Loss of Secondary Heat Sink | | |
| | | | C. Go to FR-H.1, Loss of Secondary Heat Sink, as soon as the | | |
| | | | procedure tells you to commence monitoring the Critical Safety Function Status Trees | | |
| | | | D. Continue on in E-O then Go to FR-H.1, Loss | | |
| | | | of Secondary Heat Sink, when specifically directed by a procedure step in E-0. | | |
| 02749 | 1.0018 | 1.6 | During transfer to two path recirculation, RHR discharge pressure is checked to be greater than 80 psi. Why is this step necessary? | foreign object i clo | ng the RHR suction line is could cause the RHR pum charge pressure.) |
| | | | | LP REF: 587504 EO 4 K/A REF: 100011EK3.00 D1FF: 2 TIME: 2 MINU | 6 K/A RATING: 3.9/4.1 TES |
| 03059 | 1.0019 | 1.8 | A small-break LOCA has occurred. The operators have completed implementation of procedure EOP E-0 and are implementing procedure E-1, Loss of | В | |
| | | | Reactor or Secondary Coolant. E-1 directs the operators to check the intact S/G water levels. | LP: 87-587507 EO: 4 K/A REF: 070009EK3.22 | K/A RATING: 4.4/4.5 |
| | | | The purpose of this step is to ensure which of the following? | DIFF: 2 PROCEDURE TIME: 2 MIN | |
| | | | a. S/G water levels are sufficient to cover a ruptured S/G tube. b. Sufficient S/G water inventory is available to provide an | | |
| | | | adequate heat sink. c. S/G water level instrumentation is | | |

Page 9

the AFW throttle valves are adjusted correctly. d. An excessive S/6 cooldown does not

in family and

complicate the recovery procedure.

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT - RO

| Item # | Ques # | Points | Question | | | Answer | Exam # RO:890011 |
|---------|--------|--------|--|---|---|---|--|
| 03387 | 1.0020 | 2.6 | unsuccessfully to st the RCS cooldown (co degrees/hour) and in To keep PZR level wi this point, an opera significantly greate | rs are performing Cooldown with Stea IS). The operator art an RCP. They oldown rate is 10 tiate RCS depress thin the desired t tor establishes ch r than letdown. | ES-D.3, am Void in rs try continue urization. band at harging | LP REF: L88603 K/A | REF: 002000A2.03 K/A TLO PROC REF: ES-0.3 NUTES |
| | | | With charging signif letdown, which of th describes the system | e following four a | | | |
| | | | PZR PRESSURE LEVEL | VESSEL VOID | PZR | | |
| | | | | ally day any any any any any any any any any a | | | |
| | | | a. Increase | Shrink | Decrease | | |
| | | | b. Decrease | Grow | Increase | | |
| | | | c. Increase | Grow | Increase | | |
| | | | d. Decrease | Shrink | Decrease | | |
| | | | | | | | |
| 0.9- :- | 0021 | 2.6 | The following questi Rupture. | ons pertain to a l | | environment (.25) | ioactivity released to the or prevent overfill(.25): id and even cooldown of the |
| | | | | | | RCS.(.25) or It also provides | a better way to reduce RCS normal spray flow. (.25) |
| | | | S/G Tube Rupture procedur | e E-3? | | LP REF: \$87505 E0 K/A REF: 000038EK3. | 5 06 K/A RATING: 4.2/4. |
| | | | a RCP running | why it is desiral own and depressur | ble to keep | DIFF: 3 TIME | |

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KRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT - RO

| ten # | Ques # | Points | Question | Answer | Exam # R0:890011 |
|-------|--------|--|--|---|------------------------------------|
| 02732 | 1.0022 | 1.5 | You are assigned to the relief crew and are doing surveillance testing when a station | c(1.0) | |
| | | | blackout occurs. An alert is declared and the evacuation alarm sounds. You should immediately: | LP REF:CY-EP-L10 | K/A REF:19400141.16 |
| | | | a. Evacuate the site and report to the EOF. | ELO REF: 15 | K/A RATING:3.1/4.4 |
| | | | b. Evacuate the site and report to the INFO Center. | DIFF: 2 | PROC REF:EPIP 1.5-14 |
| | | | c. Report to the control | TIME: 2 min | |
| | | | d. Proceed to the Diesel Room to help the AO restore power. | | |
| | | | | | |
| 02786 | 1.0023 | 1.8 | During the outage an electrician is electrocuted | ECHO (100%) | |
| | | while working on a 480 Volt bus that he thought was deenergized. Classify the event. | REF: EPIP 1.5-1 ATTAC | | |
| | | | | LP: CY-EP-L10 EO 7,9 K/A REF: 194001A1.16 TIME: 3 MINUTES DIFF | 5 K/A RATING 3.1/4.4 |
| 02743 | 1.0024 | 1.9 | Following a line fault on the 1206 line, the plant continues to operate at 100% power with Bus 1-3 being powered from Bus 1-2 via ACB 2T3. | within one nour.(1.0) | f the remaining AC sources |
| | | | CONVEX estimates 9 hours until the 1206 line can be restored. To comply with Technical Specifications, what actions must be performed? | LP REF: AOP-L17 ED 1 K/A REF: D56GENA8 REF: Tech Spec 3.12.1 TIME: 3 WINUTESGENA12 | K/A RATING: 2.9/3.4 1.1 DIFF: 3 |

WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training

LORT - RO 05/01/89

| iten # | Ques # | Points | Question | Answer | Exam # R0:890011 |
|---------------|---|---|---|---|------------------|
| 003292 1.0025 | 1.3 | The plant is operating at 80% power to do flux maps after refueling. PR channel 34 is tagged out of service because of a power supply problem. Subsequently PR channel 32 lower detector fails. Assuming that it will take approximately 12 hours or longer to fix N34, what actions should you take with respect to plant operations? | LP REF: L88604 K/A | REF: 000033EA2.10 K/A 5 PROC REF: TS 3.9 INUTES | |
| | | a. Do not chatige plant power level until at least one PR channel is restored to operable status. | | | |
| | | | b. Proceed to HOT STANDBY condition. The reactor must be shut down under these circumstances. | | |
| | Continue formal power operations and increase lord to 100% when flux mapping is complete. | | | | |
| | | d. Verify that the plant is above Permissive P7 setpoint, and trip the Overpower Trip bistables on Channel N32. | 1 | | |

003293 1.0026

2.1 The plant is in STARTUP (MODE 2) with three RCPs You cannot restore an isolated loop unless you in operation. The non-operating pump is operable and the loop is ready to returned to subcritical by 1000 pcm (.5) Or(must comply oPERABLE status. State two reasons that the with Tech Spec 3.3.1.6 (.5) and NOP 2.4-7 (.5)) plant is not in the proper mode to restore the isolated loop to service.

LP REF: L8: 07 K/A REF: D03GENK06 K/A RATING: 3.4/3.8 E0: 5 PROC REF: TECH SPECS DIFF: 3 TIME: 3 MINUTES

NRC MASTER

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : LORT-SRO Examination Category : 1

| Examinee : | Final Grade : |
|----------------------------------|------------------------------|
| Examination Number : RO : 890012 | Developed : |
| Date Administered : 05/01/89 | Approved : N.T.D. Supervisor |

Instructions to the Examinee :

- 1. Talking during the examination is strictly forbidden.
- 2. If a question is not understood, raise your hand so that a proctor/examiner may assist you.
- All required reference materials will be provided by the proctor/examiner.
- 4. Cheating in any form may result in a recommendation for disciplinary action.
- Each examination response sheet shall be numbered by you. You shall write your name or initials on each examination response sheet.
- 6. The passing grade requires a final grade of at least 80%.
- 7. The total duration of this examination shall be 2.00 hours.

All work done on this examination is my own; I have neither given nor received aid.

Student's Signature

ATTACHMENT 1

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : LORT-SRO

Examination Number : RO : 890012 Date Administered : 05/01/89

| Category Value | % of <u>Total</u> | Student's Score | % of <u>Cat. Value</u> | Category |
|-------------------|----------------------|--------------------|---------------------------|---------------------|
| 50.0 | 100.00 | | | LIMITS AND CONTROLS |
| 0.0 | 0.00 | | | |
| 0.0 | 0.00 | | | |
| 0.0 | 0.00 | | | |
| 50.0 | 100.00 | | | Totals |
| | | Final Grade | % | |

WRITTEN EXAMINATION

Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT-SRO 05/01/89

| Ques # / Pts Question Exam # : RO : 83001 | Ques # / Pts Question | Exam # : | RO : 830012 |
|---|-----------------------|----------|-------------|
|---|-----------------------|----------|-------------|

- 1.0001 / 2.0 The plant tripped one hour ago from an extended 100% power run. All recovery operations were normal except that when restarting #3 RCP, it tripped on an electrical fault. This is under investigation and the loop stop valve was re-opened. Data is 20 EFPD, Tavg = 535 degrees, the process computer is not available and boron concentration is 840 ppm. Use SUR 5.3-19 to determine if adequate shutdown margin is being maintained. Complete all required data sheets.
- 1.0002 / 1.9 Core thermal power is calculated using a heat balance. If one neglects the effects of RCP horsepower and SG blowdown being in service, how will the calculated value be affected?
- 1.0003 / 2.1 The plant has been at 30% power for 48 hrs after being shutdown for RCP seal replacement for 20 days. Prior to shutdown, power level was at 100% for 68 days. Which of the following power ascension guidelines would be used for these conditions?
 - a. 30% to 100% 3%/hour
 - b. 30% to 80% 10%/hour
 80% to 100% 3%/hour
 - c. 30% to 80% 15%/hour 80% to 100% 10%/hour

d. 1% hour

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WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT-SRO 05/01/89

| Ques # / Pts | Question | Exam # : RO : 890012 |
|--------------|--|--|
| 1.0004 / 1.4 | A control room operator is returning which removed him from his watchstar six and one-half months. Which one describes the action(s) necessary fo watch? | ding duties for a period of of the following best |
| | a. Stand 8 hours of watch under ins Read and sign the turnover sheet Control Room log, and walkdown t to relieving the watch. | , review the previous days |
| | b. Stand 8 hours of watch under ins the turnover sheet, review the c logs back to the last watch stoc control prior to relieving the watch | control room od, and walkdown the main |
| | c. Stand 40 hours of watch under in from the Station Superintendent license to an "Active" status an turnover.The turnover includes r log back to the last watch, read sheet, walkdown the main control the watch. | reinstating the operator's nd then conducting a shift reviewing the Control Room d and sign the turnover |
| | d. Stand 56 hrs of watch under inst the Station Superintendent reins to an "Active" status and then o The turnover being review of the last watch, read and sign the tu- main control board prior to rela | stating the operator's licer conducting a shift turnover. Control Room log back to t urnover sheet and walkdown t |

1.0005 / 1.4 A computer repair man from corporate has come to work on the plant computer in the computer room. In his repair kit are two pint bottles of isopropal alcohol. What actions must be taken t allow the repair man to take the entire volume of alcohol into the computer room?

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WRITTEN EXAMINATION

Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT-SRO 05/01/89

| Ques # / F | ts | Question | Exam # : RQ : 890012 |
|--------------|-----|--|---|
| 1.0006 / 1.6 | | An approach to criticality is being performed by means of con rod withdrawl. The RO stops control rod motion when the reac is close to criticality but still subcritical. | |
| | | The SR count rate should | |
| | | a. Continue to increase, but at a slowe rate should stabilize at a lower pos | r rate. The startup itive value. |
| | | b. Continue to increase for a short time startup rate should gradually decrea | e and then plateau. The se to zero. |
| | | c. Stop increasing and stabilize at its startup rate should immediately decr | present value. The ease to zero. |
| | | d. Begin to slowly decrease. The start decrease to zero from a slightly neg | up rate should gradually ative value. |
| 1.0007 / | 2.2 | With the plant operating at 100% power a results in 4160V BUS 1-3 being powered f 2T3. What actions should the operator ta STATION SERVICE TRANSFORMER OPERATION on 1206 LINE is restored? | rom 4160V BUS 1-2 via AG ke to reestablish TWO |

1.0008 / 2.1 The plant was operating at 100% power when "A" Vital bus was lost. All equipment responded as expected. The primary side operator notices that pressurizer level on Channels 2 and 3 is increasing. List two reasons why pressurizer level is increasing

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WRITTEN EXAMINATION

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Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT-SRO 05/01/89

| Ques # / Pts | Question Exam # : RO : 890012 |
|--------------|--|
| 1.0009 / 2.3 | The reactor is at 100% power. The lower detector in PR channel 34 failed low. Chankel 34 was removed from service. |
| | Which action must be taken at this time: |
| | a. The overpower trip bistables must be tripped within one hour |
| | b. The rod stop must be reset to allow automatic outward rod motion. |
| | c. Axial offset monitoring must be commenced within 15 minutes. |
| | d. A Quadrant Power Tilt calculation must be done every 24 hour |

- 1.0010 / 1.6 The plant is in a refueling condition with the reactor vessel drained down below the flange level in preparation to lift the head. Flow of the RHR system is increased when taking manual control of RH-FCV-602 (bypass flow control valve). The operator notices that the RHR pump amps are fluctuating 40 amps. Which o the following would best describe the actions that the operator should take?
 - a. Stop the operating RHR pump and start the non-operating RHR pump.

using the remaining operable power range channals.

- b. Decrease the flow of the operating RHR pump and start the second pump.
- c. Stop the RHR pump that was running, increase the water level in the vessel, vent the sumps prior to restart.
- d. Stop operating RHR pump, go solid and remove decay heat with the steam generators.
- 1.0011 / i.8 The plant is in MODE 3 when a total loss of offsite power is experienced. Both diesel start and load normally. All other conditions are normal.
 - a. List four indications of natural circulation flow in the RCS
 - b. How would you classify this situation, loss of offsite power if these conditions still existed 20 minutes later?

WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT-SRO 05/01/89

| Ques # / Pts | Question | Exam # | : RO : 890012 |
|--|---|--------|---------------|
| The state of the s | and water services and the second structure second s | | |

1.0012 / 1.3 With the plant operating normal in MODE 1, a fire is reported on Emergency Bus 8. What actions must be taken by the control room operators to deenergize the bus?

1.0013 / 1.7 With POST SOAK completed following a "Response to Imminent Pressurized Thermal Shock Condition" you are required to maintain RCS pressure and cold leg temperatures within certain limits. The event that just occurred was a multiple steam line break in containment. Using the following parameters determine if you are maintaining RCS pressure and cold leg temperatures within the operating zone by plotting parameters on the attached curves. Loop 1 TC 320 degrees F

Loop 2 TC 322 degrees F PT 403 1015 psig Loop 3 TC 325 degrees F PT 404 1010 psig Loop 4 TC 320 degrees F Containment Pressure 3 psig CD 1/CD 2 reading less than 1 R/Hr

1.0014 / 1.7 During the performance of ECA 2.1 "Uncontrolled Depressurization of all steam generators" it was noted that the Containment Pressure was reading 42 psig. What procedural action is require at this time?

| Page 6 Nuclear Tr | Page 6 WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT-SRO 05/01/89 | | | | | |
|----------------------|---|--|--|--|--|--|
| Ques # / Pts | | Ex.m # : RO : 890012 | | | | |
| 1.0015 / 2.7 | without SI when a red con status tree. The operato turbine have tripped, ens initiate emergency borati | s are responding to a reactor trip dition is indicated on subcriticality rs re-verify that the reactor and ure that that the AFW pumps are running on, and begin checking for possible criticality. Their investigation | | | | |
| | The pressure in # The MSIVs and MSI The normal diluti The chemical addi closed. | and pressure are decreasing rapidly. 1 S/G is decreasing uncontrollably. V bypass valves for all S/Gs are closed on flow path isolation valve is closed. tion tank inlet and outlet valves are isolation valve is closed. | | | | |
| | loss of subcriticality? a. Excessive cooldow b. Excessive cooldow | ns, what is the probable cause of this on caused by an unisolable ruptured S/G on caused by an unisolable faulted S/G tion flow path alignment of heat sink | | | | |
| 1.0016 / 1.8 | will the following valves (open,close,as is, or thr | | | | | |
| | CD BA CH LD CH CH | MOV 871A MOV 373 MOV 292B MOV 200 MOV 257 MOV 32 al return MOVs | | | | |

7 Page WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT-SRO 05/01/89

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| Ques # / Pts | Question Exam # : RO : 890012 |
|--------------|---|
| 1.0017 / 2. | Following a safety injection, you are performing E-O, Reactor Trip or Safety Injection, and have just completed step 5 (Verify Feedwater Isolation) when you discover that there is no feed water flow to the steam generators and the AFW pumps cannot be started. Should you: |
| | A. Immediately go to FR-H.1, Loss of Secondary Heat Sink |
| | B. Complete the immediate actions and then go to FR-H.1, Loss of Secondary Heat Sink |
| | C. Go to FR-H.1, Loss of Secondary Heat Sink, as soon as the procedure tells you to commence monitoring the Critical Safety Function Status Trees |
| | D. Continue on in E-O then Go to FR-H.1, Loss of Secondary Heat Sink, when specifically directed by a procedure step in E-O. |
| | |
| 1.0018 / 1. | During transfer to two path recirculation, RHR discharge pressur is checked to be greater than 80 psi. Why is this step necessary? |
| 1.0019 / 1. | A small-break LOCA has occurred. The operators have completed implementation of procedure EOP E-0 and are implementing procedure E-1, Loss of Reactor or Secondary Coolant. E-1 direct the operators to check the intact S/G water levels. |
| | The purpose of this step is to ensure which of the following? |
| | a. S/G water levels are sufficient to cover a ruptured S/G tube b. Sufficient S/G water inventory is available to provide an adequate heat sink. c. S/G water level instrumentation is functioning properly, and |
| | the AFW throttle valves are adjusted correctly. |
| | d. An excessive S/G cooldown does not complicate the recovery |

d. An excessive S/G cooldown does not complicate the recovery procedure.

WRITTEN EXAMINATION

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Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT-SRO 05/01/89

Ques # / Pts Question Exam # : RO : 890012

1.0020 / 2.5 The plant is in an emergency condition, and the control room operators are performing ES-0.3, Natural Circulation Cooldown with Steam Void in the Vessel (with RVLIS). The operators try unsuccessfully to start an RCP. They continue the RCS cooldown (cooldown rate is 10 degrees/hour) and intiate RCS depressurization. To keep PZR level within the desired band at this point, an operator establishes charging significantly greater than letdown.

With charging significantly greater than letdown, which of the following four cases best describes the system response?

| | PZR PRESSURE | VESSEL VOID | PZR %2VEL |
|----|--------------|-------------|-----------|
| a. | Increase | Shrink | Decrease |
| b. | Decrease | Grow | Increase |
| с. | Increase | Grow | Increase |
| d. | Decruase | Shrink | Decrease |

1.0021 / 2.6 The following questions pertain to a S/G Tube Rupture.

- a. List two reasons why a ruptured S/G (secondary side) is isolated before starting RCS cooldown in the S/G Tube Rupture procedure E-3?
- b. Give two reasons why it is desirable to keep a RCP running during the cooldown and depressurization of the RCS?
- 1.0022 / 2.7 The plant was operating at 100% power near the beginning of life when a reactor trip and SI occured. Classify the event and justif your answer based on the following indications:

| CETS 365 F COM | NTAINMENT PRESSURE: 41 psig |
|--------------------------|--|
| RCS PRESSURE: 0 psig | CONTAINMENT TEMP: 250 F |
| PZR LEVEL: 0% | CONTAINMENT LEVEL: 1.6 FT |
| PLENUM LEVEL: 100% | HEAD LEVEL: 0% |
| ALL SI pumps running | CD-1/CD-2/HATCH:1450R/HR ;1400R/HR;85R/H |
| SG PRESSURES: 413/415/41 | 5/405psig SG LEVELS: 62/61/59/62 |

WRITTEN EXAMINATION

Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT-SRO 05/01/89

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|---|--|--|
| Ques # / Pts | Question | Exam # : RO : 890012 |
| 1.0023 / 1.5 | While operating at 100% power, the secondar notices that all annunciators are out, inclu- which were lit previously. Upon investigat that the annunciators have lost power and the restored immediately. | uding two annunciator ion, it is determined |
| | a. How would you classify this situation point of annunciator power could not be restor (Include NRC classification and State Point of the state p | red for 30 minutes? |
| | b. How would you classify the situation in trip occurred while trying to restore a (Include NRC Classification and State P | nnunciator power? |
| | | |
| 1.0024 / 2.0 | The plant is operating at 100% power. Reac discovers that the linear heat generation r specification limit was exceeded on the mon Which of the following parameters monitored prevented this from occuring? | ate technical thly incore map. |
| | a. Quadrant Power Tilt Ratio b. Axial Offset c. Nuclear Enthalpy Rise Hot Channel Facto d. DNB Parameters(RCS, Tavg, PZR Pressure) | r |
| 1.0025 / 2.0 | While the plant is operating at 88% power, Deviation annunciator and the Rod Out of St both alarming. The Incore QPTR is calculat QPTR of 1.03. | ep annunciator are |
| | In response to the QPTR limits, the control perform which of the following? | room operators MUST |
| | a. Calculate the QPTR each hour until it r limits. | eturns to within |
| | b. Reduce thermal power to less than 50% w | ithin 2 hours. |

- c. Reduce PR Overpower Trip setpoint to 91% within 4 hours.
- d. Immediately commence a power reduction and be in HOT STANDBY within 6 hours.

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WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT-SRO 05/01/89

Ques # / Pts Question

Exam # : RO : 890012

- 1.0026 / 1.3 While the plant is operating at 100% power, the air operator for letdown containment isolation valve LD-AOV-230 develops a large air leak. To fix the leak, air must be secured to the valve operator. Chemistry has requested that maximum letdown be maintained because of high RCS activity levels. Maintenance suggests locking LD-AOV-230 open by placing a collar on the valv stem. Plant management agrees and grants approval for the work to start.
 - a. How long can the plant remain in this configuration?
 - b. What must be done if the time limit is exceeded?

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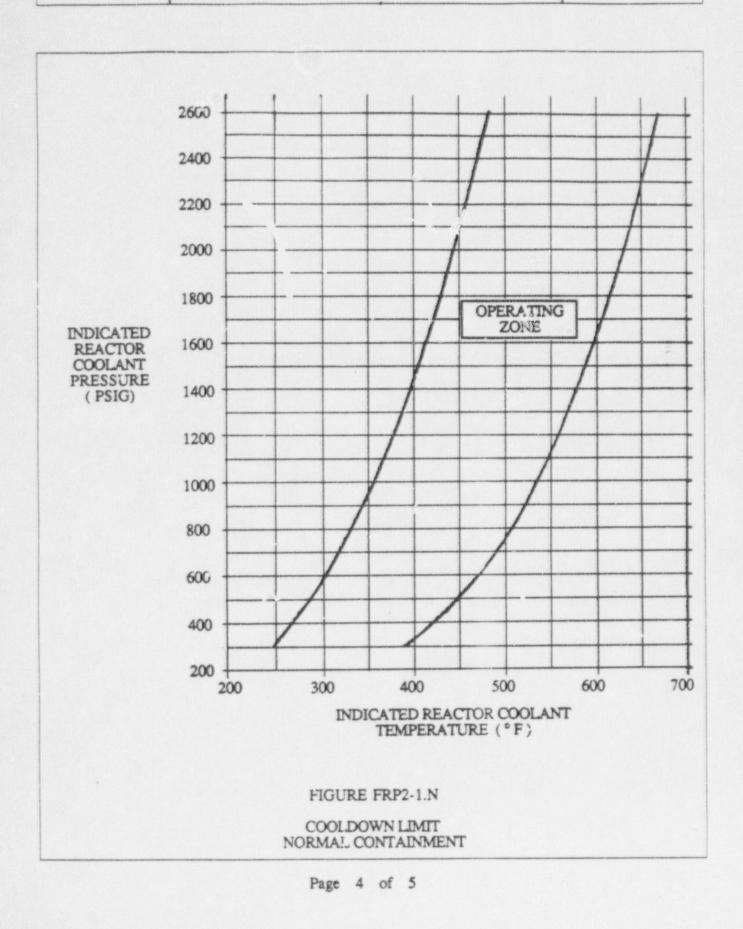
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NUMBER FR-P.2

1

TITLE RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION

REV. ISSUE/DATE Rev. 1



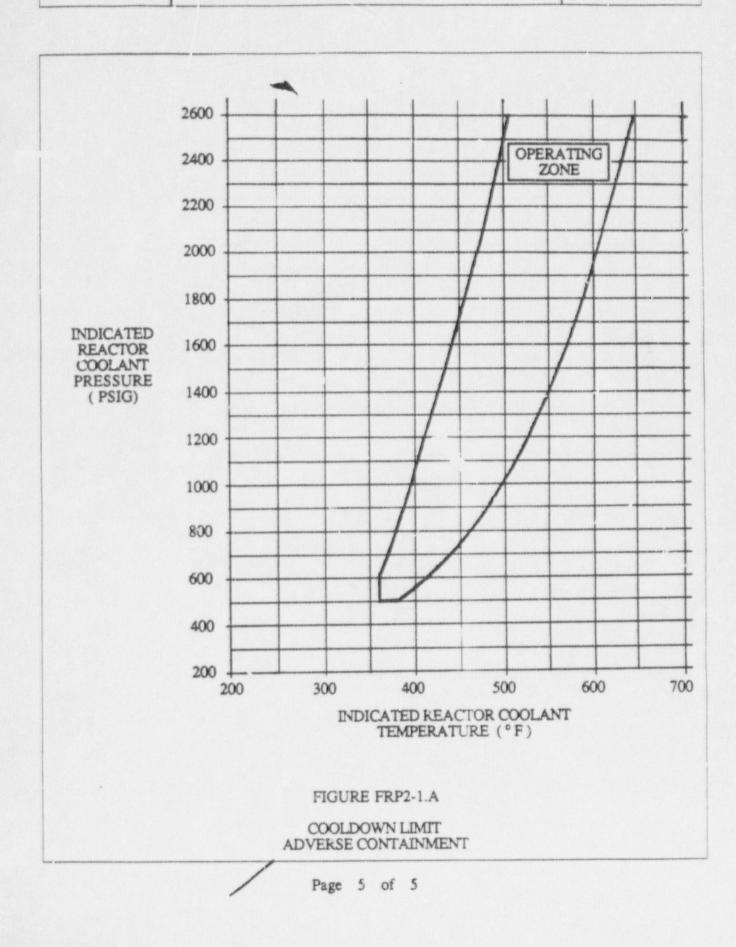
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NUMBER FR-P.2

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TITLE RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION

REV. ISSUE/DATE Rev. 1



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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO 05/01/89

| ltem # | Ques # | Points | Question | Answer Exam # R01890012 |
|--------|--------|--------|---|--|
| 003169 | 1.0001 | 2.0 | The plant tripped one hour ago from an extended 100% power run. All recovery operations were normal except that when restarting \$3 RCP. it tripped on an electrical fault. This is under investigation and the loop stop valve was re-opened. Data is 200 EFPD. Tavg = 535 degrees, the process computer is not available and boron concentration is 840 ppm. Use SUR 5.3-19 to determine if adequate shutdown margin is being maintained. Complete all required data | <pre>BDDM(75%), therefore SDM is adequate (25%) LP REF: L35011 K/A REF: D04000K5.19 K/A RATING: 3.5/3.9 E0: 5 PROC REF: 5.3-19 DIFF: 3 TIME: 5 MINUTES</pre> |
| 003243 | 1.0002 | 1.9 | sheets. Core thermal power is calculated using a heat | Both effects make the calculated values higher |
| | | | balance. If one neglects the effects of RCP norsepower and SG blowdown being in service, how will the calculated value be affected? | (1.0) or RCPs higher (.5) and blowdown higher (.5) |
| | | | | concept applied |
| | | | | LP REF: 87-5-LO3 K/A REF: 193007K1.08 K/A RATING: 3.1/3.4 EO: 3 PROC REF: HTFF MAN DIFF: 3 TIME: 5 MINUTES |
| 003359 | 1.0003 | 2.1 | The plant has been at 30% power for 48 hrs after | |
| | | | being shutdown for RCP seal replacement for 20 days. Prior to | đ |
| | | | shutdown, power level was at 100% for 68 cays. Which of the following power ascension guidelines would be used for these conditions? | LP REF: S81503 K/A REF: 001000K5.10 K/A RATING: 3.5 3.7 EO: 2 PROC REF: NOP 2.2-1 DIFF: 3 TIME: 3 MINUTES |
| | | | a. 30% to 100% 3%/hour | |
| | | | b. 30% to 80% 10%/hour | |
| | | | 80% to 100% 3%/hour | |
| | | | c. 30% to 80% 15%/hour | |
| | | | 80% to 100% 10%/hour | |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO

| tem # | Ques # | Points | Question | Answer | Exam # 80:890012 |
|-------|--------|--------|--|---|--|
| | 1.0004 | | | C LP REF: L88101 RATING: 2.5/3.4 1.0-8 DIFF: 2 | K/A REF: 094001A1.03 K/A E0: 4 PROC REF: 0DI-1/AC |
| | | | d. Stand 56 hrs of watch under instruction.Have a letter from the Station Superintendent reinstating the operator's license to an "Active" status and then conducting a shift turnover. The turnover being review of the Control Room log back to the last watch, read and sign the turnover sheet and walkdown the main control board prior to relieving the watch. | | |

Page 3 Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO 05/01/89 Answer Exam # RO:890012 Points Question Item # Ques \$ 1.4 A computer repair man from corporate has come to written permission by SCO or SS (.33); Contained 003242 1.0005 work in the plant computer in the computer room, in a suitable container not to exceed 1 In his repair kit are two pint pottles of quart(.33); Must have a dedicated fire watch isopropal alcohol. What actions must be taken assigned to the activity. (.33) to allow the repair man to take the entire volume of alcohol into the computer room? LP REF: ADMSG K/A REF: 194001K1.16 K/A RATING: 3.5/4.2 EO: N/A PROC REF: ACP 1.0-33 DIFF: 2 TIME: 2 MINUTES 1.6 An approach to criticality is being performed by B 003240 1.0006 means of control rod withdrawl. The RC stops control rod motion when the reactor is close to LP REF: 87-1-LO2 K/A REF: 192008K1.03 K/A criticality but still subcritical. RATING: 3.9/4.0 ED: 5 PROC REF: RXTH MAN DIFF: 2 TIME: 3 MINUTES The SR count rate should a. Continue to increase, but at a slower rate. The startup rate should stabilize at a lower positive value. b. Continue to increase for a short time and then plateau. The startup rate should gradually decrease to zero. c. Stop increasing and stabilize at its present value. The startup rate should immediately decrease to zero. d. Begin to slowly decrease. The startup rate should gradually decrease to zero from a slightly negative value.

WRITTEN EXAMINATION ANSWER KEY

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO 05/01/89

| Item # | Ques # | Points | Guestion | Answer | Exam # R0;890012 |
|--------------|--------|-----------|--|--|---|
| 002901 1.000 | 1.0007 | .0007 2.2 | 2 With the plant operating at 100% power a line fault on 1206 line results in 4160V BUS 1-3 being powered from 4160V BUS 1-2 via ACB 2T3. What actions should the operator take to reestablish TWO STATION SERVICE TRANSFORMER OPERATION on the 1772 LINE until the 1206 LINE | 2. OPEN 1206-12R-5 (.2) 3. CLOBE 12R-1T-2 (389T399) (.2) 4. CLOSE 12R-22S3-2 (3991) (.2) 5. OPEN 2T3 (.2) | |
| | | | is restored? | LP. REF: S87504 K E OBJ 1ERM K | /A REF 056000 GEN K.5 /A RATING 3.3/3.6 ROCEDURE REF: ANN |
| | | | | | |
| 002718 | 1.0008 | 2.1 | The plant was operating at 100% power when "A" Vital bus was lost. All equipment responded as expected. The primary side operator notices that pressurizer level on Channels 2 and 3 is | charging flow control valv | 5) and the selected e has failed open |
| | | | | LP REF:CY-OP-LOCT-88-1-L88 REF:001000x3.01 | 104 K/A |
| | | | | ELO REF: 3 RATING:3.2/3.4 | K/A |
| | | | | DIFF: 3 AOP3.2-15 | PROC REF: |
| | | | | | |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO

| tem # | Ques # | Points | Question | Answer | Exam # R0:890012 |
|--------|--------|--------|--|-------------------------|--------------------------|
| 003289 | 1.0009 | 2.3 | The reactor is at 100% power. The lower detector in PR channel 34 failed low. Channel 34 was removed from service. | C | |
| | | | Which action must be taken at this time: | RATING: 3.7/3.0 EO: | : 5 PROC REF: AOP 3.2-14 |
| | | | a. The overpower trip bistables must be tripped within one hour. | UIFF: 3 IIME: 3 MINUIES | 9 HINDIED |
| | | | b. The rod stop must be reset to allow automatic outward rod motion. | | |
| | | | c. Axial offset monitoring must be commenced within 15 minutes. | | |
| | | | d. A Quadrant Power Tilt calculation must be done every 24 hours using the remaining operable power range channels. | | |
| 003303 | 1.0010 | 1.0 | The plant is in a refueling condition with the reactor vessel drained down below the flange level in preparation to lift the nead. Flow of the RHR system is increased when taking manual control of RH-FCV-602 (bypass flow control valve). The operator notices that the RHR pump amps are fluctuating 40 amps. Which of the following would best describe the actions that | LP REF: 87-1-104 K | : 9 PROC REF: AOP 3.2-1 |
| | | | the operator should take? a. Stop the operating RHR pump and start the non-operating RHR pump. | | |
| | | | Decrease the flow of the operating RHR pump and start the second pump. | | |
| | | | c. Stop the RHR pump that was running, increase the water level in the vessel, vent the pumps prior to restart. | • | |
| | | | Stop operating RHR pump, go solid and remove decay heat with the steam generators. | 9 | |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO

| Answer Exam # R0:890012 (25 If wrong procedure used) when a total loss of a.1. Steam release from S/Gs is effectively ienced. Both diesel start maintaining S/G 1 other conditions are pressure constant or decreasing 2. Average reading of CETs is being maintained ons of natural circulation or decreasing less than saturation temperature for the pressurizer pressure isify this situation, loss 3. Cold leg temperature stabilized at or decreasing below is still existed 20 minutes saturation temperature for S/G pressure 4. Observed differential temperature across each active loop should be no greater than fu'l power force flow delta T. (.125 each)(credit for given AOP 3.2-30 an appropriate steps) |
|--|
| when a total loss of a.1. Steam release from S/Gs is effectively ienced. Both diesel start maintaining S/G 1 other conditions are pressure constant or decreasing 2. Average reading of CETs is being maintained ons of natural circulation or decreasing less than saturation temperature for the pressurizer pressure sify this situation, loss 3. Cold leg temperature stabilized at or decreasing below is still existed 20 minutes saturation temperature for S/G pressure 4. Observed differential temperature across each active loop should be no greater than fu'l power force flow delta T. (.125 each)(credit for given AOP 3.2-30 an appropriate steps) |
| 1 other conditions are pressure constant or decreasing 2. Average reading of CETs is being maintained ons of natural circulation or decreasing less than saturation temperature for the pressurizer pressure sify this situation, loss 3. Cold leg temperature stabilized at or decreasing below is still existed 20 minutes saturation temperature for S/G pressure 4. Observed differential temperature across each active loop should be no greater than fu'l power force flow delta T. (.125 each)(credit for given AOP 3.2-30 an appropriate steps) |
| 2. Average reading of CETs is being maintainer ons of natural circulation or decreasing less than saturation temperature for the pressurizer pressure sify this situation, loss 3. Cold leg temperature stabilized at or decreasing below is still existed 20 minutes saturation temperature for S/G pressure 4. Observed differential temperature across each active loop should be no greater than fu'l power force flow delta T. (.125 each)(credit for given AOP 3.2-30 an appropriate steps) |
| cns of natural circulation or decreasing less than saturation temperature for the pressurizer pressure 3. Cold leg temperature stabilized at or decreasing below is still existed 20 minutes 4. Observed differential temperature across each active loop should be no greater than fu'l power force flow delta T. (.125 each)(credit for given AOP 3.2-30 an appropriate steps) |
| less than saturation temperature for the pressurizer pressure 3. Cold leg temperature stabilized at or decreasing below as still existed 20 minutes saturation temperature for S/G pressure 4. Observed differential temperature across each active loop should be no greater than fu'l power force flow delta T. (.125 each)(credit for given AOP 3.2-30 an appropriate steps) |
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| decreasing below saturation temperature for S/G pressure 4. Observed differential temperature across each active loop should be no greater than fu'l power force flow delta T. (.125 each)(credit for given AOP 3.2-30 an appropriate steps) |
| 4. Observed differential temperature across each active loop should be no greater than fu'l power force flow delta T. (.125 each)(credit for given AOP 3.2-30 an appropriate steps) |
| each active loop should be no greater than fu'l power force flow delta T. (.125 each)(credit for given AOP 3.2-30 an appropriate steps) |
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| should be no greater than fu'l power force flow delta T. (.125 each)(credit for given AOP 3.2~30 an appropriate steps) |
| flow delta T. (.125 each)(credit for given AOP 3.2-30 an appropriate steps) |
| appropriate steps) |
| appropriate steps) |
| |
| b. Unusual Event (.25), D-1(.25) |
| LP REF: L88603 K/A REF: 000017EA1.21 K/A |
| RATING: 4.4/4.5 EO: 13 PROC REF: AOP 3.2-3 |
| DIFF: 2 TIME: 3 MINUTES |
| ing normal in MODE 1, a . Open circuit 5 on DC panel (.2) |
| mergency Bus 8. What by the control room . Close the 4T5 breaker.(.2) |
| te the pus? . Open 4:31/4850 (.2) |
| |
| . Defeat auto start of "A" Emergency Diesel b |
| openning 40 contro power breaker on MCC-5 and DC |
| control power preaker |
| on DC Bus "A" or TPO (.2). |
| ON DU SUS A OF TPO (12). |
| . Open ACB BT2 breaker.(.2) |
| . Open ACB BT2 breaker.(.2) |
| . Open ACB BT2 breaker.(.2) (concept applied for AOP 3.235 steps 4.5.4 |
| . Open ACB 8T2 breaker.(.2) (concept applied for ADP 3.235 steps 4.5.4 a-h) |
| . Open ACB BT2 breaker.(.2) (concept applied for AOP 3.235 steps 4.5.4 |
| |

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> WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO 05/01/89

| ltem # | Ques # | Points | Question | Answer | Exam # R0:890012 |
|--------|--------|--------|---|---|------------------|
| 003002 | 1.0013 | 1.7 | to Imminent Pressurized Thermal Snock Condition" you are required to maintain RCS pressure and cold leg temperatures within certain limits. The event that just occurred was a multiple steam line break in containment. Using the | COFFECT data point (1 LP REF: CY-OP-LO-EOP 000-009 EK 3.08 E. OBJ: 6 3.6/4.1 DIFF: 2 | .0) |
| 003047 | 1.0014 | 1.7 | During the performance of ECA 2.1 "Uncontrolled Depressurization of all steam generators" it was noted that the Containment Pressure was reading 42 psig. What procedural action is required at this time? | path exits. 1.0) | |

DIFF: 2 TIME: 3 MIN

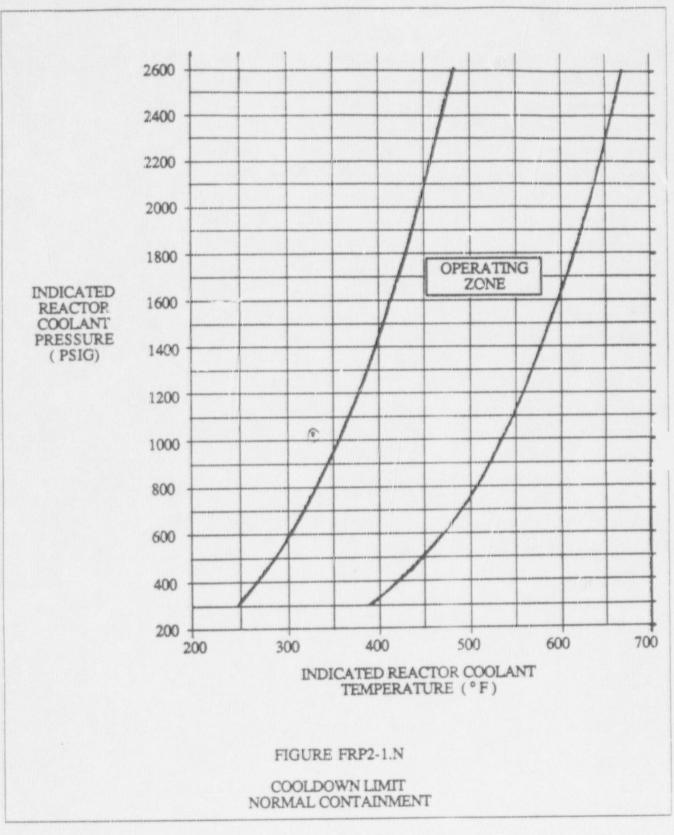
PROCEDURE REF: ECA-2.1

JUN 3 1988

NUMBER F'R-P.2

TITLE RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION

REV. ISSUE/DATE Rev. 1



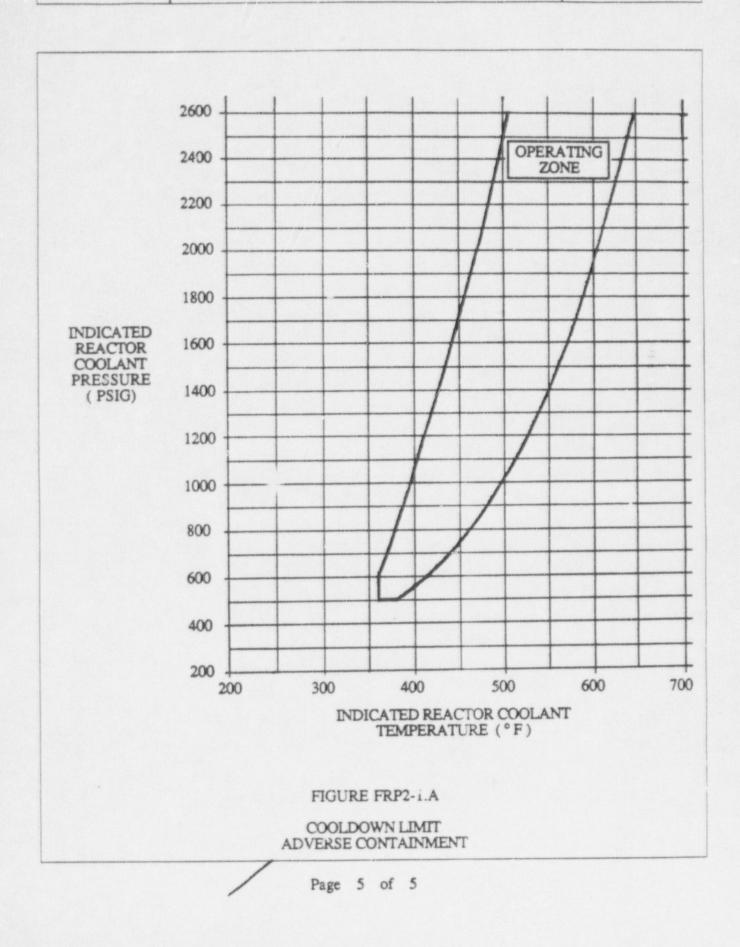
Page 4 of 5

JUN 3 1988

NUMBER FR-P.2

TITLE RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION

REV. ISSUE/DATE Rev. 1



WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO

| tem # | Ques # | Points | Question | Answer | Exam # R0:890012 |
|-------|--------|--------|--|----------------------------------|-----------------------|
| 03173 | 1.0015 | 2.7 | The control room operators are responding to a reactor trip without SI when a red condition is | В | |
| | | | indicated on subcriticality status tree. The | | |
| | | | operators re-verify that the reactor and turbine | LP REF: \$87503 K/A | REF: 000029EK3.12 K/A |
| | | | have tripped, ensure that that the AFW pumms are | | |
| | | | running, initiate emergency boration, and begin | DIFF: 3 TIME: 3 | MINUTES |
| | | | checking for possible causes of the loss of | | |
| | | | subcriticality. Their investigation reveals the following: | | |
| | | | . RCS temperature and pressure are | | |
| | | | decreasing rapidly. | | |
| | | | . The pressure in \$1 S/G is decreasing | | |
| | | | uncontrollably. . The MSIVs and MSIV bypass valves for all | | |
| | | | S/Gs are closed. | | |
| | | | . The normal dilution flow path isolation | | |
| | | | valve is closed. | | |
| | | | . The chemical addition tank inlet and | | |
| | | | outlet valves are | | |
| | | | closed. | | |
| | | | . The local makeup isolation valve is | | |
| | | | closed. | | |
| | | | Based on these indications, what is the probable | | |
| | | | cause of this loss of subcriticality? | | |
| | | | a. Excessive cooldown caused by an | | |
| | | | unisolable ruptured S/G b. Excessive cooldown caused by an | | |
| | | | unisolable faulted S/G | | |
| | | | c. Inadvertent dilution flow path alignment | | |
| | | | d. Loss of secondary heat sink | | |
| | | | | | |
| 2738 | 1.0016 | 1.8 | A LOCA causes RCS pressure to drop to 1600 psi | | |
| | | | causing SI. How will the following valves be | MOV 871A-DPENS | |
| | | | effected? | MOV 373-OPENS | |
| | | | (open, close, as is, or throttled) | MOV 2928-OPENS MOV 200-CLOSES | |
| | | | SI MOV 8614 | MOV 257-CLOSES | |
| | | | CD MOV 871A | MOV 32-AS IS | |
| | | | BA MOV 373 | SEAL RETURNS-as is (| .125 each) |
| | | | CH MOV 292B | | |
| | | | LD MOV 200 | LP REF CY-OP-LOCT-87 | -3-587302 K/A |
| | | | CH MOV 25 | REF: 144.03 | |
| | | | CH MOV 32 | ELO REF: 13 | K/A |
| | | | Seal return MOVs | RATING:4.5/4.7 | n/ M |
| | | | | DIFF:3 | PROC REF: E |
| | | | | | |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO

| Item # | Ques # | Points | Question | Answer | Exam # R0:890012 |
|--------|--------|--------|--|--|--|
| 002741 | 1.0017 | 2.4 | Following a safety injection, you are performing E-0, Reactor Trip or Safety Injection, and have just completed step 5 iverify Feedwater Isolation) when you discover that there is no feed water flow to the steam generators and the | D. Go to FR-H.1, Loss when specifically step. | of Secondary Heat Sink, directed by a procedure |
| | | | AFW pumps cannot be started. Shou'd you: A. Immediately go to FR-H.1, Loss of Secondary | LP REF: L88105 EO 9 K/A REF: D00007GENA12 DIFF: 3 T1ME: 6 MI | |
| | | | Heat Sink | | |
| | | | B. Complete the immediate actions and then go to FR-H.1, Loss of Secondary Heat Sink | | |
| | | | C. Go to FR-H.1, Loss of Secondary Heat Sink, as soon as the procedure tells you to commence monitoring | | |
| | | | the Critical Safety Function Status Trees | | |
| | | | D. Continue on in E-0 then Go to FR-H.1, Loss of Secondary Heat Sink, when specifically directed by a procedure step in E-0. | | |
| | | | During the second second second between Durb | Constation Constal Ing | ere is a possibility that a |
| 002749 | 1.0018 | 1.0 | During transfer to two path recirculation, RHR discharge pressure is checked to be greater than 80 psi. Why is this step necessary? | foreign object may clo from containment. Thi cavitation and low dis (Grader discretion red LP REF: S87504 EO 4 | bg the RHR suction line is could cause the RHR pump scharge pressure.) quired) 8 K/A RATING: 3.9/4.1 |
| | | | | | |
| 003059 | 1.0019 | 1.8 | A small-break LOCA has occurred. The operators have completed implementation of procedure EOP E-0 and are implementing procedure E-1, Loss of Reactor or Secondary Coolant. E-1 directs the | | |
| | | | operators to check the intact S/G water levels. | LP: 87-587504 EO: 4 K/A REF: 000009EK3.22 K/A RATING: DIFF: 2 PROCEDURE: E-1 | |
| | | | The purpose of this step is to ensure which of the following? | TIME: 2 MIN | |
| | | | a. \$/G water levels are sufficient to cover a ruptured \$/G tube. b. Sufficient \$/G water inventory is available to provide an | | |
| | | | adequate heat sink. c. S/G water level instrumentation is | | |

the Afw innoitie valves are objusted correctly. d. An excessive S/G cooldown does not complicate the recovery procedure.

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department Connecticut Yankee Operator Training LORT-SRO 05/01/89

| tem # | Ques # | Points | Question | and against which and also star over the store and star and star store over | | Answer | Exam # R0:890012 |
|--------|--------|--------|---|---|--|---------------------|---|
| 03387 | 1.0020 | 2.5 | The plant is in an emer control room operator. Natural Circulation Joo | are performing | ES-0.3, | A or D | |
| | | | <pre>the Vessel (with RVLIS). The operators try unsuccessfully to start an RCP. They continue the RCS cooldown icooldown rate is 10 degrees/hour) and intiate RCS depressirization. To keep PZR level within the desired band at this point, an operator establishes charging significantly greater than letdown. With charging significantly greater than letdown, which of the following four cases best describes the system response?</pre> | | LP REF: L88603 K/A REF: D02000A2.03 K/A RATING: 4.1/4.6 EO: TLO PROC REF: ES-0.3 DIFF: 3 TIME: 3 MINUTES | | |
| | | | PZR PRESSURE | | PZR | | |
| | | | 10 | | | | |
| | | | a. Increase | Shrink | Decraase | | |
| | | | b. Decrease | Grow | Increase | | |
| | | | c. Increase | Grow | Increase | | |
| | | | d. Decrease | Shrink | Decrease | | |
| 002754 | 1.0021 | 2.6 | The following questions Rupture. | s pertain to a § | /G Tube | environment 1.251cm | dioactivity released to the ad of prevent overfill(.25)b |
| | | | a. List two reasons wi | ny a ruptured S/ | G | RCS. (.25) or and | bid and even cooldown of the |
| | | | (secondary side) is isolated before sta | | | It als: provide | s a better way to reduce RCI normal spray flow. (.25) |
| | | | S/G Tube Rupture procedure i | E-39 | | LP REF: S81605 E | 0 5 |
| | | | nuppero processio i | | | | DE KA PATING 4 2/4 |

K/A REF: 000038EK3.06 K/A RATING: 4.2/4.5 b. Give two reasons why it is desirable to keep DIFF: 3 TIME: 3 MINUTES a RCP running

during the cooldown and depressurization of

the RCS?

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO

05/01/89

| Item # | Ques # | Points | Question | Answer | Exam # R0:890012 |
|--------|--------|--------|---|------------------------------|---|
| 002910 | 1.0022 | 2.7 | The plant was operating at 100% power near the beginning of life when a reactor trip and SI occured.Classify the event and justify your answer based on the following indications: | (.5) (Loss of RCS barrier | and Cont barrier) |
| | | | CETS 365 F CONTAINMENT PRESSURE: 41 | LP REF:CY-EP-L10 | K/A REF:194001A1.16 |
| | | | psig | ELO REF: 1,7 | K/A RATING:3.1/4.4 |
| | | | RCS PRESSURE: 0 DS1g CONTAINMENT TEMP: 250 F | DIFF: 3 | PROC REF:EPIP1.5-1 |
| | | | PZR LEVEL: 0% CONTAINMENT LEVEL: 1.6 FT | TIME: 4 minutes | |
| | | | PLENUM LEVEL: 100% HEAD LEVEL: 0% | | |
| | | | ALL SI pumps running CD-1/CD-2/HATCH:1450R/HR ;1400R/HR;85R/HR | | |
| | | | SG PRESSURES:413/415/415/405psig SG LEVELS: 62/61/59/62 | | |
| 003319 | 1.0023 | 1.5 | While operating at 100% power, the secondary side operator notices that all annunciators are | a. Alers25), C- | (.25) |
| | | | out, including two annunciators which were lit previously. Upon investigation, it is determined that the annunciators have lost power and the power cannot be restored immediately. | | ency (.25), C-2 (.25) |
| | | | How would you classify this situation per the Emergency Plan if annunciator power could not be restored for 30 minutes? (Include NRC classification and State Posture Code) | 2.7/3.6 EC: 2 | REF: D62GENK3 K/A RATING: PROC REF: EPIP 1.5-1 DIFF: 2 |
| | | | b. How would you classify the situation in part A if a reactor trip occurred while trying to restore annunciator power? (Include NRC Classification and State Posture Code) | | |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT-SRO

05/01/89

| Iten # | Ques \$ | Points | Question | Answer | Exam # RO:890012 |
|--------|---------|--------|---|--|--|
| 002055 | 1.0024 | 2.0 | Engineering discovers that the linear heat generation rate technical specification limit was exceeded on the monthly incore map. | 3.3/3.7 DIFF: 3 | |
| 003291 | 1.0025 | 2.0 | while the plant is operating at 88% power, the NIS Channel Deviation annunciator and the Rod Out of Step annunciator are both alarming. The Incore QPTR is calculated and results in a QPTR of 1.03. In response to the QPTR limits, the control room operators MUST perform which of the following? a. Calculate the QPTR each hour until it returns to within limits. b. Reduce thermal power to less than 50% within 2 hours. c. Reduce PR Overpower Trip setpoint to 91% within 4 hours. d. Immediately commence a power reduction and be in HOT STANDBY within 6 hours. | LP REF: L00604 K/A REF: RATING: 3.2/3.6 EO: 5 DIFF: 3 TIME: 4 MINUT | PROC REF: TS 3.17 |
| 003224 | 1.0026 | 1.3 | <pre>while the plant is operating at 100% power, the air operator for letdown containment isolation valve LD-AOV-230 develops a large air leak. To fix the leak, air must be secured to the valve operator. Chemistry has requested that maximum letdown be maintained because of high RCS activity levels. Maintenance suggests locking LD-AOV-230 open by placing a collar on the valve stem. Plant management agrees and grants approval for the work to start.</pre> a. How long can the plant remain in this | b. Isolate letdown by sh MOV 200 (.5) <u>or</u> Be and in LP REF: 87-6-L05 K/A REF RATING: 3.3/3.9 E0: 6 | utting letdown AOVs or Hot Standby in next 6 Hrs Shutdown within 30 hrs (5) : 0000696A9.0 K/A PROC REF: TS 3.11.6 |

configuration?

D. What must be done if the time limit is exceeded?

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NRC MASTER

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : SE 6 Examination Category : 1

Examinee : Examination Number : RO : 890007 Developed : CY/NRC STARS Date Administered : 5/4/89 Approved : 150 Akedee

Final Grade : ____

Instructions to the Examinee :

- 1. Talking during the examination is strictly forbidden.
- 2. If a question is not understood, raise your hand so that a proctor/examiner may assist you.
- 3. All required reference materials will be provided by the proctor/examiner.
- 4. Cheating in any form may result in a recommendation for disciplinary action.
- 5. Each examination response sheet shall be numbered by you. You shall write your name or initials on each examination response sheet.
- 6. The passing grade requires a final grade of at least 80%.
- 7. The total duration of this examination shall be 0.75 hours.

All work done on this examination is my own; I have neither given nor received aid.

Student's Signature

ATTACHMENT 1

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : SE 6

Examination Number : RO : 890007 Date Administered : 5/4/89

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| Category Value | % of Total | Student's Score | % of <u>Cat. Value</u> | Category | | |
|-------------------|---------------|--------------------|---------------------------|---------------------|----------|-------------|
| 25.0 | 100.00 | | | MINOR-#4 FAILURE | SG LEVEL | TRANSMITTER |
| 0.0 | 0.00 | | | | | |
| 0.0 | 0.00 | | | | | |
| 0.0 | 0.00 | | | | | |
| 25.0 | 100.00 | | | Totals | | |

Final Grade _____%

| Page | Page 1 WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : SE 6 S/4/89 | | | | | | | |
|--------|---|-----|---|--------------------------|--|--|--|--|
| Ques # | 1 | Pts | Question | Exam # : RO : 890007 | | | | |
| 1.0001 | 1 | 0.7 | What MCB alarm was a direct result of the transmitter failing high? | e S/G narrow range level | | | | |
| 1.0002 | 1 | 1.6 | What will trip the Reactor if no operator | actions are taken? | | | | |
| 1.0003 | / | 1.4 | During the transient MWe had increased to this occured. | o 650 MWe. Explain why | | | | |

1.0004 / 1.8 Given that steam line isolation will occur, will the RCS pressure drop be GREATER THAN, LESS THAN or THE SAME as a manual reactor trip from 100% power? Explain.

1.0005 / 1.0 Explain why charging flow has decreased.

1.0006 / 1.2 Explain why has the loop delta T for the affected S/G decreased?

1.0007 / 1.0 What turned on all PZR backup heaters?

1.0008 / 1.3 Indicate the procedural flow path from the point of reactor trip to the point of exit from the EOP network.Only indicate the procedure and the step at which a transition to another procedure will occur.

WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : SE 6

| ur | 20 | 5. 7 | CA:51 | | |
|----|----|------|-------|---|--|
| | m | 1a | 101 | 2 | |
| | 31 | T | 104 | 7 | |
| | | | | | |

| 2.1 | pressurizer which spray valve would be more effective. Justify your answer. |
|-----|---|
| 1.0 | valves stay open a shorter or longer period of time when compare |
| | |
| 1.4 | As the secondary side operator how would you have mitigated this malfunction at the time of the instrument failure. |
| 1.2 | Why is Channel 4 VLPT setpoint so low if its' Tavg input is so high? |
| | |
| 0.9 | Now are Channels 1, 2, & 3 VLPT setpoints affected by the following: (Increase, Decrease, No effect) |
| | a. Delta T |
| | b. PZR Pressure |
| | c. Tavg |
| | Why has steam flow increased on #1, 2, & 3 S/Gs? |
| | 1.2 |

N. Page 2

4

| Nuc | lear Tr | raining Department / Connecticut Yankee Operator Training Course Exam : SE 6 5/4/89 | |
|----------|---------|--|----------------|
| Ques # / | Pts | Question Exam # : RO : 8 | 390007 |
| 1.0015 / | 1.3 | Wny would opening #4 S/G FRV bypass valve have very little effect on mitigating this accident ? | 9 |
| 1.0016 / | 1.1 | Why have the levels in #1, 2, & 3 S/Gs increased? | |
| 1.0017 / | 1.0 | List 6 MCB individual indications where we can see an effort the decreased charging flow. | ect from |
| 1.0018 / | 1.1 | In which direction should rod motion be at this time? | |
| 1.0019 / | 1.1 | A. Just prior to the reactor trip, why were rods moving? B. Why is rod speed > 5 in. per minute? | |
| 1.0020 / | 0.8 | After the reactor trip how many FRV will open ? | |
| 1.0021 / | 1.0 | If the RO, were to open #4 FRV, the same amount as #1 ,2 would feed flow to #4 S/G be higher than to #1 ,2 & 3 S/G | & 3, wh s ? |

Nuclear Training Department / Connecticut Yankee Operator Training SE 6

| 100.1 | | Points | Guession | 100xer | \$ 00 10110T |
|--------|--------|--------|--|--|-----------------|
| 11-66 | 1.0061 | 2.7 | what MCB alarm was a direct result of the S.G. marrow range level transmitter failing high? | E-1-1-9 pr 13.5 Level Transmitt | er Signal High, |
| | | | | LD PER: C1+DP+LDCT+57-1-105 REF:059-000-42.11 | s. A |
| | | | | ELO REF: " Pating:3.0 3.8 | 7. Å |
| | | | | DIFF: 2 | PPOC REF. |
| | | | | Time: 1 minute | |
| 02757 | 1.0002 | 1.6 | What will trip the Reactor of no operator | High steam flow gt 110% or VLP | t (1.0) |
| | | | actions are taken? | _P REF:CY+OP+LOCT-87+5-\$87505 REF:000-041-EA2.02 | s. A |
| | | | | ELO REF | K'A RATING: |
| | | | | DIFF: 2 | NOC REF: |
| | | | | TIME: 2 MIN.TES | |
| 002768 | 1.0003 | 1,4 | During the transient Mwe had increased to 650 Mwe. Explain why this occured. | Main steam eader pressure incr increased in steam flow to th which incr ed turbine power Compensity opplied | e surbinel.331 |
| | | | | UP REFIC: LOCT-37-5-\$87505 REF:039-0141.08 | K. A |
| | | | | ELO REF: 2 3.0/3.1 | », A RATING: |
| | | | | DIFF: S | PROC REF: |
| | | | | TIME: 1 MINUTE | |

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WRITTEN EXAMINATION ANSWER NEY Ruclear Training Department Connecticut ankee Operator Training 36 5

| ten # | Ques 1 | Points | Question | -10x81 | 1480. 8 . 801881017 |
|--------|--------|--------|---|---|--|
| 02769 | 1.0004 | 1.8 | Given that steam ine iso actor will cooler will the RCS pressure crop be CPEATER THUN, LESS THAN or THE SAME as a manual reactor to b from COS power? Explain. | N trip 18 Because stee | <pre>m ine isolation *1 ifnus Tave and</pre> |
| | | | | concepts ap | plied |
| | | | | _0 PEF:CY+OP-LOCT+87-8- REF:C41-C2C-K3.C2 | 587505 K/A |
| | | | | ELO REF: 3 Pating:3.8/3.9 | K/A |
| | | | | 014F: 1 | |
| | | | | TIME: ' MINUTE | |
| | | | | | |
| 302770 | 1.0005 | 1.0 | Explain why charging flow has becreased. | Tave increases which caused pressurizer leve increase is nowever program level is limit or plippe at 50% level (.25) thus the controller but back charging flow to maintai level.(.25 | |
| | | | | LP REF:C | 1-105 K/A |
| | | | | ELO PEF: - | K/A RATING:3.1/3.3 |
| | | | | DIFF: 2 | |
| | | | | 1185: 1 MI - 11 | |
| | | | | | |
| 002771 | 1.0006 | 1.2 | Explain why has the loop be ta T for the affected S/G becreased? | Ine ievel decrease has available in the steam transfer or (due steam flow from heat removed , A system will de LP FEF: CI-IP-LOCT-81- 002020K5.15 | generator for neat |
| | | | | ELO REF: 4 3.8/4.1 | K/A RATING: |
| | | | | DIFF: 2 | |

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Nuclear Training Department (Connecticut Yankee Operator Training

SE 6

| en # | Ques # | Points | Question | Answer | Exam # R0:890007 |
|-------|--------|--------|--|---|-------------------------------|
| | 1.0007 | 1.0 | What turned on all P2R backup neaters? | PZR Level Channel 1 \rightarrow 52% o | r (PZR level high) |
| | | | | LP REF:CY-OP-LOCT-87-3-5873 011000K4.04 | 03 K/A REF: |
| | | | | ELD REF: 10 3.0/3.3 | K/A RATING: |
| | | | | DIFF: 2 | |
| | | | | TIME: 1 MINUTE | |
| 02773 | 1.0008 | 1.3 | 1.3 Indicate the procedural flow path from the point of reactor trip to the point of exit from the EOP network.Only indicate the procedure and the step at which a transition to another procedure will occur. | Transition to ES-0.1 (.33) ES-0.1 until step 17 (NOP 2 | 2.1-4) (.33) |
| | | | | LP REF:CV-09-LOCT-87-3-5873 REF:000-001-EK3.01 | 302 K/A |
| | | | | ELO REF: 11 RATING:4.1 4.5 | K/A |
| | | | | DIFF: 2 | |
| | | | | TIME: 3 MIN.TES | |
| | | | | | |
| 02774 | 1.0009 | 2.1 | Prior to the reactor trip if you were to manually spray the pressurizer which spray valve | Loop 3 spri fow (.5) woul e because the water is colde | d be more effective r (.5) |
| | | | would be more effective. Justify your answer. | LP REF: CYLOCT-88-4-L88 REF:035-010-+3.01 | 403 K/A |
| | | | | ELD REF: 2 RATING:4.4 4.6 | K/A |
| | | | | DIFF: 3 | |
| | | | | TIME: 1 MINUTE | |

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Nuclear Training Department / Connecticut Yankee Operator Training

SE 6

| item # | Ques # | Points | Question | Answer | Exam # R0:890007 |
|--------|--------|--------|--|---|---|
| 02775 | 1.0010 | 1.0 | Upon the reactor trip from this event will the feed regulating valves stay open a shorter or longer period of time when compared to a manual reactor trip. Explain your answer. | time.(.25) Because Ta | ve will remain higher than r period of time. (.75) ie.d |
| | | | | ELO REF: 13 3.0/3.1 | K/A RATING: |
| | | | | DIFF: 2 | |
| | | | | TIME: 2 MINUTES | |
| | | | | | į |
| 002776 | 1.0011 | 1.4 | As the secondary side operator now would you have mitigated this malfunction at the time of the instrument failure. | Take manual control c (1.0)LP REF: S87304 REF:059-000-42.11 | of the feed reulating valve. ED: 3 K/A |
| | | | | TIME: 1 MINUTE RATING:3.1 1.3 | K/A |
| | | | | DIFF: 3 | |
| 003488 | 1.0012 | 1.2 | Why is Channel 4 VLPT setpoint so low if its' Tavg input is so high? | It's deita T componen with an olerciding ef | nt dropped significantly |
| | | | | LP REF: SET.34 K/A F RATING: 3.7 1.8 EO: DIFF: 2 T E: 1 MIN | |
| | | | | | |
| 003489 | 1.0013 | 0,9 | How are Channels 1, 2, 4 3 VLPT setpoints affected by the following: (Increase, Decrease, | a. Increase (.33) | |
| | | | No effect) | <pre>D. NO affect (.33)</pre> | |
| | | | a. Delta T | c. Increase (.33) | |
| | | | b. PZR Pressure | 2.9/2.9 50: 3 | EF: 012000K6.11 K/A RATING PROC REF: DIFF: 1 |
| | | | c. Tavg | TIME: 2 MINUTES | |

Nuclear Training Department / Connecticut Yankee Operator Training

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SE 6

| ten # | Ques # | Points | Quession | Answer Exam # RO;8 | 90007 |
|--------|--------|--------|---|---|------------------|
| 03498 | 1.0014 | 1.0 | Why has steam flow increased on #1. 2. & 3 S/Gs? | Three Steam Generators trying to supply amount of steam as four Steam Generatory Concepts applied) | the same s. (|
| | | | | LP REF: S87304 K/A REF: 035010A2.05 K RATING: 3.2/3.4 EO: 3 PROC REF: DIFF: 2 TIME: 1 MINUTES | /A |
| 003491 | 1.0015 | 1.3 | Why would opening #4 S/G FRV pypass valve have very little effect on mitigating this accident ? | Bypass flow will not support steam dema this power. (1.0) | ind for |
| | | | | LP REF: S07304 K/A REF: D00054EA2.06 RATING: 4.0/4.3 EO: 3 PROC REF: DIFF: 2 TIME: 1 MINUTES | K/A |
| 003492 | 1.0016 | 1.1 | Why have the levels in #1, 2, \$ 3 5/Gs increased? | The effects of swell (due to higher sto rate) | eaming |
| | | | | LP REF: S87304 K/A REF: 035010A2.03 RATING: 3.4/3.6 EO: 3 PROC REF: DIFF: 2 TIME: 1 MINUTES | K/A |
| 003493 | 1.0017 | 1.0 | List 6 MCB individual indications where we can see an effect from the decreased charging flow. | Any 6 from this list. (.166 ea.) | |
| | | | | . VCT le si . VCT pressure | |
| | | | | . Chg Header Pressure . Chg Pc -mps . L/D Reg Hx Outlet Temp | |
| | | | | . Chg Temp Regen Hx outlet | |
| | | | | . Chy flow indication loop 2 | |
| | | | | PZR pressure VCT Rate of Change | |
| | | | | LP REF: 87-2-LO6 K/A REF: 004000A1.08 RATING: 3.0/3.0E0: 1 PROC REF: DIFF: 2 TIME: 1 MINUTES | K/A |

Nuclear Training Department / Connecticut Yankee Operator Training

SE 6

| 1.0018 | 1,1 | In which direction should rob motion be at this time? | Inward |
|--------|--------|--|--|
| | | | LP REF: SS1304 K/A REF: D01000K4.03 K/A RATING: 3.5/3.8 EO: 3 PROC REF: DIFF: 2 TIME: 1 MINUTES |
| 1.0019 | 1.1 | A. Just prior to the reactor trip, why were rods moving? | A. Tavg Tref deviation ()1.5 deg F) (0.5) B. Pressure compensation (NI. compensation (0.5) (articapatory signals) |
| | | B. Why is rod speed > 5 in. per minute? | LP REF: S87304 K/A REF: 001000K4.03 K/A RATING: 3.5/3.8 EO: 3 PROC REF: DIFF: 2 TIME: 1 MINUTES |
| 1.0020 | 0.8 | After the reactor trip now many FRVs. will open ? | 4 (1.0 |
| | | | LP REF: 3:114 K/A REF: 059000K4.17 K/A RATING: 2:5 2:8 E0: 3 PROC REF: DIFF: 2 TIME: MINUTES |
| 1.0021 | 1.0 | If the RO, were to open #4 FRV, the same amount as #1 .2 & 3, why would feed flow to #4 5/6 te higher than to #1 .2 & 3 5/6s ? | #4 5/6 pressure is less than the other thra Flow take the path of least restance or as proport as to the square of the D/P .) |
| | | | LP REF: Sa .4 K/A REF: 059000A2.11 K/A PATING: 3. 1.3 EO: 3 PROC REF: DIFF: 2 THE: MINUTES |
| | 1.0020 | 1.0020 0.8 | moving? B. Why is rod speed > 5 in. per minute? 1.0020 0.8 After the reactor trip how many FRVs. will open ? 1.0021 1.0 If the RO, were to open #4 FRV, the same amount as #1 .2 & 3, why would feed flow to #4 5/6 ce |

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NRC MASTER

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : LORT SE-6a Examination Category : 1

Examinee : Examination Number : RO : 890017 Developed : CY/NRC STARES Date Administered : 5/4/89 Approved : Bal Herdenher N.T.D. Supervisor

| F | ٦ | na | al | G | ir | a | de | 3 | | |
|---|---|----|----|---|----|---|----|---|--|--|
| | | | | | | | | | | |

Instructions to the Examinee :

- 1. Talking during the examination is strictly forbidden.
- 2. If a question is not understood, raise your hand so that a proctor/examiner may assist you.
- All required reference materials will be provided by the 3. proctor/examiner.
- 4. Cheating in any form may result in a recommendation for disciplinary action.
- 5. Each examination response sheet shall be numbered by you. You shall write your name or initials on each examination response sheet.
- The passing grade requires a final grade of at least 80%. 6.
- 7. The total duration of this examination shall be 0.75 hours.

All work done on this examination is my own; I have neither given nor received aid.

Student's Signature

ATTACHMENT 1

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : LORT SE-6a

Examination Number : RO : 890017 Date Administered : 5/4/89

| Category Value | % of Total | Student's Score | % of <u>Cat. Value</u> | Category |
|-------------------|---------------|--------------------|---------------------------|----------|
| 25.0 | 100.00 | | | |
| 0.0 | 0.00 | | | |
| 0.0 | 0.00 | | | |
| 0.0 | 0.00 | | | |
| 25.0 | 100.00 | | | Totals |
| | | Final Grade | 9 | 6 |

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WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT SE-6a

| Ques # / | Pts | Question | Exam # : RO : 890017 |
|----------|-----|---|-------------------------------------|
| 1.0001 / | 1.1 | As the secondary side operator how would y malfunction at the time of the instrument | you have mitigated this failure. |
| 1.0002 / | 1.2 | Why is Channel 4 VLPT setpoint so low if i high? | its' Tavg input is so |
| 1.0003 / | 0.9 | How are Channels 1, 2, & 3 VLPT setpoints following: (Increase, Decrease, No effect) | affected by the) |
| | | a. Delta T b. PZR Pressure | |
| | | c. Tavg | |
| 1.0004 / | 1.0 | Why has steam flow increased on #1, 2, & 3 | 3 S/Gs? |
| 1.0005 / | 1.3 | Why would opening #4 S/G FRV bypass valve effect on mitigating this accident | have very little |

1.0006 / 1.1 Why have the levels in #1, 2, & 3 S/Gs increased?

| | | 1 1 | |
|----------|-----|---|--|
| Ques # / | Pts | Question Exa | am # : RO : 890017 |
| 1.0007 / | 1.0 | List 6 MCB individual indications where we can the decreased charging flow. | n see an effect from |
| 1.0008 / | 1.1 | In which direction should rod motion be at the | is time? |
| 1.0009 / | 1.1 | A. Just prior to the reactor trip, why were ro B. Why is rod speed > 5 in. per minute? | ods moving? |
| 1.0010 / | 0.8 | After the reactor trip how many FRVs. will op | en ? |
| 1.0011 / | 1.0 | If the RO. were to open #4 FRV. the same amoun would feed flow to #4 S/G be higher than to # | nt as #1 ,2 & 3, wh 1 ,2 & 3 S/Gs ? |
| 1.0012 / | 1.0 | What MCB alarm was a direct result of the S/G transmitter failing high? | narrow range leve |
| 1 0012 / | 1.6 | What will trip the Reactor if no operator act | ions are taken? |

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WRITTEN EXAMINATION

Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT SE-6a

| Ques # / | Pts | Question Exam # : | RO : 890017 |
|----------|-------|--|-------------------------|
| 1.0014 / | 1.4 | During the transient MWe had increased to 650 MWs. E this occured. | xplain why |
| 1.0015 / | 1 . 8 | Given that steam line isolation will occur, will the drop be GREATER THAN, LESS THAN or THE SAME as a man trip from 100% power? Explain. | |
| 1.0016 / | 1.0 | Explain why charging flow has decreased. | |
| 1.0017 / | 1.2 | Explain why has the loop delta T for the affected S/ | G decreased? |
| 1.0018 / | 1.0 | What turned on all PZR backup heaters? | |
| 1.0019 / | 1.3 | Indicate the procedural flow path from the point of to the point of exit from the EOP network.Only indic procedure and the step at which a transition to anot will occur. | ate the |
| 1.0020 / | 2.1 | Prior to the reactor trip if you were to manually sp pressurizer which spray valve would be more effectivy your answer. | oray the ve. Justify |

Page 4 WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT SE-6a / /

Ques # / Pts Question

1

Exam # : RO : 890017

1.0021 / 1.0 Upon the reactor trip from this event will the feed regulating values stay open a shorter or longer period of time when compared to a manual reactor trip. Explain your answer.

WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department Connecticut rankee Operator Training LORT SE-6a

| ten # | 2.05 4 | Points | Question | ATEWS! | Exam.4.80:390017 |
|---------|--------|--------|---|--|---|
| 02776 | 1.0001 | 1.* | As the vecondary side operator now would you nave mitigated this ma function as the time of the instrument failure. | Texe manur control p 1.012P REF: 587304 PEF:559-000-A2.11 | f the feed reulating valve. ED: 1 |
| | | | | TIME: 1 MINUTE RATING:3.0/3.3 | s. k |
| | | | | 01FF: 3 | |
| | | | | | |
| 303488 | 1.0002 | 1.2 | why is Channel 4 VLPT setpoint so low if its' Tavg input is so high? | It's deita T componen with an overriding af | it dropped significantly fect. |
| | | | | LP REF: 507304 K/A F RATING: 3.7/3.8 EO: DIFF: 2 TIME: 1 MINU | 3 PROC REF: |
| | | | | | |
| 003489 | 1.0003 | 0,9 | How are Channels 1. 2. & 3 VLPT setsoints affected by the following: Increase, Decreise. | a. Increase (.33) | |
| | | | No effect/ | b. No affect (.33) | |
| | | | a. Deita T | c. Increase (.33) | |
| | | | b. PIR Pressure | 2,9/2.9 9 3 | EF: 012000K6.11 K/A RATING: PROC REF: DIFF: 2 |
| | | | c. Tavg | TIME: 2 VI .TES | |
| | | | | | |
| 00.3498 | 1.0004 | 1.0 | why has steam flow increased on \$1. 2. 8 3 5/6s | 2 Three Stear Generato amount of iteam as f Concepts accided (| rs trying to supply the same our Steam Generators. (|
| | | | | UP REF: BETIOK K/A Rating: 3.1 3.4 ED: DIFF: 2 TIME: 1 MJ | |

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WRITTEN EXAMINATION ANSwER KEY Nuclear Training Department Connecticut Varkee Operator Training LOPT SE-6a

| en # | Ques # | Points | Question | 41948r |
|-------|--------|--------|--|--|
| 3491 | 1.0005 | 1.3 | Why would opening #4 5 3 PP bycass value have very little effect on mitigating this accident ? | Bloass flow with out succord staam cemand fo this power. It : |
| | | | | LP REF. BETICLE - & REP. COICE4EA2 CB -* A Rating: 4.014 B EC. B - PROC REF. Cirr: 2 Time: 7 MinuteB |
| 3492 | 1.0006 | 1,1 | Why have the levels in #1. 2. 4.3.8.3s increased? | The effects of swell one to higher steaming nate: |
| | | | | Lº REF: BUT304 x.4 REF: 03501042.03 K/A RATING: 2.4/3.6 EO: 3 PROC REF: DIFF: 2 TIME: 1 MINUTES |
| 3493 | 1.0007 | 1.0 | List 6 MCB individual indications where we can see an effect from the decreased charging flow. | PIR e.e VCT Nete1 VCT pressure Cng Het er Pressure Ong Politics LVD Rei - Outlet Temp Ong Tel Reger Hx Sutlet |
| | | | | Labyr De'tz P indications Ong F Horistion loop 2 Ong F Horistion controller's) PCP D Life VCT rate of change LP REFI ST 1.28 K 4 REF: D3400041.08 K/A RATING: D LICEO: PROC REF: DIFF: 2 E. MINUTES |
| 03494 | 1.0008 | 1.1 | In which direction should not motion be at this time? | Inward |
| | | | | LP REF: SST314 K/A REF: SO1000K4.C3 K/A Rating: 1.5 3.8 EO: 3 PROC REF: SIFF: 2 TOPE: 1 Minutes |
| | | | | |

WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-6a

| ten \$ | Ques # | Points | Question | Answer | Exam # R0:890017 |
|---------|--------|--------|--|---|--------------------------|
| 03495 | 1.0009 | 1.1 | A. Just prior to the reactor trib, why were roos moving? | A. Tavg Tref deviation (B. Pressure compensation (0.5) (antiangator) | (NI. compensation) |
| | | | B. Why is rod speed is in. per minute? | LP REF: S87304 K/A REF: RATING: 3.5/3.8 EO: 3 DIFF: 2 TIME: 1 MINUTE | PROC REF: |
| 03496 | 1.0010 | 0.8 | After the reactor trip now many FRVs. will open ? | 4 (1.0) | |
| | | | | LP REF: S87304 K/A REF: RATING: 2.5/2.8 EO: 3 DIFF: 2 TIME: 1 MINUTES | PROC REF: |
| 10:3497 | 1.0011 | 1.0 | If the RO, were to open 44 FRV, the same amount as #1 .2 & 3, why would feed flow to #4 B/G be higher than to #1 .2 & 3 S/Gs ? | #4 S/G pressure is less (Flow takes the path of is proport shall to the s | least restiance or Flow |
| | | | | LP REF: 587104 K/A REF RATING: 8.1 2.3 EO: 3 DIFF: 2 TIME: 1 MINUTER | PROC REF: |
| J0276€ | 1.0012 | 1.0 | What MCB alarm was a direct result of the 5/3 narrow range level transmitter failoing high? | E-1-1-9 cr S/G Level | Transmitter Signal High. |
| | | | | LP REF: 0 -12-LOCT-87- REF:059-0042.11 | 1-105 K/A |
| | | | | ELO REF: " PATING:3.0 1.2 | К/А |
| | | | | DIFF: 2 | PROC REF: |
| | | | | Time: 1 minute | |

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Nuclear Training Department / Connecticut Yankee Operator Training

LORT SE-68

| ten # | Ques # | Points | Question | Answer | Exam # R0:89001) |
|--------|-------------|--------|---|---|--|
| 02767 | 1.0013 | 1.6 | What will trip the Reactor of no operator | High steam flow gt 110% o | r VLPT (1.0) |
| | | | actions are taken? | LP REF:CY-OP-LOCT-87-5-58 REF:000-040-EA2.02 | 7505 K/A |
| | | | | ELO REF: 4 4.6/4.7 | K/A RATING |
| | | | | DIFF: 2 | PROC REF: |
| | | | | TIME: 2 MINUTES | |
| 02768 | 2768 1.0014 | | During the transient MWe had increased to 650 MWe. Explain why this occured. | Wain steam header pressure increased main steam flow which increased turbine po Concepts app | to the turbine(.33) ower(.33) |
| | | | | LP REF: C'-CP-LOCT-87-5-58 REF: 039-000-41.06 | 7505 K/A |
| | | | | ELO REF: 2 3.0/3.1 | K/A RATING: |
| | | | | DIFF: 3 | PROC REF: |
| | | | | TIME: 1 MI1.TE | |
| 002769 | 1.0015 | 1.8 | Given that steam line isolation will occur, will the RCS pressure drop be GREATER THAN, LESS THAN or THE SAME as a manual reactor trip from 100% power? Explain. | trip 1.26 scause steam | (Thus Tave and 11 not drop as far.) |
| | | | | LP REF:CY-09-LOCT-87-5-58 REF:D41-020-x3.02 | 17505 K/A |
| | | | | ELO REF: 3 RATING:3.8/3.9 | K/A |
| | | | | DIFF: 3 | |
| | | | | TIME: 1 MINUTE | |
| | | | | | |

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Nuclear Training Department / Connecticut Yankee Operator Training

LORT SE-68

| ten 1 | Ques f | Points | Question | Answer | Exam # R0:890017 |
|-------|--------|--------|--|--|------------------------------------|
| 02770 | 1.0016 | 1.0 | Explain why charging flow has becreased. | Tave increased which caused increase (.5) however progri or clipped at 50% level (.2 controller cut back chargin level.(.25) | am level is limited 5) thus che |
| | | | | LP REF:CY-OP-LOCT-87-1-L05 REF:011-000-41.04 | K/A |
| | | | | ELO REF: 7 | K/A RATING:3.1/3.3 |
| | | | | DIFF: 2 | |
| | | | | TIME: 1 MINUTE | |
| 02771 | 1.0017 | 1.2 | Explain why has the loop delta T for the affected S/G decreased? | The level cecrease has redu available in the steam gene transfer. 1.01 or (due to from "4 Steam Cenerat from the primary sys Concepts appli LP REF: C 00-1007-87-5-587 002020K5.08 | |
| | | | | ELO REF: 4 3.8/4.1 | K/A RATING: |
| | | | | DIFF: 2 | |
| | | | | TIME: 1 MIL.TE | |
| 02772 | 1.0018 | 1.0 | What turned on all PZR backup heaters? | PZR Level : annel 1 > 52% (| or (PZR level high) |
| | 1,0010 | | | LP REF:CY-02-LOCT-87-3-5870 011000K4.0- | |
| | | | | ELO REF: 12 3.0/3.3 | K/A RATING: |
| | | | | DIFF: 2 | |
| | | | | TIME: 1 MINUTE | |

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Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-6a

| tem # | Ques 1 | Points | Question | Answer | Exam # R0:890017 |
|--------|--------|--------|--|--|---|
| 02773 | 1.0019 | 1.3 | Indicate the procedural flow path from the point of reactor trip to the point of exit from the EOP network.Only indicate the procedure and the step at which a transition to another procedure will occur. | Transition to ES-0. ES-0.1 until step 1 or ES-0.1 STEP 10 t LP REP:CY-OP-LOCT-8 | 1 (.33) 7 (NOP 2.1-4) (.33) 0 loss of vacuum. |
| | | | | REF:000-007-EK3.01 | |
| | | | | ELO REF: 13 RATING:4.0/4.6 | K/A |
| | | | | DIFF: 2 | |
| | | | | TIME: 3 MINUTES | |
| | | | | | |
| 002774 | 1.0020 | 2.1 | Prior to the reactor trip if you were to manually spray the pressurizer which spray valve | Loop 3 spray fow (because the water | .5) would be more effective is colder (.5) |
| | | | would be more effective. Justify your answer. | LP REF: C1-3P-LOCT-1 REF: 035-010-43.01 | 88-4-188403 K/A |
| | | | | ELO REF: 1 RATING:4.4 4.5 | K/A |
| | | | | DIFF: 3 | |
| | | | | TIME: 1 MINUTE | |
| | | | | | |
| 002775 | 1.0021 | 1.0 | Upon the reactor trip from this event will the feed regulating valves stay open a shorter or longer period of time when compared to a manual reactor trip. Explain your answer. | time.1.25 Fecause 545 Deg Filir a lo Concepts a | n a longer period of Tave will remain nigher than inger period of time. (.75) applied 187-3-587302 - K/A REF: |
| | | | | ELO REF: 13 3.0/3.1 | K/A RATING: |
| | | | | DIFF: 2 | |
| | | | | TIME: 2 MINUTES | |
| | | | | | |

NRC MASTER

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : LORT SE-9a Examination Category : 1

Examinee : ______ Final Grade : ______ Examination Number : RO : 890015 Developed : <u>CY/NRC STAFFS</u> Date Administered : / / Approved : <u>Bob Hellulu</u> N.T.D. Supervisor

Instructions to the Examinee :

- 1. Talking during the examination is strictly forbidden.
- 2. If a question is not understood, raise your hand so that a proctor/examiner may assist you.
- All required reference materials will be provided by the proctor/examiner.
- 4. Cheating in any form may result in a recommendation for disciplinary action.
- Each examination response sheet shall be numbered by you. You shall write your name or initials on each examination response sheet.
- 6. The passing grade requires a final grade of at least 80%.
- 7. The total duration of this examination shall be 0.75 hours.

All work done on this examination is my own; I have neither given nor received aid.

Student's Signature

ATTACHMENT 1

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : LORT SE-9a

Examination Number : RO : 890015 Date Administered : / /

1

4

| Category Value | % of <u>Total</u> | Student's Score | % of <u>Cat. Value</u> | Category | |
|-------------------|----------------------|--------------------|---------------------------|----------|--|
| 25.0 | 100.00 | | | | |
| 0.0 | 0.00 | | | | |
| 0.0 | 0.00 | | | | |
| 0.0 | 0.00 | - | | | |
| 25.0 | 100.00 | | | Totals | |
| | | Final Grad | e % | | |

WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT SE-9a

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| | | |
| | | |
| | | |

| Ques # | 1 | Pts | Question Exam # : RO : 890015 |
|--------|---|-----|---|
| 1.0001 | 1 | 1.0 | Why have the RCP labrynith seal d/p indications decreased ? |
| 1.0002 | 1 | 1.0 | List two different indications that confirm that the turbine has tripped. |
| 1.0003 | 1 | 1.3 | List four of the RPS trip signals present up to now that should alone been able to trip the reactor. |
| | | | |
| 1.0004 | 1 | 1.4 | Classify the event. A manual reactor tripped has been attempted (Assume all efforts have been attempted to trip the RX and were unsuccessful .) |
| 1.0005 | 1 | 1.3 | The primary RO upon receipt of RCS Low Flow at 100% pwr and noticing the RX did not trip pushed the RX trip button. Is the RX in the process of tripping at this time. Explain. |
| 1.0006 | 1 | 0.8 | List two indications that #4 RCP did not trip ? |
| 1.0007 | / | 1.4 | The RCP Low Flow alarm was due to which of the following events A. Undervoltage B. Bkr opening C. Rotor Shear D. Seized Rotor |

Page 1

1

2 WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training

Course Exam : LORT SE-9a

| Ques # / | Pts | Question | Exam # : RO : 890015 |
|----------|-----|---|--|
| 1.0008 / | 1.3 | For the following parameters indicat than, lower than or the same if this conditions. a. RX pwr b. Tavg | |
| 1.0009 / | 1.3 | The SRO based on feedback from his on have completed E-O am transiting to should he be in at this time. | |
| 1.0010 / | 2.0 | List 3 different methods that could in the control room to shutdown the Reactor trip buttons have been pushe | Reactor? (Assume both |
| 1.0011 / | 1.1 | Steam line isolation occurred on his how loss of flow in loop 4 led to th | gh stm flow Delta P. Explair his condition. |

1.0012 / 1.4 Determine the status of the four feed regulating valves and explain any differences.

1.0013 / 1.2 After verifying >320 gpm AFW flow what effect, if any, would the RO have on S/G level if he shuts the feed line MOVs and leaves them shut. Assume no other changes to plant conditions take place.

Page 2

WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT SE-9a

11

| Ques # | 1 | Pts | Question | Exa: # : RO : 890015 |
|--------|---|-----|--|---|
| 1.0014 | 1 | 0.8 | Why are all four feed regulating valve the controllers indicating 0% output? | auto control signals on |
| 1.0015 | 1 | 1.4 | Why is PZR level setpoint 50% at this t | ime? |
| 1.0016 | , | 1.0 | Why is charging flow at a minimum? | |
| 1.0017 | 1 | 2.0 | Neglecting the effects of control rods controlling Reactorpower ? | , What is presently |
| 1.0018 | 1 | 1.4 | Using all loop Taves calculate the actu | ual plant tavg? |
| 1.0019 | 1 | 0.8 | Why were Pzr. spray valves ineffective pressure transient prior to the turbine | in mitigating the RCS. e trip? |
| 1.0020 | , | 1.1 | A. Which RCS loops have reverse flow? B. Which RCS loops will develop revers automatic actions associated with the r | se flow? Assume all turbine trip occurs. |
| | | | | |

| Page 1 | | | WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee (LORT SE-9a / / | Operator Training | |
|--------|--------|--------|--|---|--|
| lten # | Ques # | Ppints | Question | Answer | Exam # R0:890015 |
| 003452 | 1.0001 | | why have the RCP lebrymith seal d.p. indications recreased ? | RCS pressure has that of seal supp | increased. (to greater than ly) (1.0) |
| | | | | LP REF:87-2-106 RATING: 3.6/3.8 | N/A REF: 004000A1.03 K/A |
| | | | | EO: TLO DIFF:2 TIME: 2 | PROC REF: MINUTES |
| 003451 | 1.0002 | 1.0 | List two different indications that confirm that the turbine has tripped. | Stop valves shut Gov valves shut Low auto stop oil (.5 each) | pressure |
| | | | | RATING: 3.4/3.6 | 2 K/A REF:04500DA3.04 K/A PROC REF:E-0 1 MINUTES |
| 003450 | 1.0003 | 1.3 | List four of the RPS trip signals present up to now that should alone been able to trip the reactor. | | ves shut |

(.25 each) RCP BKr OPEN. LP REF:87-5-587501 K/A REF:000007EA2.02 K/A RATING: 4.3 4.6

High steam " OW 110% 2 of 4

EO:3 PROC REFIERO DIFF:2 TIME: IMINUTES FOW RCS FILM ZOF 4/23;

Nuclear Training Department / Connecticut Yankee Operator Training

LORT SE-9a

| ten # | Ques # | Points | Question | Answer Exa | m # R0:65 15 |
|--------|--------|--------|---|---|---|
| 003449 | 1.0004 | 1.4 | Classify the event. A manual reactor tripped has been attempted. (Assume all efforts have been attempted to trip | | |
| | | | the RX and were unsuccessful .) | LP REF:EP-l10 K/A REF:0000206 RATING:3.1/4.3 EC: 7 PRO DIFF: 3 TIME: 1 MINUTES | |
| | | | | | |
| 02924 | 1.0005 | 1.3 | The primary RO upon receipt of RCS Low Flow at 100% pwr and noticing the RX did not trip pushed the RX trip button. Is the RX in the process of | | t (0.5) |
| | | | tripping at this time. Explain. | LP REF: CY-OP-LCCT-87-5-587503 000-029-EA2.07 | K/A REF: |
| | | | | E. OBJ: #7 4.2/4.3 | K/A RATING |
| | | | | DIFF: 2 REF: | PROCEDURE |
| | | | | TIME:1 minute | |
| | | | | | |
| 02925 | 1.0006 | 0.8 | List two indications that #4 RCP did not trip ? | BKR. ind. Red light) (.5) Put | np amps . (.5) |
| 02925 | 1.0006 | Q.8 | List two indications that #4 RCP did not trip ? | LP REF: COP-LOCT-87-3-\$8730 | |
| 02925 | 1.0006 | 0.8 | List two indications that #4 RCP did not trip ? | LP REF: C+-OP-LOCT-87-3-56730 003-000-43.32 E. OBJ: #5 | |
| 002925 | 1.0006 | 0.8 | List two indications that #4 RCP did not trip ? | LP REF: C:-OP-LOCT-87-3-587301 003-000-A3.32 E. 08J: #5 2.6/2.5 DIFF: 2 REF: | K/A REF: |
| 002925 | 1.0006 | 0.8 | List two indications that #4 RCP did not trip ? | LP REF: C:-OP-LOCT-87-3-587301 003-000-A3.32 E. OBJ: #5 2.6/2.5 DIFF: 2 | K/A REF: K/A RATING |
| | | | The RCP Low Flow alarm was due to which of the | LP REF: C:-OP-LOCT-87-3-587301 003-000-A3.32 E. OBJ: #5 2.6/2.5 DIFF: 2 REF: TIME:1 minute | K/A REF: K/A RATING |
| | | | The RCP Low Flow alarm was due to which of the following events: | LP REF: C:-OP-LOCT-87-3-587301 003-000-A3.32 E. OBJ: #E 2.6/2.5 DIFF: 2 REF: TIME:1 minute (Rotor Shear) C (1.0) LP REF: CY-OP-LOCT-87-3-587305 | K/A REF: K/A RATING |
| | | | The RCP Low Flow alarm was due to which of the | LP REF: C:-OP-LOCT-87-3-587301 003-000-A3.02 E. OBJ: #5 2.6/2.5 DIFF: 2 REF: TIME:1 minute (Rotor Shear) C (1.0) LP REF: CY-OP-LOCT-87-3-587305 DDD-015-EA2.01 E. OBJ: #5 | K/A REF: K/A RATING PROCEDURE |
| 002925 | | | The RCP Low Flow alarm was due to which of the following events: A. Undervoltage | LP REF: C:-OP-LOCT-87-3-587301 003-000-A3.32 E. OBJ: #E 2.6/2.5 DIFF: 2 REF: TIME:1 min_18 (Rotor Shear) C (1.0) LP REF: CY-OP-LOCT-87-3-587305 000-015-EA2.01 | K/A REF: K/A RATING PROCEDURE K/A REF: |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training

LORT SE-9a

| lten # | Ques # | Points | Question | Answer Exam # | R0:890015 |
|--------|--------|--------|---|--|--|
| 002939 | 1.0008 | 1.3 | For the following parameters indicate if they would be higher than, lower than or the same if this accident had occurred at EOL conditions. | | |
| | | | a. RX pwr b. Tavg | LP REF: CY-OP-LOCT-88-4-L88402 000-029-EK1.01 E. OBJ: #16 2.8/3.1 DIFF: 3 REF: TIME: 1 minute | K/A REF: K/A RATING: PROCEDURE |
| 102938 | 1.0009 | 1.3 | The SRO based on feedback from his operators has told the SS 'I have completed E-O am transiting to ES-D.1.' What procedure should he be in at this time. | | K/A REF: K/A RATING: PROCEDURE |
| 002937 | 1.0010 | 2.0 | List 3 different methods that could be taken at this time in the control room to shutdown the Reactor? (Assume both Reactor trip buttons have been pushed.) | Drive Rods. Emergency boration.Oper 4971 Bkrs Trip turpine. 1.33 each-3 LP REF: C DP-LOCT-87-5-587503 DOD-028-EK 12 E. OBJ: = 4.4/4.7 D3FF: S REF: TIME:1 minute | BUS 4841 & regd) K/A REF: K/A RATING PROCEDURE |

Page 3

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| Perge 4 | • | | WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-9a / 7 | | | |
|---------|--------|--------|--|---|-------------------------------|--|
| item # | Ques # | Points | Question | Answer | Exam # R0:890015 | |
| 002936 | 1.0011 | 1.1 | Steam line isolation occurred on high stm flow Delta P. Explain how loss of flow in loop 4 led to this condition. | decreased stm flow w | | |
| | | | | LP REF: CY-OP-LOCT | -88-4-188403 K/A RATING: | |
| | | | | 003-000-K3.02 E. OBJ: #2 3.5/3.8 DIFF: 2 TIME:2 minutes | K/A RATING: | |
| 002933 | 1.0012 | 1.4 | Determine the status of the four feed regulating valves and explain any differences. | | of high level override at 69% | |
| 002934 | 1.0012 | 1.2 | After verifying >320 gpm AFW flow what effect, if any, would the RO have on S/G level if he shuts the feed line MOVs and leaves them shut. Assume no other changes to plant conditions take place. | out of the 5 Gs (1. | | |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-9a

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| tem # | Ques # | Points | Question | Answet | Exam # R0:890015 |
|-------|--------|--------|--|---|---|
| 02935 | 1.0014 | D.8 | Why are all four feed regulating valve auto control signals on the controllers indicating O% output? | The output signal is contri setpoint, and this is based level, \$1,2 & 3 SF is low thus all four output signa (Concept applied) | d upon SF/FF & S/G (.5) #4 Level is high |
| | | | | LP REF: CY-OP-LOCT-87-5-S 059-000-K4.18 | 87503 K/A REF: |
| | | | | E. OBJ: #6 | K/A RATING: |
| | | | | 2.8/3.0 DIFF: 2 REF: TIME:3 minutes | PROCEDURE |
| | | | | | |
| 2932 | 1.0015 | 1.4 | Why is PZR level setpoint 50% at this time? | Level ref is clipped at 56 are in remote auto (1.0) | |
| | | | | are in remote auto (1.0) | 7302 K/A REF: |
| | | | | 011-000-A1.04 E. OBJ: #5 | K/A RATING: |
| | | | | 3.1/3.3 DIFF: 3 REF: TIME:1 minute | PROCEDURE |
| | | | | | ment union (1.6) |
| 2931 | 1.0016 | 1.0 | Why is charging flow at a minimum? | PZR level exceeding progre | |
| | | | | 011-000-KE 13 | K/A |
| | | , | | E. OBJ: #6 RATING: 3.2/3.4 Diff: 2 | N/# |
| | | | | PROCEDURE REF: TIME:1 minute | |
| | | | | or Par level in new 1) R. Reeves | note manual ter |
| | | | | z) m white | |
| | | | | 3) R Brown | |
| | | | | 4) M Basa 5) C. Cannella | |
| | | | | 6) J Banks | |

| Pargie 6 | | | WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-9a / / | | | |
|----------|--------|--------|---|--|--|--|
| Item # | Ques # | Points | Question | Answer | Exam # R0:890015 | |
| 062930 | 1.0017 | 2.0 | Neglecting the effects of control rods , what is presently controlling Reactorpower ? | Feed flow and S/G safeties a pwr. (0.5 each) concepts mrc, Frc, uoids | ere controlling RX | |
| | | | | LP REF: CY-OP-LOCT-87-5-587 | 1603 K/A REF: . | |
| | | | | 000-029-EA2.01 E. OBJ: #7 4.4/4.7 | K/A RATING: | |
| | | | | DIFF: 3 REF: TIME:2 minutes | PROCEDURE | |
| | | | | | | |
| | | | | | | |
| 002929 | 1.0018 | 1.4 | Using all loop Taves calculate the actual plant tavg? | Loop \$1 + Loop \$2 + loop \$ devided by four. Value to 1 day of exam +/- 5 Deg F. 5 degrees 7 (.5) | 3 + Loop \$4 Tave. be determined on the | |
| | | | | LP REF: CY-OP-LOCT-87-5-58 | 75D3 K/A REF: | |
| | | | | 000-017-EA1.09 E. OBJ: ≉6 RATING: 3.2/3.2 | K/A | |
| | | | | DIFF: 3 PROCEDURE REF: | | |
| | | | | TIME: 2 minutes | | |
| | | | | 585 + 586 + 584 + 1 | = 572 | |
| 002928 | 1.0019 | D.8 | Why were Pzr. spray valves ineffective in mitigating the RCS. pressure transient prior to | Short cycling (No flow in 1 | | |
| | | | the turbine trip? | LP REF: C:-OP-LOCT-87-5-SE | | |
| | | | | 000-029-641.01 E. OBJ: #T RATING: 2.8/3.1 | K/A | |
| | | | | DIFF: 2 PROCEDURE REF: | | |
| | | | | TIME: 1 minute or Par Press controlle | er in Remote / Mas | |
| | | | | for the following: | | |
| | | | | 2) C. Cannella | | |
| | | | | 3) M. Baca 4) M. White | | |
| | | | | 5) R. Brown | | |
| | | | | 4) m. White | | |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-9a

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| ltem # Ques # | Points | Question | Answ | erl | Exam # R0:890015 |
|---------------|--------|---|--|--|------------------|
| 002927 1.0020 | 1.1 | A. Which RCS loops have reverse flow? | A. \$4 | (0.5) | |
| | | B. Which RCS loops will develop reverse flow? Assume all automatic actions associated with the turbine trip occurs. | LP REF: | & \$3 (0.5) CY-OP-LOCT-87-5-587 7-EA1.04 | 503 K/A REF: |
| | | | E. OBJ: RATING: DIFF: PROCEDU | ₿6 3.6/3.7 | K/A |

NRC MASTER

WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : LORT SE-9 Examination Category : I

F

Examinee : ____ Examination Number : RO : 880045 Developed : CY /NRC STREE Date Administered : 514167 Approved : fortheoleck

* *

| inal | Grade | : | |
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|--------------------|---|-------------------------------------|----------------------------|---------------|------------------------------------|
| N.T | .D. | Sup | er | vi | sor |

Instructions to the Examinee :

- Talking during the examination is strictly forbidden. 1.
- If a question is not understood, raise your hand so that a 2. proctor/examiner may assist you.
- All required reference materials will be provided by the 3. proctor/examiner.
- 4. Cheating in any form may result in a recommendation for disciplinary action.
- Each examination response sheet shall be numbered by you. You 5. shall write your name or initials on each examination response sheet.
- 6. The passing grade requires a final grade of at least 80%.
- The total duration of this examination shall be 0.75 hours. 7.

All work done on this examination is my own; I have neither given nor received aid.

Student's Signature

ATTACHMENT 1

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WRITTEN EXAMINATION COVER SHEET Nuclear Training Department / Connecticut Yankee Operator Training Operator Training Course Exam : LORT SE-9

Examination Number : RO : 880045 Date Administered : 5/4/89

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| Category Value | % of Total | Student's Score | % of <u>Cat. Value</u> | Category |
|-------------------|---------------|--------------------|---------------------------|-----------------------------------|
| 25.0 | 100.00 | | | MAJOR EVENT- RCP SHAFT SHEAR/ATWS |
| 0.0 | 0.00 | | | |
| 0.0 | 0.00 | | | |
| 0.0 | 0.00 | | | |
| 25.0 | 100.00 | | | Totals |
| | | Final Grade | 8% | |

Page 1 WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT SE-9 / / Ques # / Pts Question Exam # : RO : 880045

1.0001 / 1.2 The primary RO upon receipt of RCS Low Flow at 100% pwr and noticing the RX did not trip pushed the RX trip button. Is the RX in the process of tripping at this time. Explain.

1.0002 / 0.8 List two indications that #4 RCP did not trip ?

1.0003 / 1.4 The RCP Low Flow alarm was due to which of the following events:

- A. Undervoltage
- B. Bkr opening
- C. Rotor Shear
- D. Seized Rotor

1.0004 / 1.1 A. Which RCS loops have reverse flow?

B. Which RCS loops will develop reverse flow? Assume all automatic actions associated with the turbine trip occurs.

1.0005 / 0.8 Why were Pzr. spray valves ineffective in mitigating the RCS. pressure transient prior to the turbine trip?

| proc. | - | 1 | e | - |
|-------|---|-----|------|---|
| 0 | - | 100 | 23 · | |
| | | | | |
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WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT SE-9 / /

| Ques # / | Pts | Question | Exam | # : RO : | 880045 |
|----------|-----|--|---------|-----------|--------|
| 1.0006 / | 1.4 | Using all loop Taves calculate the actual | plant | tavg? | |
| 1.0007 / | 2.0 | Neglecting the effects of control rods , W controlling Reactorpower ? | What is | s present | .1y |
| 1.0008 / | 1.0 | Why is charging flow at a minimum? | | | |

1.0009 / 1.4 Why is PZR level setpoint 50% at this time?

1.0010 / 1.4 Determine the status of the four feed regulating valves and explain any differences.

| Page 3 Nuc | lear Tr | WRITTEN EXAMINATION aining Department / Connecticut Yankee Operator Training Course Exam : LORT SE-9 / / |
|---------------|---------|--|
| Ques # / | Pts | Question Exam # : RO : 880045 |
| 1.0011 / | 1.2 | After verifying >320 gpm AFW flow what effect, if any, would the RO have on S/G level if he shuts the feed line MOVs and leaves them shut. Assume no other changes to plant conditions take place. |
| 1.0012 / | 0.8 | Why are all four feed regulating valve auto control signals on the controllers indicating 0% output? |
| 1.0013 / | 1,1 | Steam line isolation occurred on high stm flow Delta P. Explain how loss of flow in loop 4 led to this condition. |
| 1.0014 / | 2.0 | List 3 different methods that could be laken at this time in the control room to shutdown the Reactor? (Assume both Reactor trip buttons have been pushed.) |

WRITTEN EXAMINATION Nuclear Training Department / Connecticut Yankee Operator Training Course Exam : LORT SE-9

Ques # / Pts Question

Exam # : RO : 880045

1.0015 / 1.3 The SRO based on feedback from his operators has told the SS "I have completed E-O am transiting to ES-0.1." What procedure should he be in at this time.

1.0016 / 1.3 For the following parameters indicate if they would be higher than, lower than or the same if this accident had occurred at EOL conditions.

> a. RX pwr b. Tavg

1.0017 / 1.4 Classify the event. A manual reactor tripped has been attempted. (Assume all efforts have been attempted to trip the RX and were unsuccessful .)

1.0018 / 1.3 List four of the RPS trip signals present up to now that should alone been able to trip the reactor.

1.0019 / 1.0 List two different indications that confirm that the turbine has tripped.

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| Page | 5 | | WRITTEN EXAMINATION | |
|------|---------|----------|---|--|
| | Nuclear | Training | Department / Connecticut Yankee Operator Training Course Exam : LORT SE-9 / / | |

Ques # / Pts Question

Exam # : RO : 880045

1.0020 / 1.1 Why have the RCP labrynith seal d/p indications decreased ?

MRITTEN EXAMINATION ANSWER NEY Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-8

| :en # | QUES # | Points | QUESIION | Answer | N # R0:880045 |
|--------|--------|--------|---|---|---------------|
| 02924 | 1.0001 | 1.2 | The primary RO upon receipt of RCS Low Flow at 100% pwr and noticing the RY did not trib pushed the RY trib putton. Is the RA in the process of tribping at this time. Explain | LP REF. CY-OP-LOCT-47-5-541503 DOC-029-EA2.07 E. OBJ: #7 4.2/4.3 | K A RATING |
| | | | | DIFF: 2 REF: TIME:1 minute | PROCEDUPE |
| 02925 | 1.0002 | D.8 | List two indications that #4 RCP old not trip 3 | BKR. ind. (Red light) (.5) Pum | p amps . (.5) |
| | | | | LP REF: CY-OP-LOCT-87-3-\$87305 | K/A REF: |
| | | | | 003-000-A3.02 E. OBJ: #5 | K/A RATING: |
| | | | | 2.6/2.5 DIFF: 2 REF: TIME:1 minute | PROCEDURE |
| 002926 | 1.0003 | 1.4 | The RCP Low Flow alarm was que to which of the following events: | | |
| | | | A. Undervoltage | LP REF: C 2+LOCT-87-3-587305 000-015-64 .1 | K/A REF: |
| | | | B. Bkr opening C. Rotor Shear | E. OBJ: #5 3.0/3.5 | K A RATING |
| | | | D. Seized Rotor | DIFF:3 | PROCEDURE |

REF: TIME:1 minute

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-9

| tem # | Ques # | Points | Question | Answer Sza | <u>n : Rolásio48</u> |
|--------|--------|--------|---|---|--|
| 02927 | 1.0004 | 1,1 | A. Which RCS loops have reverse * Dw? | 4. #4 0.8 | |
| | | | B. Which RCS loops will develop reverse flow? Assume all automatic actions associated with | | |
| | | | the turbine trip occurs. | UP REF CH-OP-LOCT-81-5-581803 | < A REF. |
| | | | | E. OBJ: #6 RATING: 3.6.3.7 DIFF: 2 PROCEDURE REF: TIME:1 minute | A.A |
| 302928 | 1.0005 | 0.8 | why were Pzr. spray valves ineffective in mitigating the RCS, pressure transient prior to the turbine trip? | Short cyaing iND flow in loop from lood #2 back through loop OF REF: -OP-LOCT-87-5-58750 000-029-5: 01 Cor the E. OBJ: #7 RATING: 2.8 3.1 DIFF: 2 PROCEDURE ## | K/A REF: k/A REF: k/A k/A k/A k/A k/A k/A k/A k/A |
| 002929 | 1.0006 | 1,4 | Using all loop Taves calculate the actual plant tavg? | LOOD #1 + LOOD #2 + loop #3 + devided by four. Value to be day of examining for 5 Deg F. 6 degrees F (.5) | Loop #4 Tave. determined on the |
| | | | | | |
| | 3 | 5 85 | + 586 + 584 + 533 | LP REF: C:-OP-LOCT-87-5-58750 000-017-E41.09 | 3 K/A REF: |

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WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department Conflictious fankee Operator Training LOP 12-9

| item # | Ques # | Points | Question | Answer | Exam # R0:380045 |
|--------|--------|--------|--|----------------|--|
| 002930 | 1.0007 | 2.0 | Neglecting the effects of control roos , what presently controlling Reactorcower ? | pwr. 0.5 each) | safeties are controlling RX Concepts applied FTU, JOIDS |
| | | | | | CT-87-5-S87503 K/A REF: K/A RATING: PROCEDURE |
| 02931 | 1.0008 | 1.0 | why is charging flow at a minimum? | PER IEURI | ng programmed value. (1.0) or in Remote monumation ct-87-5-587503 K/A REF: 1. R. Recenes. K/A 2. M. White. 3. R. Remun 4. M. Bara 5. C. Cannella 6. T. D. La |
| 002932 | 1.0009 | 1.4 | Why is PZR level setooint 50% at this time? | concepts a | 6. 5 Banks. appled to 11.01 applied CT-87-3-587302 K/A REF: K/A RATING: PROCEDURE |

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WRITTEN EXAMINATION ANSWER KEY

Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-9

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age 4

| tem # | Ques # | Points | Question | Answer | Exam # R0:880045 |
|-------|--------|--------|---|---|---|
| 02933 | 1.0010 | 1.4 | TOITED BIN DAPING | <pre>#1, 2 & #3 are wide open shut (.25) because of hig (.5)</pre> | (.25) #4 is shut. #4 is in level override at 69% |
| | | | | LP REF: CY-OP-LOCT-87-5- 059-000-A4.08 E. OBJ: #6 RATING: 3.0/2.9 DIFF: 3 PROCEDURE REF: TIME:1 minute | -58~503 K/A REF: K/A |
| | | | | • | |
| 029.4 | 1.0011 | 1.2 | After verifying 320 gpm AFW flow what effect, if any, would the RO have on S/G level if ne shuts the feed line MOVs and leaves them shut. Assume no other changes to plant conditions take place. | out of the SiGs (1.0) | |
| 02935 | 1.0012 | 0.8 | Why are all four feed regulating valve auto control signals on the controllers indicating O output? | The output signal is con % setpoint, and this is bi level, #1.1 & 3 SF is b thus all four output si (Concept applied) | ased upon SF/FF & S/G |
| | | | | LP REF: C'-OP-LOCT-87- D59-000-K4 18 E. OBJ: #6 2.8/3.0 | 5-S87503 K/A REF: K/A RATING PROCEDURE |

TIME:3 minutes

WRITTEN EXAMINATION ANSWER KEY Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-9

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| tem # | Ques # | Points | Question | Answer | Exam # R0:880045 | |
|--------|--------|--------|---|---|-----------------------------------|--|
| 302936 | 1.0013 | 1.1 | Steam line isolation occurred on high stm flow Delta P. Explain now loss of flow in loop 4 led to this condition. | As flow in loop 4 decreased temp in that loop decreased stm flow went down, the other 3 S/Gs picked up the stm flow thus tripping the WLS. (Concept applied) | | |
| | | | | LP REF: CY-OP-LOCT-88-4- 003-000-K3.02 E. OBJ: #2 3.5/3.8 DIFF: 2 TIME:2 minutes | L00403 K/A RATING: K/A RATING: | |
| 002937 | 1.0014 | 2.0 | List 3 different methods that could be taken at this time in the control room to shutdown the Reactor? (Assume both Reactor trip buttons have been pushed.) | Drive Rods Emergency bor 4971 Bkrs The turbing. (LP REF: CHOP-LOCT-B7-5- 000-029-E: 12 E. OBJ: = 4.4/4.7 DIFF: 3 REF: TIME:1 minute | (.33 each-3 reod) | |
| 002938 | 1.0015 | 1.3 | The SRO based on feedback from his operators had told the SS 'I have completed E-O am transiting to ES-0.1." What procedure should ne be in at this time. | s Shoulo be FR-S.1. (1. LP REF: C:-DP-LOCT-88-1 000-029-EK:12 E. OBJ: \$9 4.4/4.7 DIFF: 2 REF: TIME:1 minute | | |

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WRITTEN EXAMINATION ANSWER KEY

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Nuclear Training Department / Connecticut Yankee Operator Training LORT SE-9

| ten # | Ques 1 | Points | Question | Answer | Exam # R0:880045 |
|--------|--------|--------|--|---|---|
| 02939 | 1.0016 | 1.3 | For the following parameters indicate if they would be higher than, lower than or the same if this accident had occurred at EOL conditions. | a. Lower. (.50) b. Lower. (.50) | |
| | | | a. RX pwr b. Tavg | LP REF: CY-OP-LOCT-88-4- 000-029-EK1.01 E. OBJ: #16 2.8/3.1 DIFF: 3 REF: TIWE: 1 minute | L88402 K/A REF: K/A RATING: PROCEDURE |
| 103449 | 1.0017 | 1.4 | Classify the event. A manual reactor tripped has been attempted. (Assume all efforts have been attempted to tri; | LP REF:EP10 K/A REF:C | |
| | | | the RX and were unsuccessful .) | RATING:3. 4.3 ED: 7 DIFF: 3 TIME: 1 MJ | PROC REF: EPIP 1-5.1 |
| 003450 | 1.0018 | 1.3 | the RX and were unsuccessful .) List four of the RPS trip signals present up to now that should alone been able to trip the reactor. | RCP BER C RCP BER C RX TE ip Public | PROC REF: EPIP 1-5.1 INUTES |

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| Item 🤇 | Ques # | Points | Question | Answer | Exam # R0:880045 |
|--------|--------|--------|---|---|-----------------------------------|
| 003451 | 1.0019 | 1.0 | List two different indications that confirm that the turbine has tripped. | Stop valves shut Gov valves shut Low auto stop oil pre (.5 each) | essure |
| / | | | | LP REF:87-5-587502 RATING: 3.4/3.6 | K/A REF:045000A3.04 K/A |
| ~ | | | | ED:3 DIFF: 2 TIME: 1 | PROC REF:E-0 MINUTES |
| | | | | | |
| 03452 | 1.0020 | 1.1 | Why have the RCP labrynith seal d/p indications decreased ? | RCS pressure has inc that of seal supply) | reased. (to greater than (1.0) |
| | | | | LP REF:81-1-106 K/ RATING: 3.4 3.8 | A REF: 004000A1.03 K/A |
| | | | | ED. TLO DIFF:2 TIME: 2 MI | |