ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-361/95-19
50-362/95-19

Licenses: NPF-10
NPF-15

Licensee: Southern California Edison Co.
P.O. Box 128
San Clemente, California

Facility Name: San Onofre Nuclear Generating Station, Units 2 and 3

Inspection At: San Clemente, California

Inspection Conducted: November 27 through December 1, 1995

Inspectors: M. E. Murphy, Operator Licensing Examiner, Operations Branch
Division of Reactor Safety

S. L. McCrory, Operator Licensing Examiner, Operations Branch
Division of Reactor Safety

Accompanying
Personnel: A. Lopez, Jr., Operator Licensing Examiner
Battelle Pacific Northwest Labs

Approved: /s/ M E Murphy 4 Jan 96
for J. F. Tapia, Acting Chief, Operations Branch Date
Division of Reactor Safety

Inspection Summary

Areas Inspected (Units 2 and 3): Routine, announced inspection of the licensed operator requalification program and the qualifications of applicants for senior operator licenses at the San Onofre Nuclear Generating Station. This included an eligibility determination and administration of comprehensive written examinations and operating tests. The examiners also observed the performance of on-shift operators and plant conditions incident to the conduct of the applicant evaluations. The facility volunteered to participate in a pilot initial examination process, which involved facility development of the initial examinations, facility administration of the written examination, and, NRC administration of the operating examinations. Guidance for the

development and administration of the pilot examinations was contained in Generic Letter 95-06 and Attachment 1 to Regional Office Interaction Memorandum 9525, which was used in addition to the guidance provided in NUREG-1021, "Operator Licensing Examiner Standards," Revision 7, Supplement 1, Sections 201-203, 301-303, 401-403.

Results (Units 2 and 3):

Operations

- The three applicants for senior reactor operator licenses satisfied the requirements of 10 CFR 55.33(a)(2) (Section 1) and their licenses were issued.

- The written examination originally prepared by the licensee did not meet the expected level of difficulty for an initial examination and required significant modification prior to administration. The final examination did provide an evaluation tool that was adequate to support licensing determinations (Section 1.1).

- The facility developed operating examinations required several changes prior to administration (Section 1.2).

- The team observed generally good command and control, communications, safety awareness and systems knowledge during administration of the initial examinations (Section 1.2).

- The requalification program examination material was acceptable but there were weaknesses identified in the job performance measures and the written question construction (Section 2.1).

- There was an example of a lack of attention to detail in the post-development review and validation of requalification examination material (Section 2.2).

- Requalification examination scenario quality and administration were good and licensee's evaluations were detailed. Lack of objective guidance for assessing performance against newly developed rating factors was considered a weakness (Section 2.3).

- The feedback system was effective in development of improvements in the training program (Section 2.6).

- The licensee continued to be challenged in their efforts to improve communication skills (Section 2.6).

Plant Support

- The inspectors observed good general housekeeping and plant material condition (Section 1.2.2).

Summary of Inspection Findings:

- There were no findings identified during the course of this inspection.

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Simulation Facility Report
- Attachment 3 - Written Examination and Answer Key

DETAILS

1 LICENSED OPERATOR APPLICANT INITIAL QUALIFICATION EVALUATION (NUREG-1021)

This inspection consisted of an evaluation of applicants for senior reactor operator licenses. The licensee volunteered to participate in a national pilot study for these examinations. The pilot study involved facility development of all initial examination material, facility administration of the written examination (not including the generic fundamentals examination,) and NRC administration of the operating examination. NRC coordinated with the facility using the pilot examination guidance contained in Regional Office Interaction Memorandum 9525, Attachment 1, and Generic Letter 95-06, and granted final approval of all initial examinations to be administered at the facility.

During the inspection, the examiners evaluated the qualifications of three applicants for senior reactor operator licenses. The inspection assessed the eligibility and administrative and technical competency of the applicants to be issued licenses to direct the operation of the reactivity controls at the San Onofre Units 2 and 3 commercial nuclear power facility in accordance with 10 CFR Part 55 and NUREG-1021, "Operator License Examiner Standards," Revision 7, Supplement 1, Sections 200 (series), 300 (series), and 400 (series). Further, the inspection included evaluations of facility procedures and simulation capability used to support administration of the examinations. These areas were evaluated using the guidance provided in the areas of NUREG-1021 cited above. Finally, the examiners observed the performance of onshift operators and plant conditions during the conduct of inplant applicant evaluations.

After completion of the evaluations, the examiners determined that the three applicants for senior reactor operator licenses satisfied the requirements of 10 CFR 55.33(a)(2) and their licenses were issued.

1.1 Written Examination

The facility developed and submitted the written examination to the chief examiner for review on November 6, 1995. The chief examiner was onsite the week of November 13 for comment review and disposition. The chief examiner found that the licensee's written examination did not meet the expected level of difficulty for an initial examination. This required significant rework by the licensee, including the replacement of several questions and the rewriting of numerous question stems and distractors. A lack of attention to detail during the review process was evidenced by the numerous editorial errors and by the failure of the licensee to incorporate all of the dispositioned corrections into the examination prior to its submittal as a final product.

The chief examiner confirmed the incorporation of the revisions into the final written examination on November 27, 1995. The chief examiner found the revised written examination tested at the proper level of knowledge, was valid for a licensing decision and met the requirements of NUREG 1021, Revision 7, Supplement 1.

The facility administered and graded the written examination on November 29, 1995. The chief examiner also graded the written examination, and reviewed the facility analysis of the examination results as required in the pilot guidance. The facility did not request any post-administration revisions to the examinations, however, the facility determined that an erroneous assumption had been made during the development of question 42 and the answer key was changed to reflect the correct answer. The chief examiner concurred with the facility grading and analysis.

All applicants passed the written examination and the average score was 90 percent. Four questions (Nos. 29, 38, 54, and 70) were missed by all three candidates and three questions (Nos. 43, 72, and 91) were missed by two of the three candidates. These questions were evaluated by the facility to be valid questions and the examiners concurred with this evaluation.

No generic training weaknesses were identified as a result of the written examination results.

1.2 Operating Examinations

The facility developed operating tests in accordance with the pilot guidance and guidelines of NUREG-1021, Revision 7, Supplement 1, Section 301. The operating tests consisted of three parts: an administrative portion, a control room/plant walkthrough portion, and a dynamic simulator scenario portion. The examiners reviewed the various portions of the operating tests both in office and at the San Onofre facility and dynamic simulator during the week of November 13, 1995. As discussed below, the operating examinations required several changes based on the examiners' review. The licensee's personnel, under security agreement, assisted in the on-site validation. The examination team administered the operating tests during the week of November 27, 1995.

1.2.1 Administrative Section

The material for the administrative portion (Part A) of the operating examination was inadequate as submitted. Several of the evaluation topics discriminated poorly and lacked specific performance criteria. For example, "To evaluate Key Control and Safety," Section A.1 of the Part A outline, required, "Check out keys for JPMs" and "Adhere to noise protection requirements." Apart from having very low discrimination, no performance criteria were provided for these tasks. Some tasks were applied incorrectly to the various portions of Part A, for example, in Section A.3, "Radiation

Control," the applicant was given the task of determining protective action recommendations following an emergency action level classification. The intent of Section A.3 was to evaluate radiation protection controls as a part of routine operations rather than emergency plan implementation requirements.

The chief examiner discussed several specific comments regarding the administrative section with the licensee. The licensee acknowledged the concerns with the material and completely revised the section. The chief examiner reminded the licensee that the pilot program guidance advised the use of NUREG-1021, Revision 7, Supplement 1, Section 301, for the development of the operating tests. The revised section was found acceptable and was administered during the week of November 27, 1995. The three candidates performed satisfactorily in this area.

1.2.2 Walkthrough Examinations

The operator task portion (Part B) of the submitted examination contained two job performance measures that had low discrimination or poor validity. One of the job performance measures required the examiner to evaluate an applicant verifying system alignment following a recirculation actuation signal. The task did not require the applicant to perform any actions other than verifying instrument readings and indications. Some of the system followup questions did not evaluate system knowledge, but rather, procedural or administrative requirements. Most of the question answer keys failed to objectively identify the minimum required response for a passing score on the question. The chief examiner reviewed these observations with the licensee. The licensee replaced the two job performance measures of concern and revised the followup questions. The revised material was found acceptable and administered during the week of November 27, 1995.

The examination team evaluated each of the candidates using the system oriented job performance measures related to job tasks within the scope of their potential duties, as appropriate, in accordance with NUREG-1021, Revision 7, Supplement 1. This included nonlicensed operator tasks outside the control room and performance of some tasks in the simulator in the dynamic mode. Each of the applicants was required to enter the radiologically controlled area to complete one or more tasks. In addition to tasks, the examiners asked pre-scripted questions related to the task system. Facility administrative procedures and practices were also examined using job performance measures or questions.

The examiners noted good procedure usage and system knowledge during the walkthroughs. The examiners also observed good plant housekeeping and material condition and plant ownership from the candidates. All three candidates performed satisfactorily during the walkthroughs.

1.2.3 Dynamic Simulator Scenarios

The simulator scenario set was adequate as submitted, however, the examiners identified some deficiencies that were additional examples of a lack of attention to detail during the review process and an example of poor validation. One of the events did not have expected operator actions identified. Another event (loss of 4160 volt vital bus), while being credited as a reactor operator component malfunction in the outline, did not identify any reactor operator actions on the event page. As a result, the applicant performing as the reactor operator for that scenario would have been marginally evaluated in component failure response. Based on examiner comments, the licensee attempted to identify reactor operator actions in response to the loss of the 4160 volt bus. However, during actual conduct of the scenario, the secondary operator performed all the required actions, necessitating the addition of a component malfunction that sufficiently challenged the reactor operator. Some events required little operator response, such as observing that a pump did not start in automatic and manually starting it.

The concerns with the examination material were reviewed with the licensee. The licensee acknowledged the comments and revised the scenarios, however, during subsequent review prior to administering the examinations, the examiners determined that the licensee had not included the missing expected operator actions. This was another example of a lack of attention to detail during the material review process.

The examiners evaluated the three candidates on three scenarios using the San Onofre plant-specific simulation facility. The examiners evaluated the applicants' competencies by comparing actual performance during the scenarios against expected performance in accordance with the requirements in NUREG-1021, Revision 7, Supplement 1, Section 303.

The team observed generally good command and control, communication, safety awareness and system knowledge. The three candidates performed satisfactorily during the scenarios.

1.3 Simulator Fidelity

During the preparation and conduct of the operating examinations, the simulator performed well and exhibited no performance or modeling deficiencies, as described in Attachment 2.

2 LICENSED OPERATOR REQUALIFICATION PROGRAM EVALUATION (IP 71001)

During the inspection, the licensee's requalification program was assessed to determine whether the program incorporated appropriate requirements for both evaluating operators' mastery of training objectives and revising the program in accordance with 10 CFR Part 55. The licensed operator requalification program assessment included a review of training material for the past year, evaluation of the program's controls to assure a systems approach to training,

and evaluation of operating crew performance during annual requalification examinations. This included review of the facility documents, observation of operating and staff crews during dynamic simulator scenarios and plant walkthroughs, and an assessment of the licensee evaluators' effectiveness in conducting examinations.

2.1 Examination Preparation

This portion of the inspection was conducted to determine the effectiveness of the methodology used to develop and construct the requalification examinations and to assess the effectiveness of the examinations to identify retraining needs and measure the examinee's subject knowledge. The examination sampling plan was also reviewed, and training personnel interviewed to ascertain the methods used in developing the examination. The inspectors also determined the validity of the examinations to provide a basis for evaluating the examinee's knowledge of abnormal and emergency operating procedures.

The inspectors reviewed written examinations administered during the week of the inspection and those administered in the weeks prior to the inspection. While the examinations were adequate overall, the individual questions exhibited several flaws or deficiencies. Most of the flaws related to distractors with low credibility or internal cues which increased the examinees' chances of guessing the correct answer. Some questions also had low discriminatory value. The inspectors concluded that the quality of the questions used in the requalification examinations were comparable to those provided in the pilot initial examination submittal.

Six simulator scenarios administered during this requalification cycle were reviewed. The scenarios evaluated competencies and contained quantitative attributes similar to those specified in NUREG-1021, Supplement 1, Revision 7. The scenarios were challenging and provided realistic situations. There was an emphasis on major events based on the licensees program to drive the crews into the functional recovery procedures. The licensee had an examination bank of 49 scenarios, and repeated up to 20 percent of the scenarios during the course of a requalification cycle. The licensee had a program for periodic review and revision based on both comments from the test administrators and other sources of feedback.

The examiners reviewed 15 job performance measures that were administered during this requalification cycle. The job performance measures met licensee program requirements similar to the guidance of NUREG-1021 and contained performance standards that were clear, objective, and relevant. There were, however, several job performance measures used for in-plant walkthroughs that lacked cues for actions taken. A job performance measure, newly developed for this evaluation cycle, did not require any control or component manipulation by the operator but only required verification of plant conditions (a similar task had been included in the original submission for the initial licensing examination). The inspectors pointed out the difficulty of assuring a valid measurement of operator competency with such a task. As noted later in this report, operators exhibited inconsistent test-taking skills and behaviors

which would have impacted an objective measurement of a validation only task. The licensee acknowledged these job performance measure deficiencies and agreed to make appropriate revisions to the job performance measures in question. The licensee had established and maintained an excellent data tracking system to track the use of job performance measures during the annual requalification training cycle.

A review of the training sample plan determined that the licensee adequately covered the topics identified in 10 CFR 55.41 and 10 CFR 55.43. The sample plan was well laid out and used extensively as indicated by comparing the plans used for three crews during this training cycle. There was no overlap of questions and only one scenario was repeated once in a three week period of the requalification evaluation cycle. The review confirmed that the licensee's sample plan followed the standards for overlap allowed with previously administered examinations as established by Administrative Procedure SO123-XXI-8.4, "Licensed Operator Requalification Examinations.

2.2 Written Examinations

The inspectors observed the licensee administer the static simulator examination and the classroom written examination to three crews concurrently. The crews were kept in controlled security areas and the examinations were adequately proctored. The overall examination security was good. The inspectors determined that the licensee's written examination process was conducted in accordance with guidelines similar to those of NUREG-1021. As a result of inspector identified deficiencies in some questions to be administered as part of the written examination during the week of the inspection, the licensee revised a number of questions. An examination intended to reflect those revisions was then generated from the electronic question bank and administered to licensed operators on November 30, 1995. However, during the administration of the examination, the licensee determined that the wrong examination was actually administered. This error was the result of a failure to conduct a post revision review of the examination. This was another example of a lack of attention to detail in the review process. The licensee subsequently determined that the administered examination complied with the sample plan and could be accepted as valid for the crews examined on November 30, 1995.

2.3 Dynamic Simulator Examinations

The inspectors observed one operating crew and one staff crew on two scenarios each, over a 2-day period, using the plant-specific simulation facility. The inspectors observed the licensee's training department evaluators in their function of assessing the crews' competency. The examination process was well organized and properly administered. No discrepancies were noted in the identification and documentation of individual or crew performance. Weaknesses observed by the inspectors were generally consistent with those identified by the facility.

The licensee had recently initiated a new four factor rating scale for the evaluators use in determining individual and crew performance. However, no behavioral criteria had been developed for the rating factors nor had specific guidance been provided on how to arrive at a rating factor for a specific competency. As a result, the evaluators expended considerable time discussing the specific rating value (such as 2.3 versus 2.8) to assign to a competency area. Further, the lack of objective guidance in the controlling procedure made the resulting evaluation highly subjective. The inspectors concluded that this was a weakness in the licensees evaluation program.

During the observation of one scenario, the inspectors noted a problem when the evaluators impacted the scenario as a result of an unplanned simulator malfunction. The qualified safety parameter display system unit failed due to a simulator malfunction. The examinees found the problem while responding to a pressurizer pressure transmitter failure. The evaluators were made aware of the failure by the simulator maintenance crew and by the examinee response to the qualified safety parameter display system. The evaluators proceeded to remedy the situation by going to the qualified safety parameter display system panel and trying to operate it. This resulted in the operating crew (examinees) being made aware that the qualified safety parameter display system failure was an unplanned event. The control room supervisor told the crew that the qualified safety parameter display system failure was not part of the scenario (evaluator interference cued him to this).

The inspectors pointed out that examinees need to respond to events (failures) without evaluator interference and that problems should be fixed prior to beginning a scenario so that examinees do not have to deal with simulator problems that are not part of the scenario. Training department supervision agreed that this was not the expected response by evaluators, and that this concern would be reviewed with training personnel to insure evaluator conduct will meet expectations in the future.

2.4 Walkthrough Examinations

The inspectors observed the licensee evaluators and the requalification examinees during conduct of system-oriented job performance measures related to job tasks within the scope of their potential duties. This included nonlicensed equipment operator tasks outside the control room and the performance of some tasks in the simulator in the dynamic mode.

Licensee evaluators generally performed well during the examinations. The inspectors noted that some evaluators did not adequately shield their notes from the examinees. The examinees could view the notes that the evaluator was making during the examination. This was discussed with the licensee and they acknowledged that this required corrective action.

2.5 Remediation

Results of interviews and records review disclosed that the remediation program was effective and was being conducted in accordance with guidance the facility had established for the program in Procedure S0123-XXI-8.4, "Licensed Operator Requalification Examinations," Section 6.8.

2.6 Feedback System

The inspectors reviewed the licensee's process for obtaining and incorporating employee feedback, local and industry events, and training evaluations into the requalification program. The inspectors determined that multiple methods of feedback to the training program existed and these systems appeared to be effective in adjusting the program to meet the needs of the licensed operators.

The inspectors reviewed licensee and NRC documents to determine if operator performance indicators existed that raised concern regarding the effectiveness of operator training. The inspectors did not find information that indicated that training had contributed to operator errors or failed to adequately address identified deficiencies. However, the inspectors provided the licensee with a summary of operator errors documented over the assessment period and requested the licensee to show how the licensed operator training program had been revised or upgraded as a result. Additionally, the inspectors reviewed the licensee's operator performance tracking information to understand how that information was also being used to improve the licensed operator training program.

The licensee responded by describing several initiatives that were planned or had begun in regard to operator performance problems. The principal areas identified by the licensee that resulted in training program changes were:

- Communications,
- Chain of command during outages,
- Outage requirements,
- Procedure compliance, and
- Control board awareness.

To address these performance areas, the training department developed lesson plans for periodic classroom review of outage issues and procedure compliance, and increased emphasis during simulator training on communications and control board awareness.

The licensee has been challenged during the assessment period in their effort to improve crew communications. In addition to increased emphasis on communications during training, the operations department recently assigned new supervisory operators to several crews and placed operations managers in the control room for extended periods to reinforce communications

requirements and expectations. The inspectors observed mixed performance in this area among the crews evaluated in the simulator during the initial and requalification examinations. However, compared to documented past performance, the inspectors concluded that operator performance had improved in this area.

Other positive training initiatives included:

- Greater integration of the plant equipment operators into simulator training,
- Creation of a "Venting Skid" to improve procedure writers' understanding of the need to walk down procedure venting line-ups in the plant rather than relying solely on system drawings and descriptions, and
- Customizing simulator training for individual crews.

The inspectors concluded that the licensee's training initiatives to address performance problems were appropriate, however, since many of the activities were begun relatively recently or were still in development, their effectiveness could not be assessed during this inspection.

2.7 Licensed Operator License Conformance

The licensee maintained a list of all licensed individuals, indicating active or inactive status, as well as medical restrictions. The list also indicated senior reactor operator licenses which were active for fuel handling or reactor operator duties only. A current copy of the list was kept in the shift superintendent's office. Proficiency watch standing and under-instruction watch standing for reactivation were tracked by the nuclear operations assistants. The inspectors reviewed the files for all individuals whose licenses had been reactivated in 1995 and found no discrepancies. Similarly, an inspector interviewed the onshift shift superintendent to assess his understanding of assuring that only fully qualified operators were allowed to take the shift. The shift superintendent demonstrated good familiarity with the tracking system and procedural requirements for shift manning.

The licensee maintained a data base to track the status of medical certifications. This data was printed monthly to schedule upcoming medical examinations for individuals who were within 60 days of the expiration date of their medical certification. The inspectors reviewed eleven licensed operator medical records, which were shown as having expired prior to the November report or before the December report was to be run, to assess compliance with specific requirements. All medical records reviewed were complete and current. The inspector noted that the tracking system report that was run monthly often lagged by as much as six to eight weeks in being updated following the completion of a medical certification.

The inspectors concluded that the licensee's program met the requirements of 10 CFR 55.53(e)(f)(i).

2.8 Simulator Fidelity

Operations and training personnel interviewed during the inspection expressed satisfaction with simulator performance and stated that simulator capabilities had supported performance of desired training. The inspectors observed no simulator fidelity problems during the examinations.

ATTACHMENT 1

PERSONS CONTACTED AND EXIT MEETING

1 PERSONS CONTACTED

1.1 Licensee Personnel

L. Boerneke, Reactor Operator
*J. Darling, Compliance Engineer
*A. Hagemeyer, Nuclear Training
M. Jones, Assistant Plant Superintendent
*M. Kirby, Supervisor, Nuclear Training
*J. Lambla, Engineer
M. Lisitza, Senior Reactor Operator
*W. Lyke, Nuclear Training
M. Mauntel, RN, Supervisor
D. Miller, Nuclear Instructor
*G. Mueller, Engineer, Quality Assurance
*G. Plumlee, III, Supervisor, Regulatory Compliance
*K. Rauch, Supervisor, Operations Training
W. Reeves, Senior Reactor Operator
*R. Sandstrom, Manager, Nuclear Training
J. Wurtz, Nuclear Instructor

1.2 NRC Personnel

*J. Sloan, Senior Resident Inspector

In addition to the personnel listed above, the inspectors contacted other personnel during this inspection period.

*Denotes personnel that attended the exit meeting.

2 EXIT MEETING

An exit meeting was conducted on December 1, 1995. During this meeting, the inspectors reviewed the scope and findings of the inspection. The licensee acknowledged the inspection findings as they were presented. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.

ATTACHMENT 2

SIMULATION FACILITY REPORT

Inspection Report: 50-361/95-19; 50-362/95-19

Facility Licensee: Southern California Edison Co.

Facility Name: San Onofre Nuclear Generating Station

Facility Docket: 50-361; 50-362

Initial Examination Operating Tests Administered: November 27, 1995

Requalification Operating Tests Administered: November 28-29, 1995

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of noncompliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information that may be used in future evaluations. No licensee action is required in response to these observations.

RESULTS:

No simulator fidelity problems were observed during the examinations.

ATTACHMENT 3

WRITTEN EXAMINATION AND ANSWER KEY

Start Time: _____ Name: _____

End Time: _____ Soc. Sec. #: _____

Date Administered: 11/29/95
Prepared by: Donald Millef
Approved by: _____

Training Program:	License Candidate
Exam Period:	NRC Final
Training Group:	395-1
Examination #:	2845
Encode Number:	NRCLIC

Instruction:

Print your name and soc: SONGS AS ADMINISTERED WRITTEN EXAM & ANSWER KEY in the indicated spaces above. The passing grade fo: s 80%. Review the "POLICIES and GUIDELINES fo next page, with the proctor, before beginning t atement at the bottom of this page and, **WHEN YOU XAMINATION**, affirm the statement by signing your n

Category		Percent
1. Initial SRO NRC Final	PLEASE RETURN TO L. HURLEY	_____

Graded By: _____ _/___

Checked By: _____ Date: ___/___/___

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

_____
Applicant's Signature

Policies and Guidelines for Taking NRC Written Examinations

1. Cheating on the examination will result in a denial of your application and could result in more severe penalties.
2. After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination.
3. To pass the examination you must acheive a grade of 80% or greater.
4. The point value for each question is one (1) unless indicated differently.
5. There is a time limit of four (4) hours to complete this examination.
6. Use only black ink or dark pencil to ensure legible copies.
7. Print your name and social security number on the examination cover sheet and on the examination answer sheets.
8. Mark your answers on the answer sheets provided and do not leave any questions blank.
9. If the intent of a question is unclear, ask questions of the examiner only.
10. Restroom trips are permitted, but only one (1) applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.
11. When you complete the examination, assemble a package including the examination questions, examination aids, and answer sheets and give it to the examiner or proctor. Remember to sign the statement on the examination cover sheet.
12. After you have turned in your examination package, leave the examination area as defined by the examiner.

SRO License Candidate NRC Final

Question: 1 Point Value: 1.00 LP#: Item #:8207

Chemistry samples indicate specific activity of the primary coolant greater than 1.0 microcurie/gram DOSE EQUIVALENT I-131 for greater than 48 hours. Technical Specification 3.4.7 required you to be in at least HOT STANDBY with RCS average temperature less than 500 deg F within 6 hours.

Which one of the following is the bases for this action?

A. Prevents release of activity into the Chemical Volume and Control System.

B. Prevents release of activity into containment.

C. Prevents atmospheric release of activity in the event of a Steam Generator Tube Rupture.

D. Prevents atmospheric release of activity in the event of a Loss of Coolant Accident with a Loss of Offsite Power.

Question: 2 Point Value: 1.00 LP#: Item #:8344

Which one of the folowing individuals should be required to have an unscheduled shift alcohol screen or Station Manager's approval prior to access to the protected area at SONGS 2/3 per the "Fitness for Duty" policy"?

A. An employee that consumed two cans of beer at a picnic at 10 AM prior to reporting to work at 4 PM.

B. An employee that shared a bottle of wine with his wife at a 7 PM dinner party prior to being called in for overtime as an extra RO at 11 PM.

C. An employee called in for emergency maintenance at 11 PM that notified security that he had been to happy hour at his hotel until 5 PM and his blood alcohol content is 0.02%.

D. An employee who is called in on overtime at 4 PM reports that he has taken a prescribed codeine based cough syrup at noon.

Question: 3 Point Value: 1.00 LP#: Item #:8345

Given the following:

- Plant is at 100% power
- There is a suspected RCS leak inside containment
- The Shift Superintendent and Health Physics Supervisor have authorized entry into Containment to walkdown systems looking for leaks

Which one of the following is required prior to entry into containment?

A. Health Physics Manager be present at the tailboard.

B. Health Physics Manager approval for areas greater than 10 rem/hr.

C. Alternate exit from containment provided and verifed by health physics.

D. A person should be stationed inside the containment to assist.

Question: 4 Point Value: 1.00 LP#:2A0711 Item #:7359

How is an emergency boration flowpath assured on a loss of the Train "B" 1E-480 V bus B06?

A. One Charging pump and both Boric Acid Makeup pumps are powered off the Train "A" 1E-480 V bus B04.

B. One Charging pump, one Boric Acid Makeup pump, and one Gravity Feed valve are powered off the Train "A" 1E-480 V bus B04.

C. Two Charging pumps, one Boric Acid Makeup pump, and one Gravity Feed valve are powered off the Train "A" 1E-480 V bus B04.

D. One Charging pump and both Gravity Feed valves are powered off the Train "A" 1E-480 V bus B04.

Question: 5 Point Value: 1.00 LP#:2AO702 Item #:8195

Given the following:

- Units 2/3 Control Room has been evacuated
- All Communications from the control room have been lost.

Which one of the following would be used to inform crew personnel?

A. Phone

B. Operator's Beeper

C. Page System

D. UHF Radio System

Question: 6 Point Value: 1.00 LP#:2AO702 Item #:8196

The control room has been evacuated due to a fire.

Which one of the following would the Shift Superintendent coordinate with to assess potential damage locally due to the fire?

A. Fire Captain

B. Common CO

C. Emergency Services Officer

D. SRO Operations Supervisor

Question: 7 Point Value: 1.00 LP#:2AO702 Item #:8182

Which one of the following is the preferred way to secure the reactor coolant pumps per SO23-13-2 "Shutdown from Outside Control Room?"

A. Open the 6.9 KV bus feeder breakers.

B. Stop the RCPs from the Second Point of Control.

C. Locally open the RCP 6.9 KV breakers at switchgear 2AO1 and 2AO2.

D. Stop the RCPs from the remote shutdown panel.

Question: 8 Point Value: 1.00 LP#:2AO705 Item #:7354

Which one of the following areas will the Instrument Air System AUTOMATICALLY isolate if a large air leak develops in that area?

A. Containment

B. Fuel Handling Building

C. Radwaste Building

D. Penetration Area

Question: 9 Point Value: 1.00 LP#:2AO705 Item #:8267

Instrument air pressure is 58 psi and slowly lowering. In accordance with SO23-13-5, Loss of Instrument Air AOI, which one of the following is the first action to be performed?

A. Cross tie the Instrument Air System and Service Air Systems.

B. Manually trip the reactor and carryout the SPTA's.

C. Reduced power level to 50%

D. Commence a Shutdown to Hot Standby

Question: 10 Point Value: 1.00 LP#:2AO707 Item #:7319

According to SO23-13-7, "Loss Of Component Cooling Water (CCW)/ Saltwater Cooling (SWC)", which one of the following conditions would require an IMMEDIATE reactor and turbine trip?

A. Loss of CCW to the CEAs.

B. One (1) stage of a Reactor Coolant Pump (RCP) seal has failed on three (3) RCPs.

C. An RCP thrust bearing temperature greater than 225 degs F.

D. Two (2) stages of a RCP seal have failed on one (1) RCP.

Question: 11 Point Value: 1.00 LP#:2AO707 Item #:5859

The non-critical loop of CCW is being restored to service per attachment 1 of S023-13-7, "Loss of CCW/SWC." A note placed before a series of system alignment steps states: "The Letdown Heat Exchanger should be aligned to the Critical Loop that is supplying the Noncritical Loop."

Which one of the following is the basis for this note?

A. This arrangement ensures a normal operating lineup which is assumed in the remainder of the procedures.

B. This arrangement ensures equalization of flows to various system loads.

C. This arrangement ensures that the heat load requirements are distributed appropriately between the loops.

D. This arrangement ensures that radiation monitoring is available for the Component Cooling Water System.

Question: 12 Point Value: 1.00 LP#:2AO708 Item #:8206

A Loss Of Coolant Accident has occured concurrent with a Loss of Offsite Power. Core Exit Saturation Margin is lowering rapidly.

Which one of the following actions should be performed to control Core Exit Saturation Margin?

A. Energize pressurizer heaters
Close the ADV's

B. Secure pressurizer heaters
Opening ADV's

C. Energize pressurizer heaters
Open ADV's

D. Secure pressurizer heaters
Closing ADV's

Question: 13 Point Value: 1.00 LP#:2AO710 Item #:8392

Given the following:

- The plant is at 90% power.
- "TURBINE VACUUM LO" alarm is lit.
- "EXHAUST HOOD TEMPERATURE HI" Alarm is lit
- Condenser vacuum is 7" Hg backpressure

Which one of the following actions should be taken?

A. Open the LP turbine seal regulator bypass valves to reduce exhaust hood temperature.

B. Increase turbine load to allow increased exhaust hood cooling.

C. Reduce turbine load as required to stablize condenser vacuum.

D. Trip the reactor, verify the turbine trip, and implement SPTA's SO23-12-1

Question: 14 Point Value: 1.00 LP#:2AO711 Item #:8210

During 100% power operation which one of the following conditions would require emergency boration of the reactor coolant system?

A. One CEA fails to drop into the core following a reactor trip.

B. Group 6 inserted to 110" while at 100% power.

C. Uncontrolled cooldown of the RCS of 27 deg F caused by excessive steam demand.

D. Uncontrolled cooldown of the RCS of 15 deg F caused by excessive Loss of Coolant Accident.

Question: 15 Point Value: 1.00 LP#:2AO713 Item #:5485

Unit 2 is operating at 75% power with all CEAs fully withdrawn, when a group 6 CEA drops to the bottom of the core.

Assume that rod recovery cannot begin for 60 minutes after the rod drops.

Which one of the following is the MINIMUM REQUIRED Power Reduction?

A. 10% power

B. 15% power

C. 20% power

D. 25% power

Question: 16 Point Value: 1.00 LP#:2AO714 Item #:8298

Given the following:

- 2RT-7870 Condenser Air Ejector radiation monitor setpoint is 1.05E-0
- Current steam generator tube leakage is 12 GPD
- Air Ejector/containment radiation HI alarm actuates
- 5 minutes following 2RT-7870 HI alarm, the reading has risen to 2.20E-0

Which one of the following actions is required for the above conditions?

A. Manually trip the reactor and carryout the SPTA's.

B. Commence a controlled plant shutdown and trip the unit at 35% reactor power.

C. Commence a rapid plant shutdown and trip the unit at 35% reactor power.

D. Commence a controlled plant shutdown.

Question: 17 Point Value: 1.00 LP#:2AO717 Item #:5752

The unit is operating in Mode 1 when an inadvertant SIAS actuated.

The plant conditions are:

- Containment Pressure 0.5 psig
- Pressurizer Level 56%
- Pressurizer Pressure 2250 psia
- REPCET Margin to Saturation 32 DEG. F.

Which one of the following actions should be taken?

A. Reduce Turbine Load to match with Reactor Power

B. Manually Trip the Reactor and secure all 4 RCP's

C. Place SIAS in BYPASS

D. Commence a rapid plant shutdown

Question: 18 Point Value: 1.00 LP#:2AO718 Item #:8203

1E Pressurizer pressure instrument PI-0101-1 (NR) on CR-57 failed high.

Which one of the following should be placed in bypass?

A. Pressurizer Pressure High
Pressurizer Pressure Low

B. Pressurizer Pressure Low
DNBR
LPD

C. Pressurizer Pressure High
DNBR
LPD

D. DNBR
LPD

Question: 19 Point Value: 1.00 LP#:2AO718 Item #:8208

A Loss of Vital Bus Y-002 has occurred.

Which one of the following actions should be conducted to verify a reactor trip is NOT required?

A. Perform a channel check on remaining channels.

B. Perform a functional unit test on the remaining channels.

C. Perform a daily surveillance on the remaining channels.

D. Perform a shiftly surveillance on the remaining channels.

Question: 20 Point Value: 1.00 LP#:2AO718 Item #:8296

Unit 2 is in MODE 1 when the lower detector of an excore safety Channel 'A' fails.

Which one of the following describes ALL of the Channel 'A' Plant Protection System functional units which must be placed in bypass?

A. Local Power Density - High
DNBR - Low

B. DNBR - Low
Log Power Level - High

C. Linear Power Level - High
Local Power Density - High
DNBR - Low

D. Linear Power Level - High
Local Power Density - High
Log Power Level - High

Question: 21 Point Value: 1.00 LP#:2AO718 Item #:8277

Given the following:

- Unit 2 is operating at 100%
- DNBR is in bypass on channel A and in trip on channel C
- LPD is in bypass on channel A and in trip on channel C
- A loss of Y002 has just occurred

Which one of the following actions should be taken assuming the unit is still at power?

A. Commence a rapid plant shutdown.

B. Place channel A in a trip condition.

C. Transfer Y002 to its alternate source.

D. Place channel C in a bypass condition.

Question: 22 Point Value: 1.00 LP#:2AO720 Item #:8176

Refueling operations are in progress. Maintenance is attempting to move a large welder into containment thru the personnel hatch.

Which one of the following will ensure containment integrity is maintained during this operation?

A. Both ramps installed and inner door closed

B. Both ramps installed and both doors closed

C. Inner ramp installed and both doors closed

D. Outer ramp installed and one door closed

Question: 23 Point Value: 1.00 LP#:2AO720 Item #:8186

Core Off load is in progress. A spent fuel assembly is being moved from the containment to the spent fuel pool. During this fuel movement the upender operator informs the refueling SRO that Reactor Vessel Pool Seal pressures read 61 PSI and 0 PSI.

Which one of the following actions should be taken by the refueling SRO?

A. Leave the fuel assembly in the upender and secure core alterations.

B. Continue with fuel movement until fuel assembly is in the spent fuel pool racks and then secure core alterations.

C. Return the fuel assembly to the core and then secure core alterations.

D. Continue with fuel movement and log the seal pressure twice per shift in the CO log.

Question: 24 Point Value: 1.00 LP#:2AP001 Item #:0135

Given the following:

- An operator is working in the control room on 11/8/95.
- He realizes he failed to make an entry in his log the previous day, 11/7/95.

Which one of the following methods should the operator use to correct the error?

A. On the bottom of the previous day 11/7/95, enter the current time in the left hand margin and begin the entry with the words "Late Entry."

B. On the bottom of the previous day 11/7/95, enter the words "Late Entry" in the left hand margin and begin the entry with the actual time the event happened.

C. On the current day 11/8/95 enter the current time in the left hand margin and begin the entry with the words "Late Entry" and the actual time the event happened.

D. On the current day 11/8/95 enter the words "Late Entry" in left hand margin and begin the entry with the actual time the event happened.

Question: 25 Point Value: 1.00 LP#:2AP101 Item #:5149

Use of a leverage device is allowed on:

A. 20" Motor Operated Valve (MOV)

B. 6" Diaphragm Valve

C. 2" Kerotest Valve

D. 10" Manual Globe Valve

Question: 26 Point Value: 1.00 LP#:2AP106 Item #:5323

Which one of the following could be performed without a Maintenance Order?

A. Resetting a tripped deluge valve.

B. I&C adjusting feedwater heater level controllers.

C. In-service Tests that do not remove equipment from service.

D. Meggering Non-Important-to-Safety motors.

Question: 27 Point Value: 1.00 LP#:2BF710 Item #:8276

Annunciator 57C40, "LIQUID RADIATION MONITOR FAILURE" is received on Unit 2. The Operator determines that the Neutralization Sump Effluent Radiation Monitor, 3RE-7817 is inoperable.

Which one of the following actions must be accomplished to continue discharging to the outfall?

A. Composite samples must be taken and analyzed for gross radioactivity.

B. Grab samples must be taken and analyzed for gross radioactivity.

C. At least 2 independent samples are drawn and analyzed by 2 independent technicians.

D. At least 2 technically qualified members of the facility staff independently verify release line valving.

Question: 28 Point Value: 1.00 LP#:2EO703 Item #:5515

Why is it recommended to initiate simultaneous hot/cold leg injection BEFORE 4 hours have elapsed following a LOCA?

A. Increased HPSI flow satisfies Core Cooling requirements.

B. Increased HPSI flow satisfies Shutdown Margin requirements.

C. Boric acid precipitation can occur and hinder cooling in the core.

D. Boric acid precipitation can occur and decrease Shutdown Margin.

Question: 29 Point Value: 1.00 LP#:2EO705 Item #:8209

Which one of the following are the most restrictive conditions for shutdown margin with a steam line break?

A. BOL with Tcold at program temperature of 545 deg F

B. EOL with Tcold at program temperature of 545 deg F

C. BOL with Tcold at program temperature of 553 deg F

D. EOL with Tcold at program temperature of 553 deg F

Question: 30 Point Value: 1.00 LP#:2EO705 Item #:5759

Which one of the following is a reason for lowering pressure in the unaffected Steam Generator prior to dryout of the affected Steam Generator during a ESDE?

A. To prevent over cooling of the RCS.

B. To prevent loss of inventory in the steam generator.

C. To prevent loss of pressurizer pressure.

D. To prevent rapid repressurization of RCS.

Question: 31 Point Value: 1.00 LP#:2EO709 Item #:8204

Given the following:

- Reactor trip occurred from 100% power
- Bus 2A04 is faulted
- "Diesel Generator Failure Follow-up Actions" are in progress

Which one of the following describes the operation required for the 2XR1 feeder breaker open pushbutton and bases for the response regarding this action?

A. Depress the OPEN pushbutton to reset trip conditions and automatically close the breaker.

B. Depress the OPEN pushbutton to reset the overcurrent trip allowing a re-close attempt.

C. Do NOT operate the OPEN pushbutton because this resets the under voltage trip and allows the unit cross-tie breaker from 3A04 to close.

D. Do NOT operate the OPEN pushbutton because the overcurrent trip will reset allowing the DG output breaker to close to a fault.

Question: 32 Point Value: 1.00 LP#:2EO712 Item #:8271

Given the following:

- Standard Post Trip Actions are in progress
- All CEA's are fully inserted
- Megawatt output is NOT lowering
- Feedwater is on RTO with proper actuation

Which one of the following actions should be performed by the operator?

A. Manually trip the reactor

B. Close the main steam isolation valves

C. Close the high pressure and low pressure stop valves

D. Close the high pressure and low pressure governor valves

Question: 33 Point Value: 1.00 LP#:2EO712 Item #:8272

Unit 2 has experienced a Station Blackout. Communication with the Energy Control Center is unavailable.

Which one of the following states the proper actions required to restore offsite power?

A. Open all circuit breakers and pickup on the first available SCE 220 kv line.

B. Open all circuit breakers and pickup on the first available SDG&E 220 kv line.

C. Open all circuit breakers on N/W bus and pickup on the first available SCE 220 kv line.

D. Open all circuit breakers on S/E bus and pickup on the first available SDG&E 220 kv line.

Question: 34 Point Value: 1.00 LP#:2EO712 Item #:8270

A reactor trip just occurred on Unit 2.

The operators have initiated the Standard Post Trip Actions.

Plant conditions are as follows:

- Two CEAs are not fully inserted
- Pzr level is at 26%
- Pzr Press is at 1950 psia
- S/G water levels are at 29% with MFW RTO actuated
- Containment temperature is 105°F
- Containment pressure is 1.0 psig

Which one of the following is the correct operator action to be taken in the SPTAs?

A. De-energize B15 and B16

B. Reenergize Pzr heaters to raise RCS pressure

C. Override AFW system to feed both S/Gs at greater than 200 gpm

D. Ensure containment normal cooling is functioning properly

Question: 35 Point Value: 1.00 LP#:2EO713 Item #:8334

A LOCA occured 90 minutes ago. You are monitoring Floating Step 4 "two-phase heat removal established."

Which one of the following temperature indications is required to be monitored during "Two-Phase Heat Removal?"

A. Cold leg temperature

B. Hot leg temperature

C. Core exit temperature

D. Heated junction thermocouples

Question: 36 Point Value: 1.00 LP#:2EO713 Item #:0161

Given the following:

- Unit 3 tripped from 100% power 60 minutes ago
- Reactor Coolant Temp is 535 deg F
- Reactor Coolant Pressure is 1000 PSIA
- Containment Pressure is 3.1 PSIG
- Pressurizer Level is 21% and slowly rising

Which one of the following is the correct number of Reactor Coolant pumps that should be secured?

A. None

B. One

C. Two

D. Four

Question: 37 Point Value: 1.00 LP#:2EO713 Item #:0436

Unit 2 tripped 90 minutes ago. You are in EOI SO23-12-3 LOCA attachment for "VOID COMPENSATION".

Which one of the following is the purpose of that attachment?

A. To compensate for RCP restart void collapse.

B. To correct the RVLMS for accurate readout on QSPDS and CFMS

C. To ensure that there is sufficient inventory to cover the pressurizer heaters.

D. To verify that the core exit thermocouples have sufficient liquid contact to give an accurate response.

Question: 38 Point Value: 1.00 LP#:2EO713 Item #:8280

Given the following:

- The unit was tripped 30 minutes ago and a LOCA was diagnosed
- RCS temperature is 525 degress F.
- RCS pressure is 1600 psia
- Power has been lost to the switchyard
- 1E power is being supplied by the diesel generators
- Voids have formed in the head

Which one of the following will cause greater cooling in the reactor vessel head?

A. Increase RCS pressure

B. Start a reactor coolant pump

C. Secure Charging pump

D. Lower RCS pressure

Question: 39 Point Value: 1.00 LP#:2EO713 Item #:8285

Given the following:

- The plant tripped at 1430 hrs. from 100% power.
- A LOCA was diagnosed
- SO23-12-3 attachment 3 cooldown & depressurization is in use

At 1530 per procedure, which one of the following is the MINIMUM RCS temperature allowed?

A. 465 Degress F.

B. 455 degress F.

C. 445 degress F.

D. 435 degress F.

Question: 40 Point Value: 1.00 LP#:2EO716 Item #:4042

A loss of Forced Circulation has occurred as a result of a Loss of Offsite Power. You are attempting to establish natural circulation in accordance with Emergency Operating Instruction SO23-12-7, Loss of Forced Circulation/Loss of Offsite Power.

Which one of the following conditions will require a "Response Not Obtained" action when performing verification of Natural Circulation?

A. Loop delta-T at 30 degrees-F and stable.

B. T-hot/Representative Core Exit Thermocouples delta-T at 5 degrees-F and stable.

C. Reactor Vessel plenum level at 82% and constant.

D. Core Exit Saturation Margin at 21 degrees-F and slowly rising.

Question: 41 Point Value: 1.00 LP#:2EO720 Item #:8259

Unit 2 entered the Station Blackout procedure SO23-12-8 following a plane crash near the switchyard.

Which one of the following is the reason for ensuring TS-2 DC 127F1 through 127F4 knife switches at diesel generator bus PT cubicle are open?

A. Reset the LOVS signal

B. Reset the SIAS signal

C. Reset the undervoltage flags

D. Reset the overcurrent flags

Question: 42 Point Value: 1.00 LP#:2HP204 Item #:2138

Given the following:

- A LOCA is progress
- You as the SS require an operator to enter a high radiation area of 125 mr/hr to secure a running pump.

Which one of the following is the maximum length of time that he may remain in this room and NOT exceed his SONGS administrative dose control limits? Assuming no prior exposure this year.

A. 4 Hours

B. 8 Hours

C. 12 Hours

D. 16 Hours

Question: 43 Point Value: 1.00 LP#:2LC705 Item #:5746

Which one of the following situations can be accomplished without an independent verification of a valve lineup?

A. When preparing to enter a Mode where the valve is required to be operable.

B. When venting a system, opening the valve and removing the cap.

C. During the installation and removal of a temporary modification involving a valve in the waste water system.

D. Work Authorization installation and removal of Red Man-at-Work tags on valves on Auxiliary Feedwater System.

Question: 44 Point Value: 1.00 LP\ LC705 Item #:8348

Which one of the following would require a complete system lineup verification per SO123-0-23 "Control of System Aligments?"

A. A system misalignment was caused by operator error.

B. A system misalignment was caused by sabotage.

C. A system misalignment was discovered during a WAR return to service.

D. A system misalignment was discovered during a refueling outage.

Question: 45 Point Value: 1.00 LP#:2LC706 Item #:3709

A reactor trip has occurred 10 seconds ago on Unit 2. The cause of the trip was an overfeeding of steam generator E-089. Present steam generator levels are: E-089 @ 85% NR, and E-088 @ 30% NR.

Which one of the following will be the flow demand signal sent to the main feedwater regulating valve for E-089 (2FV-1111)?

A. 50%

B. 25%

C. 5%

D. 0%

Question: 46 Point Value: 1.00 LP#:2LC706 Item #:4019

Which one of the following Engineered Safety Features Actuation Systems (ESFAS) signals are generated by an AUTOMATIC Safety Injection Actuation Signal (SIAS) but **NOT** by a MANUAL SIAS?

A. Main Steam Isolation Signal (MSIS).

B. Containment Cooling Actuation Signal (CCAS).

C. Main Feedwater Isolation Signal (MFWIS).

D. Non Critical Loop CCW Isolation Signal (CCIS).

Question: 47 Point Value: 1.00 LP#:2LC820 Item #:8198

An editorial procedure change is required on an emergency operating instruction.

Which one of the following is the correct way to complete this change?

A. Temporary Change Notice (TCN)

B. Revision

C. Procedure Modification Permit (PMP)

D. Abnormal Alignment/Evolution Document

Question: 48 Point Value: 1.00 LP#:2LC820 Item #:8200

Which one of the following types of procedures can have steps left blank if not applicable, however should be frequently re-checked to ensure action is taken when applicable?

A. Emergency Operating Instruction

B. Abnormal Operating Instruction

C. Normal Operating Instruction

D. Normal Surveillance Procedures

Question: 49 Point Value: 1.00 LP#:2LC820 Item #:8455

Given the following:

- Unit is at 100% power
- Radwaste release is in progress
- I&C is performing quarterly PPS testing

Which one of the following should be maintained in the "Procedures in Use" section of the four section "In Use" file maintained in the control room?

A. SO23-5-1.7 "Power Operations."

B. Radwaste release permit

C. I&C surveillance procedure

D. Completed procedures NOT requiring PMP approval

Question: 50 Point Value: 1.00 LP#:2LC821 Item #:7135

Which ONE of the following maintenance activities would the Shift Superintendent allow to be performed by an operator without initiating a Maintenance Order:

A. Adjust packing on HV-9300 RWST outlet valve.

B. Tighten bolts on a leaking flange on the Saltwater Cooling System piping.

C. Adjust packing leakoff on the screen wash pump.

D. Adjust packing on Reheater Main Steam Drain Tank Vent Manual Block Valve.

Question: 51 Point Value: 1.00 LP#:2LC823 Item #:8189

Which one of the following may sign authorizations as "Plant Management Staff-Operations" on QA program affecting or safety-related procedures?

A. Individuals designated by a Single X

B. Individuals designated by a Double X

C. On Shift Shift Superintendent with Double X

D. On Shift Shift Superintendent With Single X

Question: 52 Point Value: 1.00 LP#:2LC823 Item #:8410

An excessively high MOV torque switch setting could cause which one of the following?

A. Incorrect valve position of a jog valve

B. Motor overload and possible motor burn up

C. Inability to disengage manual operator

D. Inability to move a valve off its closed seat

Question: 53 Point Value: 1.00 LP#:2LC830 Item #:8201

The units are in the following configuration; Unit 2 is in Mode 1 and Unit 3 is in Mode 5.

Per SO123-0-30 "Shift Manning", which one of the following describes the minimum shift crew composition for both units?

A. SS 1, CRS 1, RO 3, AO 5, STA 0

B. SS 0, CRS 2, RO 2, AO 4, STA 1

C. SS 1, CRS 2, RO 3, AO 3, STA 1

D. SS 1, CRS 2, RO 4, AO 5, STA 1

Question: 54 Point Value: 1.00 LP#:2LC840 Item #:8192

Hoses used for chemicals, such as caustic and acid, will be tagged with labels that read "FOR CHEMICAL USE ONLY".

Which one of the following is the correct tag for chemical use?

A. Red with white lettering

B. White with red lettering

C. Orange with white lettering

D. White with orange lettering

Question: 55 Point Value: 1.00 LP#:2NI701 Item #:5248

Unit 3 is at 100% full power. The D.C. control power fuses for HPSI pump P018 have blown and P018 is in the process of being tagged out. P018 is still aligned to Train "A" and racked in when a SIAS actuation signal is received.

Which one of the following statements below indicates the proper response of the HPSI pumps in the described configuration?

A. HPSI pump P019 will auto start

B. HPSI pumps P017 and P019 will auto start

C. HPSI pumps P018 and P019 will auto start

D. HPSI pump P017 will auto start

Question: 56 Point Value: 1.00 LP#:2NI701 Item #:0042

Unit 3 is in Mode 3 with RCPs P001 and P004 cleared for maintenance. Can P-002 be cleared per maintenance request?

A. Yes, all pumps can be cleared.

B. Yes, as long as there is one pump available.

C. No, there must be one pump in each loop available in Mode 3.

D. No, P-002 can only be stopped for 1 hour in Mode 3.

Question: 57 Point Value: 1.00 LP#:2NI701 Item #:5231

When initially performing a pressurizer heatup (drawing a pressurizer steam bubble), the RCS is in a solid condition and RCS pressure is being controlled by the letdown backpressure regulating valves. What are the expected operator actions should the letdown backpressure regulating valves become full open in automatic and RCS pressure continues to increase?

A. Initiate auxiliary spray flow to decrease RCS pressure.

B. Stop charging pumps and/or turn off pressurizer heaters.

C. Take manual control and throttle closed the letdown flow control valves to prevent lifting letdown reliefs.

D. Take manual control and throttle closed the letdown backpressure regulating valves.

Question: 58 Point Value: 1.00 LP#:2NI702 Item #:8191

All full length CEA's are required to have a maximum individual CEA drop time. The drop time shall be from the time power is interrupted to the CEA drive mechanism until the CEA reaches its 90 percent insertion position.

This requirement is in effect whenever the reactor is in Mode 1 or 2 with:

A. Average temperture greater than 545 deg F and Three reactor coolant pumps in service

B. Average temperature greater than 545 deg F and Four reactor coolant pumps in service

C. Average temperature greater than 520 deg F and Three reactor coolant pumps in service

D. Average temperature greater than 520 deg F and Four reactor coolant pumps in service

Question: 59 Point Value: 1.00 LP#:2NI703 Item #:8279

Unit 2 is operating at 100% power when alarm 50A31 "PRESSURIZER SAFETY VALVE OUTLET TEMP HI " comes in. The ARP allows continuing operation provided RCS pressure has not dropped below 2200 psia.

Which one of the following is the bases for this limit?

A. Minimizes operation of heaters and spray valves.

B. The LPD safety analysis does not allow operation below 2200 psia.

C. A reactor trip with pressure below 2200 psia will result in RCS pressure lowering to SIAS setpoint.

D. A normal power maneuver will reduce RCS pressure below the SIAS trip setpoint

Question: 60 Point Value: 1.00 LP#:2NI704 Item #:0247

Select the statement that best describes the reason for maintaining 15" minimum overlap between Group 5 and Group 6 CEA's with Group 5 being the most withdrawn during power operations.

A. Maintaining the overlap prevents the Plant Monitoring System (PMS) from "locking up".

B. Maintaining the overlap permits the CPC's to continue calculating azimuthal tilt.

C. Maintaining the overlap permits the operator to bypass the logging requirements of CEA insertions into the core.

D. Maintaining the overlap prevents a CPC trip on "out of sequence".

Question: 61 Point Value: 1.00 LP#:2NI705 Item #:8434

Given the following:

- RCS temperature is 190 Deg F.
- Chloride = 0.06
- Fluoride = 0.18
- Dissolved Oxygen = 0.07 PPM

Which one of the following is correct concerning any futher heatup of the RCS per Technical Specifications?

A. Heatup above 200 Deg F. is NOT allowed until fluoride is less than 0.15 PPM.

B. Heatup above 200 deg F. is allowed as long as fluoride is restored to less than 0.15 PPM within 24 hours.

C. Heatup above 250 deg F. is NOT allowed until dissolved oxygen is less than 0.05 PPM.

D. Heatup above 250 deg F. is allowed as long as dissolved oxygen is restored to less than 0.05 PPM within 24 hours.

Question: 62 Point Value: 1.00 LP#:2NI706 Item #:0277

Containment closure time is reduced from two hours to 45 minutes when only the cold leg is vented.

Which one of the following is the bases for this reduction in time?

A. The cold leg vents are closer to the access door.

B. Inventory loss is faster through the cold legs.

C. Shutdown cooling returns to the cold leg.

D. There are twice as many cold leg nozzle dams which could fail.

Question: 63 Point Value: 1.00 LP#:2RP177 Item #:8432

Given the following:

- The reactor has been shutdown for 10 days
- RCS level is 17" as indicated on RWLI 1520N (Narrow range refueling water level instrument)
- RCS core exit temperature is 138 deg F.
- Refueling has not commenced
- RCS hot leg vents are open
- No RCS makeup exists from any source
- Shutdown cooling is in service

Which one of the following is the correct Time-To-Boil margin? (attachment attached)

A. 18.33 minutes

B. 19.15 mimutes

C. 20.16 minutes

D. 22.80 minutes

CALCULATION OF RCS TIME-TO-BOIL MARGIN

NOTES:
1. The times in this attachment assume RCS Hot Leg Vent open, no Cold Legs open, no makeup to the RCS from any source, and decay heat load following Reactor operation at 100% power. (Ref. 2.4.1.30)
2. RX Core Uncovery time includes Time-To-Boil.
3. Time-To-Boil at other than 120°F or for new fuel is addressed on the last page of this attachment.
4. For conservatism: values at 26 inches should be used for all levels between 26 and 36 inches, and values at 17 inches should be used for all levels between 17 and 26 inches.
5. Table values may be interpolated between days after shutdown.

CAUTION If a RCP is opened for ***Seal Heat Exchanger*** replacement, then until a Hot Leg Vent is established at a ***S/G Hot Leg Manway*** (nozzle dam removed), do not credit RCS inventory above 27 inches NR in the Time to Core Uncovery calculations (i.e., inventory above 27 inches will be lost to spillage out the Cold Leg opening). [Ref. 2.4.1.31]

See next page for a Refueling Outage drain after RX operation ≤5% Power and ≥65 Days since 100% Power

		DAYS AFTER SHUTDOWN					
		5	6	7	8	9	10
S/G Tubes are drained. Time-To-Boil under these conditions is the same whether or not S/G Nozzle Dams are in.	LI-152ON	TIME-TO-BOIL FROM 120°F *(minutes)*					
	42"	21.0	22.3	23.6	25.0	26.2	27.6
	36"	20.4	21.7	23.0	24.4	25.7	27.0
	26"	19.2	20.4	21.6	22.8	24.0	25.2
	17"	17.4	18.5	19.6	20.6	21.7	22.8

CALCULATION OF RCS TIME-TO-BOIL MARGIN (Continued)

NOTE: The following table values multiplied by 60 will convert to minutes.

RCS CONFIGURATION			DAYS AFTER SHUTDOWN						
			10-29	30-89	≥90	5-9	10-29	30-89	≥90
RWLI LI-152ON	STEAM GENERATOR STATUS		TIME-TO-BOIL FROM 120°F *(hours)*			TIME TO CORE UNCOVERY FROM 120°F *(hours)*			
42"	Tubes Empty		0.46	0.73	1.32	8.99	11.9	18.8	34.0
42"	Nozzle Dams In		0.46	0.73	1.32	4.79	6.33	9.99	18.1
36"	Tubes Empty		0.45	0.71	1.29	8.05	10.6	16.8	30.5
36"	Nozzle Dams In		0.45	0.71	1.29	4.29	5.67	8.95	16.2
26"	Tubes Empty		0.42	0.66	1.20	6.40	8.47	13.4	24.3
26"	Nozzle Dams In	Refueling Outage after Reactor operation ≤5% Power and ≥65 Days since 100% Power		1.88	1.88			20.6	20.6
26"	Tubes Empty			1.88	1.88			38.4	38.4
26"	Nozzle Dams In		0.42	0.66	1.20	3.45	4.55	7.19	13.0
17"	Tubes Empty		0.38	0.60	1.10	4.64	6.13	9.68	17.6
17"	Nozzle Dams In		0.38	0.60	1.10	2.51	3.32	5.24	9.49

CONTINUED ON NEXT PAGE

CALCULATION OF RCS TIME-TO-BOIL MARGIN (Continued)

Determine time-to-boil margin from any core exit temperature, as follows:

BM_{act} = BM_{120} X Tcf X Ncf X 60 min/hour (if in hours)

BM_{act} = _____ minutes

Where:

BM_{act} = Actual Time To Boil Margin for present (or target) Core Exit Temperature and RCS level.

BM_{120} = Time to Boil Margin for 120°F and RCS level from the table on Page 1 or 2 of this attachment.

Tcf = Temperature Correction Factor: Use the following temperature correction factor which is nearest to present Core Exit Temperature or interpolate. (Ref. 2.4.1.20)

75°F = 1.49	95°F = 1.27	115°F = 1.06	135°F = 0.84
80°F = 1.44	100°F = 1.22	120°F = 1.00	140°F = 0.78
85°F = 1.38	105°F = 1.16	125°F = 0.95	145°F = 0.73
90°F = 1 33	110°F = 1.11	130°F = 0.89	150°F = 0.68

Ncf = New Fuel Correction Factor: Use the following decay heat correction factor which represents the present Reactor Core status. (Ref. 2.4.1.20)

All fuel is irradiated: 1.0

1/3 of fuel is not irradiated: 1.5

1/2 of fuel is not irradiated: 2.0

Refueling Outage after RX operation ≤5% Power and ≥65 Days since 100% Power: 1.0

N TCN

Question: 64 Point Value: 1.00 LP#:2RP177 Item #:8433

Given the following:

- Unit 2 is on Shutdown Cooling
- RCS draindown is in progress
- QSPDS is showing voids on HJTC #1, #2, #3, #4 & #5
- HJTC #6, #7, & #8 are covered

Which one of the following would be the current RCS level? (attachment attached)

A. Between the vessel flange and the S/G manway overflow.

B. Between the top of the hot leg and the NES S/G nozzle dam in.

C. Between the ABB S/G nozzle Dam out and centerline of the hot leg.

D. Between the hot leg centerline and the top of the fuel region.

RCS LEVEL CORRELATION CHART

REFERENCE	RWLI LI-1520W	RWLP	RWST LEVEL	PZR LEVEL	HJTC [1]	ABOVE FUEL	PLANT ELEV.
RWLI on Scale	+25.00'		99.8%	43%		452.5"	62'6"
Gallons Tracking	+16.33'		72.7%	15%		348.5"	53'10"
PZR Off Scale	+12.08'		59.5%	0%		297.5"	49'7"
RV Head Middle	+3.375'		32.3%		# 1	193.0"	40'10.5"
RV Head RWLP	+1.833'	# 1	27.5%	WR SIGHT GLASS	.	174.5"	39'4"
Above Flange	+0.790'	.	24.3%		# 2	162.0"	38'3.5"
Vessel Flange	0.000'	.	21.8%	0.000'	.	152.5"	37'6"
Below Flange	-0.500'	# 2	20.2%	-0.500'	.	146.5"	37'0"
RV HJTC	-1.790'	.	16.2%	-1.790'	# 3	131.0"	35'8.5"
RCP Vent Overflow	-2.000'	.	15.6%	-2.000'	.	128.5"	35'6"
RV RWLP	-2.167'	# 3	15.1%	-2.167'	.	126.5"	35'4"
RV HJTC	-2.875'	.	12.9%	-2.875'	# 4	118.0"	34'7.5"
RIC	-3.000'	.	12.5%	-3.000'	.	116.5"	34'6"
Above Hot Leg	-3.767'	# 4	10.1%	-3.767'	.	107.3"	33'8.8"
S/G Manway Ovfl.	-3.850'	.	9.8%	-3.850'	.	106.3"	33'7.8"

REFERENCE	RWLI LI-1520W	RWLP	RWLI LI-1520N		WR SIGHT GLASS	HJTC [1]	ABOVE FUEL	PLANT ELEV.
MIDLOOP COND Top of Hot Leg	-4.875'	.	42"	SIGHT GLASS	-4.875'	# 5	94"	32'7.5"
RCP Casing Flange	-4.958'	.	41"		-4.958'	.	93"	32'6.5"
Hot Leg RWLP	-5.292'	# 5	37"		-5.292'	.	89"	32'2.5"
NORMAL LEVEL	**-5.375'**	.	**36"**		**-5.375'**	.	**88"**	**32'1.5"**
Hot Leg RWLP	-5.542'	# 6	34"		-5.542'	.	86"	31'11.5"
Hot Leg RWLP	-5.792'	# 7	31"		-5.792'	.	83"	31'8.5"
S/G Cold Leg Nozzle Overflow	-5.958'	.	29"		-5.958'	.	81"	31'6.5"

CONTINUED ON NEXT PAGE

[1] Determine from QSPDS Page 721; Do not use inoperable points.

RCS LEVEL CORRELATION CHART (Continued)

REFERENCE	RWLI LI-1520W	RWLP	RWLI LI-1520N		WR SIGHT GLASS	HJTC [1]	ABOVE FUEL [2]	PLANT ELEV.
Hot Leg RWLP	-6.042'	# 8	28"	SIGHT GLASS	-6.042'	.	80"	31'5.5"
NES S/G Nozzle Dam In/Out	-6.208'	.	26"		-6.208'	.	78"	31'3.5"
Hot Leg RWLP	-6.292'	# 9	25"		-6.292'	.	77"	31'2.5"
Hot Leg RWLP	-6.542'	# 10	22"		-6.542'	.	74"	30'11.5"
Centerline	-6.625'	.	21"		-6.625'	# 6	73"	30'10.5"
Hot Leg RWLP	-6.792'	# 11	19"		-6.792'	.	71"	30'8.5"
ABB-CE S/G Nozzle Dam In/Out	-6.917'	.	17.5"		-6.917'	.	69.5"	30'7"
MINIMUM LEVEL	-6.959'	.	17"		-6.959'	.	69"	30'6.5"
CAUTION >>> ENTERING SDCS PUMP VORTEX ZONE <<<								
Hot Leg RWLP	-7.042'	# 12	16"	SIGHT GLASS	-7.042'	.	68"	30'5.5"
Hot Leg RWLP	-7.292'	# 13	13"		-7.292'	.	65"	30'2.5"
Hot Leg RWLP	-7.542'	# 14	10"		-7.542'	.	62"	29'11.5"
Hot Leg RWLP	-7.791'	# 15	7"		-7.791'	.	59"	29'8.5"
Hot Leg RWLP	-8.042'	# 16	4"		-8.042'	.	56"	29'5.5"
Hot Leg Bottom	-8.375'	.	0"		-8.375'	# 7	52"	29'1.5"
Below Hot Leg		# 17				.	40"	28'1.5"
Below Hot Leg		# 18				.	35"	27'8.5"
Below Hot Leg						# 8	32"	27'5.5"
Active Fuel [2]							0"	24'9.5"

[1] Determine from QSPDS Page 721; Do not use inoperable points.
[2] Approximately 18.5" below top of Fuel Assemblies. (Ref. 2.4.1.14)

Question: 65 Point Value: 1.00 LP#:2RP181 Item #:4083

The plant is operating in Mode 1 at 100% power. Annunciators 56A04 - DNBR LO RPS channel trip and 56A03 - LOCAL POWER DENSITY channel trip are received. Further investigation reveals that the DNBR and LPD trip lights are illuminated for Channel "A" CPC and the pretrip lights are extinguished.

Which one of the following choices below could have caused this?

A. Hot Pin Axial Shape Index, Point ID 187 = +0.53

B. Loop 1 cold leg temperature, Point ID 160 = 553 deg F.

C. Loop 2 hot leg temperature, Point ID 163 = 605 deg F.

D. Pressurizer Pressure, Point ID 164 = 2236 psia

Question: 66 Point Value: 1.00 LP#:2RP209 Item #:5516

Steam Generator Tube Rupture (STGR) requires the cooldown of the RCS to a T-Hot less than 530 degrees-F using both Steam Generator(s).

Which one of the following is the purpose of this action?

A. To minimize breakflow and increase subcooled margin.

B. To minimize breakflow and decrease subcooled margin.

C. To prevent subsequent lifting of any of the S/G safeties after the affected S/G is isolated.

D. To prevent subsequent lifting of the pressurizer safeties after the affected S/G is isolated.

Question: 67 Point Value: 1.00 LP#:2RP210 Item #:5524

After a loss of feedwater event, the operator maintains AFW flow at 130-150 gpm for 5 minutes.

Which one of the following is the bases for filling the steam generators at this rate?

A. This is a gradual fill method to allow for equalizing temperature across the S/G.

B. 5 minutes is the required time for minimizing the possibility of a water hammer event to the Steam Generator can deck.

C. 5 minute duration allows for thorough heat soak of the feedring.

D. 5 minute duration follows the "twice full" criteria of the feedring.

Question: 68 Point Value: 1.00 LP#:2RP227 Item #:7103

Which ONE of the following describes a condition which would require manually tripping the Reactor, due to a high voltage being applied to CEDM Coils?

Assume: A CEDMCS Logic Power Voltage Low Alarm Annunciate light is lit.

A. The Local Operator discovers all ACTM Cards have the UG Engaged light ILLUMINATED

B. The Local Operator discovers all CEA Disconnect Switches CLOSED

C. The Local Operator discovers all CEDM Timer Failure Alarm lamps ILLUMINATED

D. The Local Operator discovers all Reactor Trip Breakers CLOSED

Question: 69 Point Value: 1.00 LP#:2TA702 Item #:8278

Emergency Operating Instruction SO23-12-1, "Standard Post Trip Actions," requires verifying that RCS Tc, is less than 555 degrees F.

Which one of the following describes the basis for this requirement?

A. To ensure that Main Steam Isolation Signal (MSIS) does not occur.

B. To ensure that the steam generators are removing RCS heat.

C. To prevent uncontrolled filling of the steam generators.

D. To prevent an imbalance in steam generators cooldown.

Question: 70 Point Value: 1.00 LP#:2TS701 Item #:8349

Technical Specification 3.6.2 Depressurization and Cooling Systems, Containment Spray System, ensures containment depressurization and cooling capability are available.

Which one of the following accidents per Technical Specification 3.6.2 BASIS requires that depressurization and cooling capability be available?

Assume all events take place inside containment.

A. Loss of Coolant Accident

B. Main Steam Line Break

C. Loss of Feedwater

D. Steam Generator Tube Rupture

Question: 71 Point Value: 1.00 LP#:2XA202 Item #:8448

Given the following:

- RCP control Bleedoff Flow is 15 GPM into containment.
- Reactor Coolant Pump vapor seal cavity pressure is 5 psia

Which one of the following actions should be directed by the Control Room Supervisior?

A. Continue normal plant operation

B. Monitor affected RCP seal data on PMS and continue normal plant operation

C. Commence a normal plant shutdown and 5 seconds after tripping the reactor, trip the affected RCP

D. Immediately trip the reactor and 5 seconds after tripping the reactor, trip the affected RCP

Question: 72 Point Value: 1.00 LP#:2XA203 Item #:0062

Which one of the following statements describes the conditions that must be met to establish SDC in Mode 4 when one train of Containment Emergency Coolers is inoperable?

A. There are no special conditions that must be met.

B. Technical Specification 3.0.3 entry must be approved.

C. The other train of Emergency Coolers must be placed in service.

D. Both Trains of CCW must be Operable.

Question: 73 Point Value: 1.00 LP#:2XA206 Item #:0023

What effect will high level in the pressurizer have on the letdown throttle valves, backpressure control valves and charging flow?

NOTE: ASSUME ALL CONTROLS IN AUTOMATIC

A. Letdown throttle valve will open fully, backpressure valves will open fully and charging will decrease to minimum.

B. Letdown throttle valve will open fully, backpressure valves will open fully and charging will remain the same.

C. Letdown throttle valves will throttle close, backpressure valves will throttle close and charging will remain the same.

D. Letdown throttle valves will open further, backpressure valves will open slightly and charging will decrease to minimum flow.

Question: 74 Point Value: 1.00 LP#:2XA209 Item #:8202

Which one of the following describes the design basis for the Containment Dome Air Circulator Subsystem?

A. Remove accident heat energy from containment atmosphere in order to maintain pressure below the containment design pressure.

B. Provide mixing of the containment atmosphere to prevent localized accumulation of hydrogen.

C. Maintain the containment dome surface temperature less than the design temperature of 150 deg F.

D. Prevent steam voids from forming near the top of containment and causing overpressure conditions.

Question: 75 Point Value: 1.00 LP#:2XAL07 Item #:6244

Given the following:

- P-018 is aligned to train A
- SIAS and CCAS are actuated
- All HPSI pumps are operating
- All HPSI flow paths are aligned
- SO23-12-3 LOCA procedure is in use
- Throttle stop is in progress (all conditions have been met)

Which one of the following explains why HPSI pump P-017 override pushbutton is not required to be pushed to secure P-017?

A. P-017 did not receive an auto start signal and was manually started

B. P-017 was manually started prior to its auto start signal

C. P-017 had an auto start failure and was manually started

D. P-017 auto started on valid SIAS & CCAS signal.

Question: 76 Point Value: 1.00 LP#:2XAR06 Item #:4229

The plant is at 100% steady state.
All systems aligned for "Automatic" Operation.
A 200 gpm LOCA occurs.

Which ONE of the following describes the automatic response of the CVCS system to the LOCA? (Assume NO operator action)

A. Letdown flow increases, all Charging Pumps start as PZR level decreases below setpoint. A Reactor trip/SIAS actuates. Charging pump suction swaps to the RWST and letdown goes to "Minimum".

B. Letdown flow goes to "Minimum". Charging Pump suction shifts to the PAMU Tanks due to low VCT level. A RX trip/SIAS actuates, letdown isolates and all Charging Pumps start.

C. Letdown flow goes to "Minimum". All Charging Pumps "Auto" start. A RX trip/SIAS actuates. Letdown isolates and Charging Pump suction is supplied by the Boric Acid Makeup Pumps.

D. Letdown isolates. All Charging Pumps "Auto" start. A RX trip/SIAS occurs. Charging Pump Suction swaps to the Boric Acid Gravity Feeds when VCT level lowers to 6%.

Question: 77 Point Value: 1.00 LP#:2XAR07 Item #:7712

Given the following:

- A Large Break LOCA occurred 4 hours ago
- A Recirculation Actuation Signal (RAS) has actuated

Which one of the following will ensure a PH of between 7.0 and 8.0 in the containment sump?

A. Chemical transformation within trisodium phosphate

B. Chemical transformation within trisodium sulfate

C. Chemical transformation within trisodium acetate

D. Chemical transformation within trisodium borate

Question: 78 Point Value: 1.00 LP#:2XB204 Item #:8412

Given the following:

- RCS pressure is 1486 PSIA
- Containment pressure is 5.7 PSIG
- Pressurizer level is 24%

Which one of the following actions must be taken to restore Spent Fuel Pool cooling?

A. Use the CIAS override pushbuttons and open the critical loop CCW valves.

B. Use the SIAS override pushbuttons and open the critical loop CCW valves.

C. Use the SIAS override pushbuttons to open the non-critical CCW loop valves.

D. Use the CIAS override pushbuttons to open the non-critical CCW loop valves.

Question: 79 Point Value: 1.00 LP#:2XCR03 Item #:8183

The unit is operating at 100% with COLSS backup computer OOS for maintenance. A COLSS limit is exceeded and the COLSS alarm come in.

Which one of the following conditions would be considered an existence of an Adverse Trend?

A. DNBR new value is greater than DNBR initial value
LPD new value is greater than LPD initial value

B. DNBR new value is greater than DNBR initial value
LPD new value is less than LPD initial value

C. DNBR new value is less than DNBR initial value
LPD new value is greater than LPD initial value

D. DNBR new value is less than DNBR initial value
LPD new value is less than LPD initial value

Question: 80 Point Value: 1.00 LP#:2XCR08 Item #:0110

Which one of the following statements best describes the result of placing any switch on the NI Safety Channel Drawer in an abnormal position?

A. Placing any test or calibrate switch in a position other than normal may defeat a required trip in the current mode.

B. Placing any test or calibrate switch in a position other than normal will cause a Low DNBR and High LPD trip in the affected channel.

C. Placing any test or calibrate switch in a position other than normal will cause all channels to be returned to normal.

D. Placing any test or calibrate switch in a position other than normal may cause a channel trip if a calibration potentiometer is improperly adjusted.

Question: 81 Point Value: 1.00 LP#:2XCR08 Item #:8295

Given the following:

- Unit 2 is in MODE 2 during a reactor startup
- Reactor power is 4.9 E-4%
- Both startup channels have just failed

Which one of the following describes the corrective action(s) to be taken?

A. Immediately insert all regulating group CEA's and take actions to restore at least one channel to operability.

B. Maintain current power level until at least one channel is restored to operability.

C. Commence a reactor shutdown per SO23-3-1.2, procedure for reactor shutdown.

D. Continue approach to criticality using safety channel power indication.

Question: 82 Point Value: 1.00 LP#:2XCR09 Item #:8211

Reactor Coolant System flow sensed from the steam generator delta P is used to trip the reactor.

Which one of the following events is this trip protecting the the reactor from?

A. Reactor Coolant pump high vibrations

B. Reactor Coolant pump sheared shaft

C. Reactor Coolant pump seized shaft

D. Reactor Coolant Pump loss CCW flow

Question: 83 Point Value: 1.00 LP#:2XCR09 Item #:8266

Given the following:

- Steam Generator Pressure 723 PSIA
- Reactor Coolant Pressure 1725 PSIA
- Containment Temperature 125 deg F.
- Containment Pressure 13.0 PSIG

Assume ALL ESFAS signals are actuated.

Which one of the following Engineered Safety Features Actuation Systems (ESFAS) signals was generated by Manual Actuation?

A. Main Steam Isolation Signal (MSIS).

B. Containment Cooling Actuation Signal (CCAS).

C. Safety Injection Actuation Signal (SIAS).

D. Containment Spray Actuation Signal (CSAS).

Question: 84 Point Value: 1.00 LP#:2XE110 Item #:2689

The purpose of the maintenance lockout feature of the Emergency Diesel Generator (EDG) is to block all:

Which one of the following completes the above statement?

A. auto start features of the EDG.

B. ESFAS starts of the EDG.

C. starts of the EDG.

D. Governor Control System critical starts.

Question: 85 Point Value: 1.00 LP#:2XEL04 Item #:7666

Which one of the following describes the reason to avoid 1E 120 VAC Inverter operation with a Cooling Fan Failure and/or High Temperature alarms in?

A. The vital bus and associated equipment may become degraded.

B. The life expectancy of the inverter is greatly reduced.

C. The inverter DC input breaker will trip.

D. The inverter AC output breaker will trip.

Question: 86 Point Value: 1.00 LP#:2XER06 Item #:8346

SO23-3-3.23 Diesel Generator Monthly Test precaution 4.5 states,

" If the D/G is operated at less than 30% generator load for 4 hours (cumulative), then the D/G should be run for 30 minutes at greater than 50% load.

Which one of the following is the basis for this precaution?

A. To prevent overheating of the generator stator and winding

B. To prevent oil buildup in the turbocharger

C. To prevent excessive vibration of the generator

D. To prevent oil buildup in the cylinders and exhaust stacks

Question: 87 Point Value: 1.00 LP#:2XER10 Item #:8190

To ensure an inverter has sufficient DC voltage to close the DC input breaker, the DC input breaker should not be closed until which one of the following conditions is met?

A. Precharge lamp is illuminated

B. Precharge lamp is extinquisted

C. Battery charger is in service

D. Battery is fully charged

Question: 88 Point Value: 1.00 LP#:2XF101 Item #:8409

Which one of the following rooms is protected from fire with a Halon system?

A. Control Room

B. Cable Spreading Room

C. Diesel Generator Rooms

D. Computer Room

Question: 89 Point Value: 1.00 LP#:2XFR01 Item #:4735

Firewater to containment will isolate on which of the following ESFAS signal(s):

A. SIAS and CPIS

B. CIAS and CPIS

C. CIAS and SIAS

D. SIAS and CRIS

Question: 90 Point Value: 1.00 LP#:2XIR02 Item #:4209

The following plant conditions exist:

- Pressurizer heater cutout switch is selected to "X" and "Y"
- Pressurizer level Channel "X" is controlling.
- Pressurizer level Channel "Y" has failed **LOW**

Which ONE of the following states the condition of the Pressurizer heaters, assuming they were all on prior to the Channel "Y" failure?

A. All heaters remain energized.

B. All Non-1E heaters de-energize while all 1E heaters remain energized.

C. All heaters de-energize.

D. All heaters de-energize EXCEPT Channel "X" 1E heaters.

Question: 91 Point Value: 1.00 LP#:2XIR02 Item #:8287

Which one of the following pressurizer pressures is the LOWEST pressure at which the proportional heaters will be full off?

Assuming Pressurizer pressure setpoint is 2240 PSIA.

A. 2250 psia

B. 2260 psia

C. 2270 psia

D. 2280 psia

Question: 92 Point Value: 1.00 LP#:2XIR05 Item #:7711

During a plant startup the BOP operator inadvertantly adjusts Steam Bypass Control System from 1000 PSI to 900 PSI.

Which one of the following is caused by this adjustment?

A. Increase in Main Feedwater Temperature

B. Decrease in Main Feedwater Temperature

C. Increase in Reactor Coolant Temperature

D. Decrease in Reactor Coolant Temperature

Question: 93 Point Value: 1.00 LP#:2XIR06 Item #:2781

Unit 2 is at 100% power with the status of FWCS as follows:

- FWCS # 1 is selected from "BOTH" to position "1" (i.e., LT-1105)

Subsequently, LT-1105 fails high and a HLO is generated on FWCS # 1.

In addition to the Main Feedwater Regulating valve closing, which ONE of the following statements best describes the FWCS # 1 system response to a HLO?

A. Bypass valve closes and the feed pump is controlled by the demand from the FWCS # 2.

B. Bypass valve goes to 50% position and the feed pump is controlled by the demand from the FWCS # 2.

C. Bypass valve goes to 50% position and the feed pump is at minimum speed.

D. Bypass valve closes and the feed pump is at minimum speed.

Question: 94 Point Value: 1.00 LP#:2XP207 Item #:8350

The reactor has tripped from 100% power. The following conditions exist in the Steam Generators.

	Level	Pressure
E088	10% (NR)	710 PSIA
E089	12% (NR)	750 PSIA

Which one of the following is how feedwater is being supplied to the steam generators?

A. AFW is only feeding E088

B. AFW is only feeding E089

C. Both E088 and E089 are being fed with AFW and MFW

D. Both E-088 and E-089 are being fed with MFW on RTO.

Question: 95 Point Value: 1.00 LP#:2XP207 Item #:2746

In the Auxiliary feedwater System, what is the purpose of having "cycling" relays in the EFAS actuation paths?

A. To allow EFAS to override MSIS.

B. To allow the operator to override EFAS.

C. To allow the operator to manually restore S/G level.

D. To allow control of S/G level with no operator action.

Question: 96 Point Value: 1.00 LP#:2XPR04 Item #:8193

Which one of the following steps is performed to prevent possible water hammer during starting of the first condensate pump?

A. Open condensate overboard system pressurization valve

B. Open condensate pump discharge MOV 35%

C. Open condensate pump discharge valve's bypass valve

D. Open condensate pump discharge vent valve

Question: 97 Point Value: 1.00 LP#:2XQ102 Item #:6737

What effect will a loss of Service Water have on the Salt Water Cooling Pumps?

A. The pumps will need to be secured due to a loss of bearing flushing water

B. The pumps automatically trip due to a loss of flushing water.

C. The pumps will supply their own bearing flushing water upon a loss of Service Water.

D. The pumps have a backup supply from the Turbine Plant Cooling Water System.

Question: 98 Point Value: 1.00 LP#:2XR203 Item #:2271

Unit 2 is at 100 % power. The Wide Range Gas Monitor, 2RE-7865 aligned to the Plant Vent Stack for normal power operation. Waste gas release is in progress.

An alarm 61A08, "Airborne Radiation Hi" is received. Concurrently, the Alert (Amber) LED associated with the Effluent Channel is lit at the RM-23 Communication Module (L-405).

Which one of the following best describes the automatic action(s) caused by the WRGM for the above set of conditions ?

A. Sample flow control shifts from Isokinetic flow control to manual flow control.

B. The monitor realigns to containment purge to sample that flow path.

C. The waste gas discharge flow control valve HV 7202 closes.

D. The outside containment mini & normal purge isolation valves close.

Question: 99 Point Value: 1.00 LP#:2XRL07 Item #:6496

During a large break Loss of Coolant Accident core uncovery occurred while sampling at the Post Accident Sample System.

Which one of the following will be an indication of high radiation in the post accident sample system area?

A. Isolated samples and coolers bypassed

B. Local alarm and isolated samples

C. Isolated samples only

D. Alarm in control room only

Question: 100 Point Value: 1.00 LP#:2XRR08 Item #:8194

Which one of the following radiation monitors will cause the initiation of the Containment Purge Isolation Signal (CPIS)?

A. RE-7828 Containment Purge Stack Rad monitor

B. RE-7804 Train "A" Containment Airborne Rad Monitor

C. RE-7820 In Containment High Range Rad Monitor

D. RE-7808 plant vent stack Rad Monitor

NRC EXAMINATION ANSWER KEY

1. C	26. C	51. B	76. C
2. B	27. B	52. B	77. A
3. C	28. C	53. D	78. D
4. A	29. B	54. C	79. C
5. D	30. D	55. A	80. B
6. B	31. D	56. C	81. D
7. A	32. B	57. B	82. B
8. A	33. A	58. D	83. D
9. B	34. A	59. C	84. C
10. C	35. C	60. D	85. B
11. D	36. D	61. A	86. D
12. C	37. A	62. B	87. A
13. D	38. D	63. A	88. D
14. C	39. B	64. B	89. C
15. B	40. C	65. A	90. D
16. C	41. A	66. C	91. C
17. A	42. B	67. D	92. D
18. C	43. B	68. C	93. A
19. A	44. B	69. B	94. B
20. C	45. D	70. A	95. D
21. A	46. B	71. D	96. B
22. D	47. B	72. B	97. C
23. B	48. B	73. D	98. C
24. C	49. A	74. B	99. B
25. D	50. D	75. A	100. B