APPENDIX A

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-313/94-01
50-368/94-01

Licenses: DPR-51
NPF-6

Licensee: Entergy Operations, Inc.
Route 3, Box 137G
Russellville, Arkansas

Facility Name: Arkansas Nuclear One, Units 1 and 2

Inspection At: Russellville, Arkansas

Inspection Conducted: March 1-11, 1994

Inspectors: S. L. Mr ry, Chief Examiner, Operations Branch
Divisio. .f Reactor Safety

Accompanying Personnel: E. Benjamin, Examiner, Contractor,
Battelle Pacific NW Labs

J. Nicholaus, Examiner, Contractor,
Battelle Pacific NW Labs

Approved: John Pellet
John L. Pellet, Chief, Operations Branch
Division of Reactor Safety

3/30/94
Date

Inspection Summary

Areas Inspected (Unit 1): Routine, announced inspection of the qualifications of applicants for operator licenses and of the continued proficiency of a currently licensed senior operator at the Arkansas Nuclear One, Unit 1, facility, which included an eligibility determination and administration of comprehensive written examinations and operating tests. The examination team also observed the performance of on-shift operators and plant conditions incident to the conduct of the applicant evaluations. The examiners used the guidance provided in NUREG-1021, "Operator Licensing Examiner Standards," Revision 7, Sections 201-203, 301-303, 401 403, and 601-605 issued January 1993.

Areas Inspected (Unit 2): No inspection of Unit 2 was performed.

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Results (Unit 1):

- All 11 reactor operator license applicants passed all portions of the examination and the senior reactor operator passed the requalification examination retake of the JPM portion of the operating examination (Section 1).

- The job performance measure (JPM) forms developed by the facility training department relied significantly on skill-of-the-craft of evaluators due to a lack of detail on the forms (Section 1.1).

- Grades on the written examination ranged from 83 to 93 percent with an average of 89 percent (Section 1.2).

- Facility personnel were not familiar with the process for escorting visitors into the controlled access area of the plant (Section 1.3.2).

Results (Unit 2): Not applicable.

Summary of Inspection Findings:

- There were no findings that were assigned a tracking number identified during the course of this inspection.

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Simulation Facility Report
- Attachment 3 - Written Examination Keys
- Attachment 4 - Facility Licensee Post Examination Comments

DETAILS

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

During the inspection, the team evaluated the qualifications of 11 reactor operator (RO) license applicants and the continued proficiency of one currently licensed senior reactor operator (SRO). The inspection assessed the eligibility and administrative and technical competency of the applicants to be issued licenses to operate the reactivity controls of a commercial nuclear power facility in accordance with 10 CFR Part 55 and NUREG-1021, "Operator License Examiner Standards," Revision 7, Sections 200 (series), 300 (series), and 400 (series). The SRO was evaluated for license renewal in accordance with 10 CFR Part 55 and Section 600 (series) of NUREG-1021. Further, the inspection included evaluations of facility materials, procedures, and simulation capability used to support development and administration of the examinations. These areas were evaluated using the guidance provided in the areas of NUREG-1021 cited above. Additionally, the examination team also observed the performance of onshift operators and plant conditions incident to the conduct of the applicant evaluations.

After completion of the evaluations, the team determined that all applicants for RO licenses satisfied the requirements of 10 CFR 55.33(a)(2) and have been issued the appropriate licenses. Further, the currently licensed SRO satisfied the requirements of 10 CFR 55.57 to permit license renewal at the expiration of the current license.

Performance results for individual applicants are not included in this report because inspection reports are placed in the NRC Public Document Room as a matter of course. Individual performance results are not subject to public disclosure.

1.1 Facility Materials Submitted for Examination Development

The chief examiner reviewed the licensee's materials provided for development of the examination, which included station administrative and operating procedures, lesson plans, question banks, simulator scenarios, and job performance measures (JPMs). The procedures and lesson plans were adequate. Some JPMs were not current with the latest procedure revision.

The facility bank of written questions, dynamic simulator scenarios, and JPMs was adequate in scope, depth, and variety. It was used extensively in developing the examinations. The JPMs often lacked sufficient detail to permit an examiner to evaluate performance without reference to the required procedure while observing a task. For example, one JPM task contained the following performance element: "Align Bus A-1 by putting listed feeder breakers in local control and open". There were several breakers on the list in the procedure which was not included on the JPM form. Therefore, proper evaluation required the evaluator to be thoroughly familiar with procedural requirements or to refer to a copy of the procedure during the evaluation.

The facility licensee was encouraged to ensure that adequate and consistent evaluations could be made with the low level of detail in many JPMs.

1.2 Written Examinations

The examination team developed a comprehensive written RO examination in accordance with the guidelines of NUREG-1021, Revision 7, Section 401. The examination consisted of 100 multiple choice questions. During the week of February 14, 1994, members of the facility operations and training departments, under the provisions of NUREG-1021, which require execution of a non-disclosure security agreement, reviewed the examinations at the Region IV office. The NRC considers the pre-administration review of the examination by the facility as part of the examination development process. Therefore, the specific comments resulting from that review are not reported or otherwise retained. The chief examiner incorporated the facility review comments and administered the examinations to the license applicants on March 1, 1994.

The chief examiner provided the facility training staff with a copy of the "as administered" written examination and answer key, along with the pre-administration review comments on March 1, 1993, immediately following the completion of the written examination by the applicants. The facility reviewed the as-administered examination and provided additional comments on Questions 11, 26, and 95, which are contained in Attachment 4.

Based on an analysis of the comments, supporting information supplied by the facility staff, and other material available to the chief examiner, the facility comments about Questions 11, 26, and 95 were found to be technically correct and the actions requested by the facility were in accord with NUREG-1021 and were reflected in the master examination and key in Attachment 3.

Overall, applicants performed well on the written examinations. Scores ranged from 83 to 93 percent with an average of 89 percent overall. All applicants passed the written examination.

The chief examiner reviewed applicant performance on individual questions and observed that the following questions were missed by 36 percent or more of the applicants responding to the question. The questions are referenced here only by question number. Refer to Attachment 3 for the complete question and answer:

004, 018, 026, 030, 032, 033, 070, 073*, 083, 086, 087*, 093*

*Missed by 72 percent or more of respondents.

The chief examiner concluded that no specific area of significant knowledge weakness was apparent in the responses to the above questions. Therefore, the information is provided to the facility training staff for consideration as feedback into future training needs.

1.3 Operating Tests

The team developed comprehensive operating tests in accordance with the guidelines of NUREG-1021, Revision 7, Section 301. The operating tests consisted of two parts, a dynamic simulator scenario portion and a control room/plant walkthrough portion. The chief examiner previewed and validated the various portions of the operating tests at the facility licensee's site during the week of February 28, 1994, with the assistance of facility training personnel under security agreement. The team administered the operating tests during the week of March 7, 1994.

1.3.1 Dynamic Simulator Scenarios

The team evaluated five crews (one consisting of three RO applicants rotating through two positions, and the remainder consisting of two RO applicants) on two or three scenarios (depending on crew composition) using the Arkansas Nuclear One, Unit 1, plant-specific simulation facility. Licensed senior operators performed as the control room supervisor on each crew, since there were no senior license applicants. The examiners compared applicants' actual performance during the scenarios with expected performance in accordance with the requirements of NUREG-1021, Revision 7, Section 303, to evaluate applicants' competency on this portion of the operating tests.

All applicants passed this portion of the operating tests.

1.3.2 Walkthrough Examinations

The examination team evaluated each of the RO applicants using 10 JPMs relating to tasks within the scope of potential duties of a licensed RO (which included nonlicensed operator tasks outside the control room). The examination team evaluated the currently licensed SRO on five RO or SRO tasks. The applicants and requalification examinee performed some of the tasks in the simulation facility in the dynamic mode. They simulated (through discussions) the remainder of the tasks in the plant integrated control room and at local operating stations throughout the plant. Immediately following the performance of each task, the examiners asked pre-scripted questions relating to the system involved in the task (for license applicants only). The questions solicited "short-answer" responses and permitted the applicants to use operationally controlled references to aid in their responses, unless specifically annotated to require response from memory. The examiners combined the applicants' task performance and question responses in accordance with the guidelines of NUREG-1021, Revision 7, Section 303, to evaluate performance on this portion of the operating examination. The examiners evaluated the performance of the requalification examinee in accordance with the guidelines of NUREG-1021, Revision 7, Section 603.

Overall, the applicants performed adequately. All applicants and the requalification examinee passed this portion of the operating examination with satisfactory overall performance on systems and tasks.

Each applicant was required to enter controlled access to complete one or more tasks. Applicants and other facility personnel were unfamiliar with facility escort procedures for entering controlled access with an escorted visitor. The facility licensee's procedure required that a member of the station security force act as a temporary escort for the visitor while the designated escort entered controlled access. The security guard was then supposed to unlock the turnstile with a hard key to permit the visitor to enter controlled access and return escort responsibility to the designated escort. Postings at the controlled access regarding visitor escort requirements were ambiguous, with respect to the procedural requirements. The postings conveyed the message that any facility individual qualified to escort visitors could act as the temporary escort and that the temporary escort could use his or her key card to permit the visitor to pass through the turnstile. In virtually every instance when members of the examination team were escorted into the controlled access area, the prescribed process was not followed either with respect to who may act as the temporary escort, how the turnstile was to be unlocked, or both. The resultant confusion and delays in admitting escorted examiners into controlled access areas contributed to a more stressful environment for the applicants than was necessary.

1.4 Simulator Fidelity

During the conduct of the operating tests, the examination team observed excessive flow rates through the intermediate cooling water (ICW) system relief valve inside the reactor building. (See Attachment 2 for details., This did not affect examination validity.

1.5 Conclusions

The examination team concluded that the performance of all 11 applicants for operator licenses and currently licensed SRO satisfied the requirements of 10 CFR 55.33(a)(2) and 10 CFR 55.57 respectively and recommended that licenses be issued or renewed as appropriate.

In general, the examination team concluded that:

- Individual applicants and crews performed satisfactorily.
- The JPM forms developed by the facility training department lacked detail and depended significantly on skill-of-the-craft of evaluators to assure adequate and consistent evaluations.
- Facility personnel were not familiar with the process for escorting visitors into the controlled access area of the plant.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

*B. Bement, Manager, Training and Emergency Preparedness
*R. Byford, Supervisor, Unit 1 Classroom Training
K. Canitz, Unit 1 Trainer
*R. Edington, Plant Manager Unit 2
S. Feemster, Unit 1 Trainer
*M. Goad, Unit 1 Trainer
*B. Heikes, Supervisor, Simulator Support
*R. Kibler, Unit 1 Operations Control Room Supervisor
*D. Sealock, Supervisor, Simulator Training
*J. Vandergrift, Plant Manager Unit 1
*R. Walters, Unit 1 Operations Control Room Supervisor
*C. Zimmerman, Manager, Unit 1 Operations

1.2 NRC Personnel

*S. McCrory, Chief Examiner, Operations Branch, Division of Reactor Safety, Region IV

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

*Denotes personnel that attended the exit meeting.

2 EXIT MEETING

An exit meeting was conducted on March 11, 1994. During this meeting, the chief examiner reviewed the scope and generic findings of the inspection. The chief examiner did not disclose preliminary results of individual evaluations since they are subject to change during the final review and approval process. The licensee did not identify as proprietary any information provided to, or reviewed by, the examiner. The licensee did not state any position on the findings presented during the exit meeting.

ATTACHMENT 2

SIMULATION FACILITY REPORT

Facility Licensee: Arkansas Nuclear One, Unit 1

Facility Docket: 50-313

Operating Tests Administered at: Arkansas Nuclear One, Unit 1

Operating Tests Administered on: March 7-11, 1994

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 which may be used in future evaluations. No licensee action is required in response to these observations.

During the dynamic operation of the simulator in support of the operating tests, the examination team observed excessive flow rates through the intermediate cooling water (ICW) system relief valve inside the reactor building.

The facility had obtained a new computer program for most of the plant systems. However, some systems and components were still modeled in the old program. The facility training staff had observed some problems when the old and new programs were required to interface. During one of the scenario sets, an intersystem LOCA was created from the letdown system through the ICW system. When the outboard containment isolation valve was shut the up stream ICW relief valve opened. Shortly after the relief valve opened leak rates in excess of 10E+6 gpm were observed. It was later determined that the relief valve was modeled in the old program and the RCS leak into the ICW in the new program.

Since the phenomenon occurred at the end of the planned scenario, it had no impact on the evaluations.

U. S. NUCLEAR REGULATORY COMMISSION
SITE SPECIFIC EXAMINATION
REACTOR OPERATOR LICENSE
REGION 4

CANDIDATE'S NAME: _____

FACILITY: Arkansas Nuclear One-1

REACTOR TYPE: PWR-B&W177

DATE ADMINISTERED: 94/02/28

INSTRUCTIONS TO CANDIDATE:

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. Points for each question are indicated in parentheses after the question. The passing grade requires a final grade of at least 80%. Examination papers will be picked up four (4) hours after the examination starts.

TEST VALUE	CANDIDATE'S SCORE	%	
100.00	_____	___ %	TOTALS
	FINAL GRADE		

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

_____
Candidate's Signature

QUESTION: 001 (1.00)

The following plant conditions exist.

- The plant is operating at 100% power.
- RCP C trips.

WHICH ONE (1) of the following temperature signals will the auto/manual transfer switch auto-select?

a. Unit T-ave.

b. Loop A-ave.

c. Loop B T-ave.

d. Flow compensated unit T-ave.

QUESTION: 002 (1.00)

WHICH ONE (1) of the following explains why the axial power shaping rods (APSR's) do not insert upon a reactor trip signal?

a. The lead screw is double pinned to the torque tube assembly preventing movement of the mechanism.

b. The power to the stator windings of the APSR mechanisms is not interrupted upon a trip signal.

c. The synchronizing bearing prevents the rotor assembly segment pivot arms from pivoting far enough to disengage the roller nuts.

d. The contact buttons on the bottom portion of the segment arms mechanically hold the APSR.

QUESTION: 003 (1.00)

The following plant conditions exist:

- Reactor power is 45%.
- Rod control is in automatic.

WHICH ONE (1) of the following conditions would result in an out inhibit being generated by the rod control logic?

a. High neutron error signal.

b. ICS in track.

c. One rod is 10 inches from its group average position.

d. Safety rod groups at the out limit.

QUESTION: 004 (1.00)

WHICH ONE (1) of the following MINIMUM power levels is the axial power imbalance limit in effect?

a. 15%.

b. 25%.

c. 35%.

d. 45%.

QUESTION: 005 (1.00)

WHICH ONE (1) of the following combinations of AC and DC breakers and electronic trips will remove all power from the control rod drive mechanisms?

a. A+C breakers open plus F electronic trip.

b. B+C breakers open plus E electronic trip.

c. B+D breakers open plus F electronic trip.

d. A+D breakers open plus E electronic trip.

QUESTION: 006 (1.00)

The pressurizer code safety valves are designed to prevent an RCS pressure in excess of 110% of design pressure.

WHICH ONE (1) of the following transients is the design basis for the code safety valves?

a. A complete load reject from 100% power without a reactor trip.

b. A control rod withdrawal accident from zero percent power.

c. A full high pressure injection actuation at normal operating pressure.

d. A loss of feed water at 100% power with the ERV failing to operate.

QUESTION: 007 (1.00)

WHICH ONE (1) of the following conditions must exist before starting an RCP, in accordance with 1102.002, "Plant Startup"?

a. OTSG temperature 50 degrees F greater than RCS temperature.

b. RCP seal leakoff collection tank drain pumps mode select switch in HAND position.

c. A steam bubble in the pressurizer.

d. Reactor coolant MU tank pressure greater than 30 psig.

QUESTION: 008 (1.00)

The following plant conditions exist.

- Startup from COLD SHUTDOWN in progress.
- A steam bubble has been formed in the pressurizer.
- Nitrogen is being vented from the pressurizer.

WHICH ONE (1) of the following indications demonstrates that nitrogen has been vented from the pressurizer?

a. Pressurizer pressure stops decreasing.

b. Quench tank pressure stops increasing.

c. Pressurizer spray causes a significant RCS pressure decrease.

d. Proportional pressurizer heaters can maintain a steady RCS pressure increase.

QUESTION: 009 (1.00)

WHICH ONE (1) of the following reactor trips is designed to protect the core from departure from nucleate boiling?

a. High reactor coolant pressure.

b. High reactor coolant temperature.

c. Overpower.

d. Loss of main feedwater.

QUESTION: 010 (1.00)

WHICH ONE (1) of the following describes the purpose for minimum bypass flow around the pressurizer level control valve, CV-1235?

a. To offset letdown flow.

b. To limit thermal shock to the downstream HPI nozzle.

c. To supply high pressure auxiliary spray to the pressurizer.

d. To assure sufficient flow to the RCP seals.

QUESTION: 011 (1.00)

WHICH ONE (1) of the following valves fails CLOSED on loss of instrument air?

a. Demineralizer bypass valve, MU-9.

b. Letdown orifice bypass valve, CV-1223.

c. Letdown orifice isolation valve, CV-1222.

d. Purification demineralizer inlet valve, CV-1245.

QUESTION: 012 (1.00)

The following plant conditions exist:

- Reactor power is 87%.
- Makeup Tank level is increasing.
- Boronometer indicates a decrease in boron concentration.

WHICH ONE (1) of the following actions is an immediate operator action in accordance with 1203.17, "Moderator Dilution"?

a. Open BWST outlet to MU pump valve CV-1407 or CV-1408.

b. Isolate letdown.

c. Isolate the inservice purification demineralizer.

d. Close pressurizer level control valve CV-1235.

QUESTION: 013 (1.00)

The following plant conditions exist.

- The plant is in COLD SHUTDOWN.
- RCS pressure is 250 psig.
- DHR suction valves CV-1050 and CV-1410 are open.
- The DHR system is in its normal decay heat removal lineup.

WHICH ONE (1) of the following actions will occur when RCS pressure increases to 355 psig?

a. CV-1050 and CV-1410 will remain open, and CV-1404 will auto-close.

b. CV-1050 will remain open and CV-1410 will auto-close.

c. CV-1410 will remain open and CV-1050 will auto-close.

d. CV-1410 and CV-1050 will auto-close.

QUESTION: 014 (1.00)

WHICH ONE (1) of the following RCS pressures is the approximate RCS pressure expected at the time of an automatic SIAS on RCS low pressure?

ESFS

a. 1750 psig.

b. 1525 psig.

c. 1320 psig.

d. 585 psig.

QUESTION: 015 (1.00)

The following plant conditions exists:

- One CFT has a high water level.
- Nitrogen pressure is NORMAL.

WHICH ONE (1) of the following describes the ability of the CFT to perform its designated safety function during a large break LOCA?

a. It will discharge an insufficient volume of water.

b. It will discharge excessive nitrogen into the core.

c. It will discharge its contents too late.

d. It will discharge its contents too soon.

QUESTION: 016 (1.00)

Operating Procedure 1102.002, "Plant Startup", has a caution against shutting down the DH system with no RCP's running.

WHICH ONE (1) of the following represents the reason for this caution?

a. The DH system is not yet isolated from the RCS.

b. DH pump operation is not throttled, causing pump cavitation and impeller damage.

c. NPSH limitations require that DH system pressure be above RCS pressure.

d. An uncontrolled heatup rate will result.

QUESTION: 017 (1.00)

A limit and precaution of Auxiliary System Operating Procedure 1104.028, "ICW System Operating Procedure", states that the ICW system must be placed in operation prior to exceeding 200 degrees F in the RCS.

WHICH ONE (1) of the following represents the reason for this precaution?

a. To prevent RCP seal damage.

b. To prevent purification demineralizer resin damage.

c. To prevent heatup of the quench tank.

d. To prevent control rod drive stator damage.

QUESTION: 018 (1.00)

WHICH ONE (1) of the following describes the status of the pressurizer ERV (PSV-1000) when the white indicating light above the operating switch is illuminated?

a. PSV-1000 is in the open position.

b. The PSV-1000 control solenoid is energized.

c. The ERV isolation valve is open.

d. The ERV selector switch allows auto operation.

QUESTION: 019 (1.00)

WHICH ONE (1) of the following RPS trips is bypassed when the RPS is in shutdown bypass?

a. High pressure.

b. High flux.

c. High temperature.

d. Variable pressure-temperature.

QUESTION: 020 (1.00)

The following plant conditions exist.

- A reactor startup is in progress.
- The reactor protection channels are in shutdown bypass.

WHICH ONE (1) of the following is the reason for the imposed reactor trip functions?

a. To protect against the consequences of a reactivity addition accident at low system pressure and temperature.

b. To protect against the consequences of a low pressure condition while shutdown.

c. To provide a backup to the reactor high temperature trip.

d. To provide a backup to the cocked rod protection provided by a safety rod group.

QUESTION: 021 (1.00)

Auxiliary System Operating Procedure 1104.036, "Emergency Diesel Generator Operation", cautions that diesel run time, unloaded or at low load, should be minimized. WHICH ONE (1) of the following is the basis for this caution?

a. To minimize engine wear and internal stresses.

b. To prevent a motoring trip.

c. To prevent carbon fouling.

d. To prevent excessive fuel build-up in the cylinders.

QUESTION: 022 (1.00)

A plant startup in accordance with Operating Procedure 1102.002, "Plant Startup", is in progress. The first RCP, P-32C, is about to be started.

WHICH ONE (1) of the following RCP conditions would prevent RCP P-32C from starting?

a. RCP motor lower bearing oil reservoir level of 9".

b. RCP motor ICW cooling flow of 100 gpm.

c. RCP seal injection flow of 6 gpm.

d. RCS wide range T-cold of 200 degrees F.

QUESTION: 023 (1.00)

WHICH ONE (1) of the following plant conditions will initiate an ESAS actuation?

a. RCS pressure of 1800 psia.

b. Containment pressure of 5 psig (19.7 psia).

c. BWST level of 10 feet.

d. Containment radiation levels three times normal background.

QUESTION: 024 (1.00)

WHICH ONE (1) of the following consequences will result when an ESAS analogue channel is de-energized.

a. The circuit is bypassed, and the trip logic becomes 1 out of 2.

b. The circuit is bypassed, and the trip logic becomes 1 out of 3.

c. The circuit is tripped, and the trip logic becomes 1 out of 2.

d. The circuit is tripped, and the trip logic becomes 1 out of 3.

QUESTION: 025 (1.00)

Plant conditions are as follows:

- A plant heat-up is in progress.
- RCS pressure is 300 psig.
- RCS temperature is 275 degrees F.

WHICH ONE (1) of the following ECCS components is REQUIRED by Technical Specifications to be operable?

a. TWO (2) reactor building spray pumps.

b. TWO (2) core flood tanks.

c. TWO (2) high pressure injection pumps.

d. TWO (2) service water pumps.

QUESTION: 026 (1.00)

WHICH ONE (1) of the following will trip an ESAS analog channel?

a. Placing the rotary switch on the pressure test module to "test operate".

b. Operating the toggle switch on a unit control module.

c. De-energizing the logic buffer trip relay.

d. Taking a pressure test module out of "operate".

QUESTION: 027 (1.00)

WHICH ONE (1) of the following individual rod positions is, when exceeded, associated with the asymmetric rod runback circuit?

a. NINE (9) inches from its API group average.

b. NINE (9) inches from its RPI group average.

c. SEVEN (7) inches from its API group average.

d. SEVEN (7) inches from its RPI group average.

QUESTION: 028 (1.00)

WHICH ONE (1) of the following power range nuclear instrument functions uses both the summation and the difference of the upper and lower neutron detector flux signals?

a. Reactor power/imbalance/flow trip.

b. Reactor high power trip.

c. Axial power distribution.

d. Power imbalance meters.

QUESTION: 029 (1.00)

The following plant condition exists.

- The reactor is at 100% power with ICS in full auto.
- Power is lost to the ICS.

WHICH ONE (1) of the following actions will result?

a. MFP's go to minimum speed.

b. Low-load and startup control valves close.

c. The diamond panel reverts to manual.

d. Reactor demand HA station goes to hand.

QUESTION: 030 (1.00)

WHICH ONE (1) of the following is used to calculate the subcooling margin displayed at panels C486 and C04?

a. The hottest RTD for that train and associated loop narrow range pressure.

b. The hottest RTD for that train and associated loop wide range pressure.

c. Average of the five hottest qualified CET's for that train and associated loop narrow range pressure.

d. Average of the five hottest qualified CET's for that train and associated loop wide range pressure.

QUESTION: 031 (1.00)

WHICH ONE (1) of the following is the status of the reactor building ventilation system fan and cooling units following the rupture of the common discharge header from main chilled water pumps VP1A and VP1B?

a. They will be inoperable in the NORMAL mode, but available for ESAS cooling when aligned to circulating water.

b. They will be inoperable in the ESAS mode, but available for normal cooling.

c. They will be inoperable in the NORMAL mode, but available for ESAS cooling.

d. They will be inoperable in both the NORMAL and ESAS modes.

QUESTION: 032 (1.00)

WHICH ONE (1) of the following is the power supply for reactor building cooling fan VSF-1C?

a. 4160v ES bus A1.

b. 4160v ES bus A2.

c. 480v ES bus B5.

d. 480v ES bus B6.

QUESTION: 033 (1.00)

An ICS turbine header pressure sensor fails, causing a plant transient.

WHICH ONE (1) of the following ICS control stations will terminate the transient when placed in hand?

a. Steam generator - reactor demand station.

b. Loop feedwater demand station (either).

c. Reactor demand station.

d. Turbine control station.

QUESTION: 034 (1.00)

WHICH ONE (1) of the following is the reason for interlocks in the RB purge exhaust air system?

a. To prevent supply fan operation without the exhaust fan operating.

b. To prevent damage to the containment purge valves.

c. To prevent operation without the cooling coils being energized.

d. To prevent the opening of the outlet damper.

QUESTION: 035 (1.00)

WHICH ONE (1) of the following actions describes the design operation of the main steam safety valves (MSSV's) following a main turbine trip?

a. MSSV's open sequentially, then close sequentially as pressure decreases.

b. MSSV's open sequentially, then close simultaneously when pressure decreases to approximately 1050 psig.

c. MSSV's open immediately, then close sequentially as pressure decreases.

d. MSSV's open immediately, then close simultaneously when pressure decreases to approximately 1050 psig.

QUESTION: 036 (1.00)

WHICH ONE (1) of the following conditions would INCREASE the margin to the loop BTU limit?

a. Decreasing selected T-hot.

b. Decreasing OTSG pressure.

c. Decreasing loop RCS flow.

d. Decreasing feedwater temperature.

QUESTION: 037 (1.00)

The following plant conditions exist.

- The reactor is operating 100% power.
- All systems are in their normal lineup.

WHICH ONE (1) of the following plant conditions would result, with no operator action, when the controlling RCS pressure instrument fails HIGH with no SASS transfer?

a. That channel will indicate high saturation margin.

b. The control rods will withdraw.

c. The ERV will open.

d. Makeup tank level will increase.

QUESTION: 038 (1.00)

Operating procedure 1106.016, "Condensate, Feedwater and Steam System Operation", cautions that, when a heater drain pump trips, the associated discharge valve should be closed as soon as possible.

WHICH ONE (1) of the following represents the reason for this precaution?

a. To maintain suction necessary for pump restart.

b. To prevent draining the moisture separator drain tank.

c. To prevent flooding the moisture separator drain tank.

d. To prevent pump damage caused by reverse flow.

QUESTION: 039 (1.00)

Operating Procedure 1102.002, "Plant Startup", requires an RO to verify the operability of both "OTSG per reactor coolant loops".

WHICH ONE (1) of the following plant conditions meets the requirement of an "operable OTSG per reactor coolant loop"?

a. An operable MSIV for that OTSG.

b. An operable RCP for that loop.

c. Associated start-up feedwater valve in manual.

d. EFW aligned for automatic operation.

QUESTION: 040 (1.00)

WHICH ONE (1) of the following plant conditions will cause the MSIV to close automatically?

a. Both MFP's tripped.

b. OTSG A at LOW LEVEL.

c. OTSG B at HI HI LEVEL.

d. OTSG A pressure of 550 psig.

QUESTION: 041 (1.00)

WHICH ONE (1) of the following signals is the source of the turbine bypass valve position demand signal with the ICS turbine bypass valve control in automatic?

a. Reactor power and feedwater flow.

b. Total feedwater flow demand and loop feedwater flow demand.

c. Turbine header pressure setpoint and turbine header pressure.

d. Turbine steam chest pressure upstream of the control valves and the turbine generator output.

QUESTION: 042 (1.00)

The plant is performing a turbine startup and the generator is being placed on the grid.

WHICH ONE (1) of the following is the point at which the turbine control system automatically shifts from speed control to load control?

a. Both generator output breakers are shut and generator load is greater than 50 MWe.

b. The turbine is at 1700 rpm, 1800 rpm has been selected and "GO" is pushed.

c. The turbine is at 1800 rpm and the generator field breaker is closed.

d. The turbine is at 1800 rpm and a main generator output breaker is closed.

QUESTION: 043 (1.00)

The following plant conditions exist.

- The reactor is stable at 85% power.
- ICS is in full auto.

WHICH ONE (1) of the following actions will ICS automatically initiate when MFP P1B trips?

a. Loop demand of zero is inserted at FW demand station; FW control station runs P1B speed demand signal to zero; P1B start-up and low-load control valves close.

b. Crosslimit is initiated; unit load demand goes into track; generated megawatt becomes unit load demand signal; rods insert to bring actual reactor power to within 5% of total adjusted FW flow.

c. Crosslimit is initiated; unit load demand goes into track; runback to 40 % reactor power at 50%/minute occurs; crossconnect valve opens; OTSG levels controlled by startup and low load control valves.

d. Unit load demand initiates runback to 75% reactor power at 50%/minute; runback clears when output of the rate and load limiter reduces the demand signal to less than 45%.

QUESTION: 044 (1.00)

WHICH ONE (1) of the following power sources provides the motive force for the EFW flow control valves?

a. Service air.

b. Essential AC power.

c. Essential DC power.

d. Instrument air.

QUESTION: 045 (1.00)

WHICH ONE (1) of the following power supplies is the normal source for RPS channel D?

a. Inverter Y22 from MCC-B61.

b. Inverter Y22 from D01.

c. Inverter Y24 from MCC-B61

d. Inverter Y24 from D01.

QUESTION: 046 (1.00)

WHICH ONE (1) of the following conditions will prevent a fast (synch check) transfer of A1 to SU1 following a reactor trip from 100% power?

a. Local handswitch for breaker A113 (SU-1 to A1 bkr) selected to remote.

b. 186-A1 (A1 bus lockout relay) reset.

c. C-10 handswitch for breaker A113 in pull-to-lock.

d. A112 (unit auxiliary breaker to A1) closed.

QUESTION: 047 (1.00)

WHICH ONE (1) of the following operating parameters will trip an operating diesel generator from a normal start?

a. Lube oil pressure of 19 psig.

b. EDG lockout relay energized.

c. Positive crankcase pressure of 1 psia.

d. Engine speed of 880 rpm.

QUESTION: 048 (1.00)

WHICH ONE (1) of the following radiation monitors, when in high alarm, has an automatic action associated with it?

a. Failed fuel monitor RE-1237.

b. Intermediate cooling water monitor RE-2237.

c. Liquid radwaste monitor RE-4642.

d. Stack gas monitor RE-7400.

QUESTION: 049 (1.00)

The High Range In-Containment Radiation Monitors normally read about 1R/Hr. WHICH ONE (1) of the following is the reason for this reading?

a. They are located in areas of the Reactor Building where the dose rates are that high.

b. The U-234 used in the ionization chamber supplies a self check signal.

c. An electronic signal that checks the circuitry applies a "dummy" 1R/Hr signal.

d. A Cs-137 check source is constantly exposed.

QUESTION: 050 (1.00)

The following plant conditions exist:

- The plant is in COLD SHUTDOWN.
- DH loop A is in service.
- A loss of offsite power occurs.
- BOTH EDG's start and load onto their respective busses.
- SW pump P4A fails to start, and all attempts to start it fail.

WHICH ONE (1) of the following operator actions should be performed for these conditions?

a. Lineup and start DH loop B.

b. Throttle LPI block valve CV-1401.

c. Start HPI pump B.

d. Unload and stop EDG 2.

QUESTION: 051 (1.00)

The following plant conditions exist.

- The plant is operating at 100% power with ICS in full auto.
- SASS selector switch for neutron flux is selected to NNIX.
- Power range nuclear instrument NI6 fails high.
- No operator action is taken.

WHICH ONE (1) of the following reactions describes the plant response?

a. Rods are inserted until ICS goes to track, feedwater flow increases, and the reactor trips on high power.

b. ICS goes to track, rods are inserted continuously, feedwater flow increases, and the reactor trips on low pressure.

c. Rods are inserted until ICS goes to track, feedwater flow decreases, and the reactor trips on high power.

d. ICS goes to track, rods are inserted continuously, feedwater flow decreases, and the reactor trips on low pressure.

QUESTION: 052 (1.00)

The following plant conditions exist.

- The plant is at 100% reactor power; ICS is in full auto.
- Control rod 4-7 drops.
- All systems work as designed, and there is no operator action.

WHICH ONE (1) of the following power levels will be the final MAXIMUM level, and at what rate?

a. 40%, at 30%/minute.

b. 40%, at 50%/minute.

c. 45%, at 30%/minute.

d. 45%, at 50%/minute.

QUESTION: 053 (1.00)

WHICH ONE (1) of the following is the reason that any rod suspected of being mechanically bound must be operated in run speed?

a. Run speed keeps stator current less than six amps per phase.

b. Run speed reduces the amount of torque applied to the mechanism.

c. Run speed ensures the stator temperature limit is not exceeded.

d. Run speed forces the foreign material from the CRDM.

QUESTION: 054 (1.00)

WHICH ONE (1) of the following responses is an automatic action that occurs as a result of a reactor trip from 100% power?

a. Makeup valves CV-1233/1234 open.

b. Feedwater flow decreases.

c. Unit demand goes to zero at 50%/minute.

d. Main turbine control goes to Operator-Auto.

QUESTION: 055 (1.00)

WHICH ONE (1) of the following plant parameters is the highest operator priority immediately following a valid reactor trip signal?

a. Primary inventory control.

b. Reactivity control.

c. Secondary inventory control.

d. Electrical load control.

QUESTION: 056 (1.00)

The following plant conditions exist.

- The plant is at 100% power.
- An ESAS channels 1 and 2 actuation occurs.

WHICH ONE (1) of the following valves will be OPEN, following ESAS actuation?

a. CV-3820, SW to ICW cooler supply.

b. CV-1219, HPI injection isolation valve.

c. CV-1433, DHR cooler outlet bypass valve.

d. CV-1234, makeup isolation valve.

QUESTION: 057 (1.00)

WHICH ONE (1) of the following plant conditions would require initiation of HPI cooling in accordance with Emergency Operating Procedure 1202.004, "Overheating"?

a. Pressurizer level cannot be maintained greater than 40 inches.

b. RCS pressure is 2375 psig and all feedwater is lost.

c. RCS subcooling is 0 degrees F.

d. Hot leg temperatures are 620 degrees F.

QUESTION: 058 (1.00)

The following plant conditions exist.

- The reactor is at 100% power.
- RCP SEAL INJ FLOW LO is in alarm.
- Seal injection flow control valve CV-1206 is closed.
- The OP HPI pump is operating.

WHICH ONE (1) of the following operator actions must be performed?

a. Manually defeat the RCP seal injection low flow interlock.

b. Manually close seal return valves CV-1270, CV-1271, CV-1272, and CV-1273.

c. Close seal injection flow control valve CV-1207, open CV-1206, then CV-1207 and place in auto.

d. Trip the OP HPI pump.

QUESTION: 059 (1.00)

The following plant conditions exist.

- The plant is in COLD SHUTDOWN.
- The RCS is drained to 374 feet.
- Loop A DH system is in operation.
- DECAY HEAT FLOW HI/LO is in alarm.
- RCS LEVEL LO is in alarm.

WHICH ONE (1) of the following portions of Abnormal Operating Procedure 1203.028, "Loss of Decay Heat Removal", should be performed?

a. Loss of SW flow.

b. Loss of Inventory.

c. Loss of DH pump.

d. Loss of DH flow.

QUESTION: 060 (1.00)

WHICH ONE (1) of the following times is the maximum that a reactor coolant pump is allowed to operate, in accordance with RCS Operating Procedure 1103.006, "Reactor Coolant Pump Operation", following the simultaneous loss of seal injection and seal cooling flow?

a. One minute.

b. Two minutes.

c. Five minutes.

d. Ten minutes.

QUESTION: 061 (1.00)

The following plant conditions exist:

- The plant is operating at 90% power.
- All SASS selector switches are in auto.
- The controlling RCS pressure output signal, PT-1021, slowly fails high.
- All automatic actions occur.

WHICH ONE (1) of the following operator actions is required?

a. Close the pressurizer ERV isolation valve.

b. De-energize the pressurizer heaters.

c. Open the pressurizer spray block valve.

d. Open the pressurizer spray valve.

QUESTION: 062 (1.00)

The following plant conditions exist.

- The reactor has tripped.
- Four control rods are stuck out.
- Emergency boration in accordance with 1202.012, "Repetitive Tasks", has been initiated.

WHICH ONE (1) of the following conditions will allow termination of boration?

a. RCS boron concentration is 1850 ppm.

b. Shutdown margin has been calculated to be 1.5%.

c. Source range counts on all channels are less than 100 cps.

d. Three of the stuck rods have been fully inserted.

QUESTION: 063 (1.00)

The following plant conditions exist.

- The plant is at 100% power.
- Pressurizer level is slowly decreasing.
- Indicated makeup and RCP [illegible] injection flow is zero.
- HPI pump discharge pressu[illegible] erratic, and control valves are stable.

WHICH ONE (1) of the following describes the IMMEDIATE ACTIONS required to be taken in response to these conditions?

a. Verify standby HPI pump starts, clo[illegible] makeup line isolation valve CV-1234.

b. Verify standby HPI pump starts, open letdown heat exchanger outlet valves CV-1214 and CV-1216.

c. Trip running HPI pump, close letdown isolation valve CV-1221.

d. Trip running HPI pump, close makeup line isolation valve CV-1234.

QUESTION: 064 (1.00)

The following plant conditions exist.

- A blackout is in progress.
- All RCP's are off, and reflux boiling is selected.

WHICH ONE (1) of the following reasons explains why OTSG fill rates must be controlled?

a. To prevent adding positive reactivity to the core.

b. To prevent blocking steam flow through the atmospheric dumps.

c. To prevent excessive OTSG tube to shell stress.

d. To prevent excessive RCS cooldown.

QUESTION: 065 (1.00)

The following plant conditions exist:

- A reactor startup is in progress.
- Reactor power is 1E-6 amps.
- Source range channel NI-1 has failed low.
- On-scale indication of neutron flux is available.

WHICH ONE (1) of the following actions must be taken?

a. Restore NI-1 prior to exceeding 1E+5 cps.

b. Restore NI-1 prior to exceeding 1E-2 amps.

c. Continue with reactor startup, and begin continuous monitoring of NI-1.

d. Trip the reactor.

QUESTION: 066 (1.00)

The following plant conditions exist.

- A reactor startup is in progress.
- Reactor power is 1E-6 amps.
- Intermediate range channel NI-3 has failed low.
- On-scale indication of neutron flux is available.

WHICH ONE (1) of the following actions is required to be taken?

a. Restore NI-3 prior to exceeding 2% power.

b. Restore NI-3 prior to exceeding 5% power.

c. Continue with reactor startup.

d. Trip the reactor.

QUESTION: 067 (1.00)

Plant conditions are as follows:

- Manual reactor trip has taken place, and immediate actions are complete.
- OTSG B level is increasing above 390".
- OTSG B pressure is decreasing below 900 psig rapidly.
- Pressurizer pressure and level are decreasing.
- Steam line high range radiation monitor RI-2682 is in alarm.

WHICH ONE (1) of the following events is in progress?

a. OTSG tube rupture and stuck open MSSV.

b. OTSG tube rupture and excessive EFW flow.

c. Small break LOCA and excessive EFW flow.

d. Small break LOCA and stuck open ERV.

QUESTION: 068 (1.00)

The following plant conditions exist.

- The plant has tripped from 100% power.
- An OTSG tube rupture has occurred.

WHICH ONE (1) of the following reasons is why the ruptured OTSG is steamed as necessary during the subsequent cooldown, in accordance with Emergency Operating Procedure 1202.006, "Tube Rupture"?

a. To maintain RCS pressure less than 1000 psig.

b. To maintain RCS temperature less than 500 degrees F.

c. To prevent Steam Generator level >390 inches.

d. To prevent the use of the turbine bypass valves.

QUESTION: 069 (1.00)

Plant conditions are as follows:

- OTSG B has a tube rupture and is unisolated.
- A natural circulation cooldown has resulted in the formation of voids in the RCS.

Emergency Operating Procedure 1202.006, "Tube Rupture", directs the operator to cycle the ERV.

WHICH ONE (1) of the following plant responses is the reason for cycling the ERV?

a. To vent any non-condensable gases from the RCS.

b. To maximize RCS leakage to a recoverable location.

c. To increase the RCS cooldown rate.

d. To control RCS pressure.

QUESTION: 070 (1.00)

The following plant conditions exist:

- The plant has tripped from 100% power.
- All RCP's are tripped.
- All MFP's are tripped.
- EFW is in service.
- OTSG A is at 800 psig and dropping.
- OTSG B is at 1000 psig.

WHICH ONE (1) of the following actions concerning EFW should be taken?

a. Isolate OTSG A to EFW P7A.

b. Restore MFW and secure EFW.

c. Run EFW until OTSG B level is above 60 inches.

d. Run EFW until OTSG B level is above 12 inches.

QUESTION: 071 (1.00)

The following plant conditions exist.

- The reactor has tripped.
- RCS cooldown rate is 120 degrees F per hour.
- HPI is on.

WHICH ONE (1) of the following plant conditions would invoke pressurized thermal shock limits to the reactor vessel?

a. RCP's off; CET's at 450 degrees F.

b. RCP's on; CET's at 550 degrees F.

c. RCP's on; RCS T-cold at 450 degrees F.

d. RCP's off; RCS T-cold at 550 degrees F.

QUESTION: 072 (1.00)

WHICH ONE (1) of the following operating parameters would provide the first indication of a loss of main feedwater, in accordance with 1203.27, "Loss of Steam Generator Feed"?

a. RCS pressure.

b. Main steam header pressure.

c. Reactor power.

d. Hot leg temperature.

QUESTION: 073 (1.00)

WHICH ONE (1) of the following is the reason why RCP operation should be limited when RCS pressure is below 400 psig?

a. It causes excessive thrust bearing wear due to abnormal pump loading.

b. It places the pump motor close to its maximum allowed amperage limit.

c. It results in improper pump sealing due to inadequate seal differential pressure.

d. It results in seal overheating due to reduced seal injection flow rates.

QUESTION: 074 (1.00)

The following plant conditions exist:

- A loss of offsite power has occurred.
- All expected automatic actions have occurred.
- Subcooling margin is 25 degrees F.

WHICH ONE (1) of the following plant conditions confirms that natural circulation flow has been established?

a. T-hot and associated OTSG T-sat are coupled and tracking.

b. There is a 70 degrees F difference between T-hot and T-cold.

c. CET temperatures and T-hot are coupled.

d. T-hot, T-cold and incore temperatures do not change when OTSG pressure is changed.

QUESTION: 075 (1.00)

The following plant conditions exist.

- A loss of offsite power has occurred.
- A3 and A4 are cross-connected.
- DG1 is available.

While in the process of restoring busses to normal, using Electrical System Operating Procedure 1107.002, "ES Electrical System Operation", the operator is cautioned that parallel operation of DG's is undesirable.

WHICH ONE (1) of the following plant responses is the reason for this caution?

a. A3-A4 tie breakers will not auto-open.

b. Backfeed of non-ES busses cannot be prevented.

c. Bus overload may result, causing the loss of a bus.

d. Governor and voltage control become unstable.

QUESTION: 076 (1.00)

WHICH ONE (1) of the following temperatures is the MAXIMUM at which a CET output is considered valid?

a. 3200 degrees F.

b. 2300 degrees F.

c. 1400 degrees F.

d. 1200 degrees F.

QUESTION: 077 (1.00)

The plant is operating at 50% power, when high activity is detected in the gaseous radioactive waste (GRW) discharge.

WHICH ONE (1) of the following describes the gaseous radioactive system response?

a. The GRW discharge is directed to the auxiliary building vent header (ABVH).

b. The GRW discharge is directed to the reactor building vent header (RBVH).

c. The GRW discharge header is isolated, and the ABVH discharge is directed to the waste gas surge tank.

d. The GRW discharge header is isolated, and the RBVH discharge is directed to the waste gas surge tank.

QUESTION: 078 (1.00)

The following plant conditions exist.

- Power operations.
- Instrument air pressure is decreasing.

WHICH ONE (1) of the following decreasing instrument air header pressures is the highest that requires a reactor trip, in accordance with Abnormal Operating Procedure 1203.024, "Loss of Instrument Air"?

a. 60 psig.

b. 45 psig.

c. 35 psig.

d. 25 psig.

QUESTION: 079 (1.00)

When EFIC is initiated, OTSG pressure is used to determine the OTSG fill rate, which varies between 2" per minute and 8" per minute.

WHICH ONE (1) of the following describes why the OTSG fill rate is varied in proportion to OTSG pressure when EFIC is initiated?

a. To assist the EFIC overfill logic in controlling OTSG level.

b. To maintain steam pressures above a predetermined value.

c. To minimize RCS cooldown during EFIC operation.

d. To prevent excessive thermal shock to the OTSG tubes.

QUESTION: 080 (1.00)

WHICH ONE (1) of the following conditions requires an immediate control room evacuation, in accordance with Abnormal Operating Procedure 1203.002, "Alternate Shutdown"?

a. A fire in the cable spread room threatens cable damage.

b. A fire in the ICS relay room threatens ICS function.

c. A fire in the Unit 1 computer room threatens equipment damage.

d. A fire in Unit 2 control room threatens vital controls.

QUESTION: 081 (1.00)

The following plant conditions exist.

- The plant is operating at 100% power.
- A control room fire causes an immediate control room evacuation.

As part of the follow-up actions to Abnormal Procedure 1203.002, "Alternate Shutdown", an operator is directed to manually align one train for HPI cooling. The operator is cautioned to listen for throttling noise and vibration while opening BWST outlet valve CV-1407.

WHICH ONE (1) of the following represents the reason this caution?

a. There is no recirculation path, so care must be taken to avoid pump damage.

b. The BWST may drain to the RB sump.

c. To avoid cavitation and other valve damage.

d. To prevent gas binding of the HPI pumps.

QUESTION: 082 (1.00)

Abnormal Operating Procedure 1203.029, "Remote Shutdown", is being implemented.

WHICH ONE (1) of the following plant responses is the reason for concern when performing local start of auxiliary feedwater pump P-75?

a. Feedwater crossconnect valve CV-2827 will auto-close.

b. MFP's A and B will trip.

c. MFW block and low-load block valves will auto-close.

d. P-75 start interlocks are bypassed.

QUESTION: 083 (1.00)

WHICH ONE (1) of the following conditions must exist before the operator may open the atmospheric dump control valves to control OTSG pressure when inadequate core cooling conditions exist?

a. Instrument air is not available.

b. OTSG pressures are less than 100 psig.

c. Emergency feed pump P-7B is the only source of feed.

d. Primary to secondary heat transfer is established.

QUESTION: 084 (1.00)

WHICH ONE (1) of the following actions is the method used to remove hot leg voids that are due to the presence of non-condensable gasses?

a. Hot leg venting.

b. RCP bumping.

c. RCP restarting.

d. RCS repressurizing.

QUESTION: 085 (1.00)

The following plant conditions exist:

- The reactor is tripped.
- Adequate subcooling margin does not exist.
- RCP's are tripped.
- EFW is supplying both OTSG's.
- OTSG levels are 100 inches.
- Primary to secondary heat transfer is not in progress.

WHICH ONE (1) of the following methods may be used to regain heat transfer via an OTSG?

a. Open the ERV and reduce RCS pressure until it is 40 degrees F to 60 degrees F below OTSG T-sat.

b. Reduce OTSG levels to 25 to 35 inches.

c. Lower OTSG pressure until primary to secondary temperature differential is 40 degrees F to 60 degrees F.

d. Bump an RCP in the loop with the lowest OTSG level.

QUESTION: 086 (1.00)

WHICH ONE (1) of the following is the reason for limiting the RCS cooldown rate during an HPI cooldown?

a. Voiding of the reactor vessel head.

b. Water hammer in the EFW lines.

c. Thermal stresses in the OTSG.

d. Brittle fracture of the RCS loop welds.

QUESTION: 087 (1.00)

WHICH ONE (1) of the following conditions requires entry into Emergency Operating Procedure 1202.004, "Overheating", when a SCM of 25 degrees exists?

a. All RCP's off; CET temperatures of 580 degrees F.

b. All RCP's off; CET temperatures of 600 degrees F.

c. One RCP on; CET temperatures of 580 degrees F.

d. One RCP on; CET temperatures of 600 degrees F.

QUESTION: 088 (1.00)

WHICH ONE (1) of the following dose rates represents the threshold value for a high radiation area?

a. 2.5 mR/hr.

b. 30 mR/hr.

c. 100 mR/hr.

d. 1000 mR/hr.

QUESTION: 089 (1.00)

WHICH ONE (1) of the following breathing apparatuses is approved for use in areas suspected to be oxygen deficient?

a. MSA pressure demand air line respirator.

b. 3M high efficiency respirator.

c. Self contained breathing apparatus.

d. MSA powered air-purifying respirator.

QUESTION: 090 (1.00)

Maintenance is to be performed on a steam system that cannot be completely drained. WHICH ONE (1) of the following states when maintenance of that system may proceed?

a. After the system has been isolated, and allowed to cool to near ambient temperature conditions.

b. After Hold Cards are used to tag isolation valves (all valves except manually closed motor-operated valves require Hold Cards).

c. After air-operated valves used as an isolation boundary are spring activated to the isolation position, regardless of its failure mode.

d. After a licensed operator has determined and verified the adequacy of the isolation boundary.

QUESTION: 091 (1.00)

WHICH ONE (1) of the following describes proper operation of motor operated disconnect (MOD) A6 (SW pump P4B) and A8 (HPI pump P36B).

a. Used to start and stop the pumps.

b. Both may be closed during bus power source switching.

c. Operated from control room panels C16 and C18.

d. A3/A4 breaker must be open prior to operating the MOD.

QUESTION: 092 (1.00)

WHICH ONE (1) of the following describes the term "bumping the RCP's"?

a. To run a pump for about 10 seconds from the time the pump switch is placed in the start position.

b. To run a pump for about 20 seconds from the time the pump motor reaches normal running current.

c. To run a pump for about 10 seconds from the time the pump motor reaches normal running current.

d. To run a pump for about 20 seconds from the time the pump switch is placed in the start position.

QUESTION: 093 (1.00)

WHICH ONE (1) of the following is an acceptable method of performing verification and independent verification of a safety-related Category E MOV that is covered by an approved procedure that contains steps that require sign-off and independent verification, according to Operations Administration Procedure 1015.001, "Conduct of Operations"?

a. A qualified operator initially verifies position indication by using remote indication, and during that same shift a qualified operator independently verifies position locally, including lock and chain integrity.

b. A qualified operator initially verifies position indication by using valve stem position, and during the next shift a qualified operator independently verifies position by remote indication.

c. A qualified operator initially verifies position indication by using remote indication, and during the next shift a qualified operator independently verifies position by remote indication.

d. A qualified operator initially verifies position indication by using valve stem position, including lock and chain integrity, and during that same shift a qualified operator independently verifies valve stem position locally.

QUESTION: 094 (1.00)

WHICH ONE (1) of the following individuals is NOT permitted to operate reactor controls under the instruction or supervision of a licensed operator?

a. An unlicensed shift engineer/shift technical advisor.

b. A reactor operator whose license has become inactive per the requirements of 10CFR55.

c. A licensed reactor operator who recently failed an NRC administered reactor operator requalification examination.

d. An individual enrolled in a current license training course to obtain an instructor certification.

QUESTION: 095 (1.00)

WHICH ONE (1) of the following operators has exceeded overtime limits as established in Operations Administrative Procedure 1015.001, "Conduct of Operation"?

a. Operator A works 12 on shift and 5 hours in remedial training in a 24 hour period.

b. Operator B works two 12 hour shifts in a 48 hour period.

c. Operator C works four 12 hour shifts and three 8 hour shifts during his week on mid shift.

d. Operator D works holds over for 4 hours all 5 days of his day shift.

QUESTION: 096 (1.00)

WHICH ONE (1) of the following plant conditions or events is REQUIRED to be entered in the control room log by the licensed operator?

a. Makeup acid feed pump P-72B is OOS.

b. Condensate storage tank level of 201,000 gallons

c. The return to service of a breathing air compressor motor.

d. The turbine generator has been tied to the grid.

QUESTION: 097 (1.00)

WHICH ONE (1) of the following plant conditions would require the operator to initiate a manual reactor trip?

a. An OTSG tube rupture larger than MAXIMUM MU flow with letdown in service.

b. Pressurizer level increasing from 90 inches.

c. An ESAS channel 1 actuation while in STARTUP.

d. Two RCP's in operation while at 60% power.

QUESTION: 098 (1.00)

The following plant conditions exist.

- A reactor trip occurs from 100% power.
- The control board operators begin to perform the immediate actions of 1202.001, "Reactor Trip".
- All 4160v busses become de-energized.

WHICH ONE (1) of the following operator actions should be taken when all 4160v busses become de-energized?

a. Immediately transition to 1202.008, "Blackout".

b. Complete the immediate actions of 1202.001, then transition to 1202.008, "Blackout".

c. Immediately transition to 1202.007, "Degraded Power".

d. Complete the immediate actions of 1202.001, then transition to 1202.007, "Degraded Power".

QUESTION: 099 (1.00)

WHICH ONE (1) of the following personnel is authorized to perform the independent verification of a temporary modification?

a. Any plant supervisor.

b. Any craftsman on the affected unit.

c. Any cognizant engineer.

d. Any operator.

QUESTION: 100 (1.00)

WHICH ONE (1) of the following actions is required immediately, in accordance with
Radiation Protection Administration Procedure 1012.017, "Radiological Posting and Entry/Exit Requirements", when an individual discovers a locked high radiation door open and unattended?

a. Initiate a condition report per Administrative Procedure 1000.014, "Condition reporting and Corrective Action".

b. Re-lock and re-seal door, and inform an HP technician.

c. Inform HP supervision, and remain in the area until relieved.

d. Annotate Form 1012.17B, "Daily LHRA Door Inspection".

(********** END OF EXAMINATION **********)

ANSWER: 001 (1.00)

c. [+1.0]

REFERENCE:

STM 1-64 R2, p. 22.
STM 1-69 R1, pp. 5, 7-8, 24.
001000A101 (3.8/4.2)

001000A101 ..(KA's)

ANSWER: 002 (1.00)

d. [+1.0]

REFERENCE:

STM 1-02 R3, p. 2.
001010K103 (3.4/3.6)

001010K103 ..(KA's)

ANSWER: 003 (1.00)

c. [+1.0]

REFERENCE:

STM 1-02 R3, p. 13.
014000K405 (3.1/3.3)

014000K405 ..(KA's)

ANSWER: 004 (1.00)

d. [+1.0]

REFERENCE:

1102.004 R30. p. 4.
015000A105 (3.7/3.9)

015000A105 ..(KA's)

ANSWER: 005 (1.00)

b. [+1.0]

REFERENCE:

STM 1-02 R3, p. 20
001000K202 (3.6/3.7)

001000K202 ..(KA's)

ANSWER: 006 (1.00)

b. [+1.0]

REFERENCE:

AA51002-001 R6, p. 12.
Technical Specifications A 94, p. 17.
002000G006 (2.6/3.8)

002000G006 ..(KA's)

ANSWER: 007 (1.00)

c. [+1.0]

REFERENCE:

1102.002 R39, p. 30.
1103.006 R13, p. 6-8.
1103.007 R3, p. 5.
002000K113 (4.1/4.2)

002000K113 ..(KA's)

ANSWER: 008 (1.00)

b. [+1.0]

REFERENCE:

1102.002 R55, p. 8. 1103.002 R19, p. 25.
004020K507 (3.0/3.4)

004020K507 ..(KA's)

ANSWER: 009 (1.00)

c. [+1.0]

REFERENCE:

STM 1-63 R2, pp. 2-3, 9.
015000K101 (4.1/4.2)

015000K101 ..(KA's)

ANSWER: 010 (1.00)

b. [+1.0]

REFERENCE:

STM 1-04 R3, p. 14.
AA51002-003 R5, p.32.
004000K511 (3.6/3.9)

004000K511 ..(KA's)

ANSWER: 011 (1.00)

b or d. [+1.0]

REFERENCE:

STM 1-04 R3, pp. 6, 8, 14-15.
1203.024 R7, pp. 15-16.
078000K302 (3.4/3.6)

078000K302 ..(KA's)

ANSWER: 012 (1.00)

d. [+1.0]

REFERENCE:

1203.17 R24, p. 2.
1202.01 R24, p. 18.
004000A206 (4.2/4.3)

004000A206 ..(KA's)

ANSWER: 013 (1.00)

c. [+1.0]

REFERENCE:

STM 1-05 R3, pp. 14-15.
1104.004 R55, pp. 7, 9-10, 15, 18.
005000K407 (3.2/3.5)

005000K407 ..(KA's)

ANSWER: 014 (1.00)

b. [+1.0]

REFERENCE:

1104.002 R44, p. 25.
006000K103 (4.2/4.3)

006000K103 ..(KA's)

ANSWER: 015 (1.00)

a. [+1.0]

REFERENCE:

STM 1-06 R2, pp. 2.
006000K502 (2.8/2.9)

006000K502 ..(KA's)

ANSWER: 016 (1.00)

d. [+1.0]

REFERENCE:

1102.002 R55, p. 30.
005000G010 (3.3/3.5)

005000G010 ..(KA's)

ANSWER: 017 (1.00)

d. [+1.0]

REFERENCE:

STM 1-43 R1, p. 10-12.
1104.028 R17, p. 5.
1105.009 R11, p. 12.
008000G010 (3.1/3.2)

008000G010 ..(KA's)

ANSWER: 018 (1.00)

d. [+1.0]

REFERENCE:

STM 1-03 R4, p.5-6.
010000G009 (3.6/3.5)

010000G009 ..(KA's)

ANSWER: 019 (1.00)

d. [+1.0]

REFERENCE:

STM 1-63 R2, fig. 5.
012000K406 (3.2/3.5)

012000K406 ..(KA's)

ANSWER: 020 (1.00)

a. [+1.0]

REFERENCE:

STM 1-63 R2, pp. 11, 19-20.
AA51002.006 R5, LO 6.24, pp.51-57, 71-72.
012000K402 (3.9/4.3)

012000K402 ..(KA's)

ANSWER: 021 (1.00)

c. [+1.0]

REFERENCE:

1104.036 R32, p. 13.
AA51002-016 R5, LO 16.23, pp. 35-37.
064000A206 (2.9/3.3)

064000A206 ..(KA's)

ANSWER: 022 (1.00)

b. [+1.0]

REFERENCE:

STM 1-03 R4, p. 12.
AA51002-001 R6, LO 1.24, pp. 31-32.
003000K614 (2.6/2.9)

003000K614 ..(KA's)

ANSWER: 023 (1.00)

b. [+1.0]

REFERENCE:

STM 1-65 R1, p. 1.
AA51003-015 R0, p. 2.
1202.010 R2, p.2.
Technical Specifications A 108, pp. 49-50.
000040K306 (3.4/3.9)

000040K306 ..(KA's)

ANSWER: 024 (1.00)

c. [+1.0]

REFERENCE:

1105.003 R8, p. 4.
AA51002-012 R3, pp. 24-28.
STM 1-65 R1, p. 6.
013000A301 (3.7/3.9)

013000A301 ..(KA's)

ANSWER: 025 (1.00)

d. [+1.0]

REFERENCE:

AA61002-009 R6, LO 9.5, p. 11.
Technical Specifications A164, pp 36-37, 54-55.
013000G011 (3.5/4.2)

013000G011 ..(KA's)

ANSWER: 026 (1.00)

a or d. [+1.0]

REFERENCE:

STM 1-65 R1, pp. 8, 16.
AA51002-012 R3, pp. 29, 34.
013000K409 (2.7/3.1)

013000K409 ..(KA's)

ANSWER: 027 (1.00)

a. [+1.0]

REFERENCE:

STM 1-02 R3, pp. 11-12.
AA51002-G10 R5, LO 10.17, 10.21, 10.22, 10.23, pp. 25-27, 41-44.
1203.012G R28 p. 12.
014000G015 (3.3/3.5)

014000G015 ..(KA's)

ANSWER: 028 (1.00)

a. [+1.0]

REFERENCE:

STM 1-67 R3, pp. 9-10.
STM 1-63 R2, pp, 3, 13.
015020K503 (3.3/3.7)

015020K503 ..(KA's)

ANSWER: 029 (1.00)

c. [+1.0]

REFERENCE:

STM 1-64 R2, p 59.
016000K301 (3.4/3.6)

016000K301 ..(KA's)

ANSWER: 030 (1.00)

b. [+1.0]

REFERENCE:

AA51006-008 R0, pp. 7.
STM 1-01 R3, p. 9.
STM 1-69 R1, pp. 2-4.
017020A101 (3.7/3.9)

017020A101 ..(KA's)

ANSWER: 031 (1.00)

c. [+1.0]

REFERENCE:

STM 1-09 R1, p. 2.
022000A301 (4.1/4.3)

022000A301 ..(KA's)

ANSWER: 032 (1.00)

d. [+1.0]

REFERENCE:

AA51002-007 R6, LO 7.34, pp. 45-46.
1104.031 R6, pp 2-7.
STM 1-09 R1, pp. 8-10.
022000K201 (3.0/3.1)

022000K201 ..(KA's)

ANSWER: 033 (1.00)

d. [+1.0]

REFERENCE:

AA51002-015 R5, pp. 7-8, 53-54.
016000A401 (2.9/2.8)

016000A401 ..(KA's)

ANSWER: 034 (1.00)

a. [+1.0]

REFERENCE:

STM 1-09 R1, pp. 5-7.
AA51002-030 R2, pp. 21
029000K402 (2.9/3.1)

029000K402 ..(KA's)

ANSWER: 035 (1.00)

a. [+1.0]

REFERENCE:

STM 1-15 R2, pp. 8.
AA51002-008 R5, p. 9.
000067A217 (3.5/4.3)

000067A217 ..(KA's)

ANSWER: 036 (1.00)

b. [+1.0]

REFERENCE:

STM 1-64 R2, p. 19.
AA51002-015, p. 27.
041020A102 (3.1/3.2)

041020A102 ..(KA's)

ANSWER: 037 (1.00)

c. [+1.0]

REFERENCE:

AA51002.034 R1, pp. 6-7.
011000A104 (3.1/3.3)

011000A104 ..(KA's)

ANSWER: 038 (1.00)

c. [+1.0]

REFERENCE:

STM 1-19 R2, p. 20.
1106.016 R29, p. 10.
035000G010 (3.2/3.4)

035000G010 ..(KA's)

ANSWER: 039 (1.00)

b. [+1.0]

REFERENCE:

1102.002 R55, p. 36.
035000G011 (2.9/3.7)

035000G011 ..(KA's)

ANSWER: 040 (1.00)

d. [+1.0]

REFERENCE:

STM 1-15 R2, pp. 10-11.
AA51002-024 R4, pp. 47-48.
039000K405 (3.7/3.7)

039000K405 ..(KA's)

ANSWER: 041 (1.00)

c. [+1.0]

REFERENCE:

STM 1-64 R2, pp. 26-30.
041000G007 (2.8/3.0)

041000G007 ..(KA's)

ANSWER: 042 (1.00)

d. [+1.0]

REFERENCE:

STM 1-24 R1, p. 2.
AA51002-013 R2, p. 20.
045000A402 (2.7/2.6)

045000A402 ..(KA's)

ANSWER: 043 (1.00)

c. [+1.0]

REFERENCE:

1105.004 R10, p. 9.
STM 1-19 R2, p. 16.
STM 1-64 R2, pp. 15-17, 19, 36
059000K304 (3.6/3.8)

059000K304 ..(KA's)

ANSWER: 044 (1.00)

c. [+1.0]

REFERENCE:

STM 1-66 R2, p. 57.
AA51002-024 R4, p. 25.
061000K201 (3.2/3.3)

061000K201 ..(KA's)

ANSWER: 045 (1.00)

c. [+1.0]

REFERENCE:

STM 1-32 R2, pp. 24-26.
AA51002-007 R5, LO 7.44 and 7.45, pp. 57-58.
062000K201 (3.3/3.4)

062000K201 ..(KA's)

ANSWER: 046 (1.00)

c. [+1.0]

REFERENCE:

AA51002-007, L.O. 18
062000K403 (2.8/3.1)

062000K403 ..(KA's)

ANSWER: 047 (1.00)

b. [+1.0]

REFERENCE:

STM 1-31 R1, pp. 1, 7.
064000K401 (3.8/4.1)

064000K401 ..(KA's)

ANSWER: 048 (1.00)

c. [+1.0]

RE-ERENCE:

STM 1-54 R0, p. 5.
STM 1-62 R1, pp. 27-29.
071000K106 (3.1/3.1)

071000K106 ..(KA's)

ANSWER: 049 (1.00)

b. [+1.0]

REFERENCE:

AA51002-018 R0, pp. 12-13.
072000A403 (3.1/3.1)

072000A403 ..(KA's)

ANSWER: 050 (1.00)

a. [+1.0]

REFERENCE:

STM 1-05 R3.
STM 1-42 R2.
1203.028 R12, pp. 20-22.
AA51002-020 R7, pp. 7, 9.
076000K119 (3.6/3.7)

076000K119 ..(KA's)

ANSWER: 051 (1.00)

b. [+1.0]

REFERENCE:

STM 1-67 R3, pp. 16-18.
STM 1-64 R2, pp. 16-18.
STM 1-63 R2, pp. 21-23.
ANO-1 Simulator Malfunction Document, MNI241
000001K114 (3.4/3.7)

000001K114 ..(KA's)

ANSWER: 052 (1.00)

a. [+1.0]

REFERENCE:

1203.003 R14, p. 3.
AA51002-015 R5, LO 15.48, p. 43.
000003A105 (4.1/4.1)

000003A105 ..(KA's)

ANSWER: 053 (1.00)

b. [+1.0]

REFERENCE:

AA51002-010 R5, p. 40
1105.009 R11, pp. 11, 34-35.
000005G007 (3.6/3.6)

000005G007 ..(KA's)

ANSWER: 054 (1.00)

b. [+1.0]

REFERENCE:

AA51002-015 R5, pp. 46-47.
000007A109 (3.2/3.3)

000007A109 ..(KA's)

ANSWER: 055 (1.00)

b. [+1.0]

REFERENCE:

1202.001 R24, p. 2.
000007G012 (3.3/3.6)

000007G012 ..(KA's)

ANSWER: 056 (1.00)

b. [+1.0]

REFERENCE:

STM 1-04 R3, pp. 3-17,
STM 1-05 R3, pp. 3-4.
STM 1-65 R1, p. 3.
1105.003 R8, pp. 15-16.
1202.012 R2, pp. 1-4.
000009A113 (4.4/4.4)

000009A113 ..(KA's)

ANSWER: 057 (1.00)

b. [+1.0]

REFERENCE:

1202.004 R2, pp. 2-5.
AA51003.009 R0, LO 1.4, p.10.
000011G011 (4.3/4.5)

000011G011 ..(KA's)

ANSWER: 058 (1.00)

c. [+1.0]

REFERENCE:

STM 1-04 R3, p. 15.
1203.012G R28, p. 44.
000015A107 (3.5/3.4)

000015A107 ..(KA's)

ANSWER: 059 (1.00)

b. [+1.0]

REFERENCE:

1203.028 R12, p.2-10.
AA51002-020 R7, LO 20.26, pp. 29-30.
000025G011 (3.6/3.9)

000025G011 ..(KA's)

ANSWER: 060 (1.00)

b. [+1.0]

REFERENCE:

1103.006 R13, p. 2.
1203.031 R7, p. 6.
000026A206 (2.8/3.1)

000026A206 ..(KA's)

ANSWER: 061 (1.00)

a. [+1.0]

REFERENCE:

STM 1-69 R1, p. 3.
1105.006 R6, p. 4.
AA-51002-034 R1, p. 5.
000027A215 (3.7/4.0)

000027A215 ..(KA's)

ANSWER: 062 (1.00)

b. [+1.0]

REFERENCE:

1202.012 R2, p. 18.
000024A205 (3.3/3.9)

000024A205 ..(KA's)

ANSWER: 063 (1.00)

c. [+1.0]

REFERENCE:

1203.026 R6, p. 5.
000028G011 (4.1/4.3)
000028G011 ..(KA's)

ANSWER: 064 (1.00)

d. [+1.0]

REFERENCE:

1202.012 R2, p. 6.
AA51003-013 R0, p. 1.
AA51002-024 R4, p. 67-68.
000055K302 (4.3/4.6)

000055K302 . (KA's)

ANSWER: 065 (1.00)

c. [+1.0]

REFERENCE:

1203.021 R4, p. 4.
STM 1-67 R3, p. 15.
AA51002-014 R3, LO 14.2, LO 14.3, LO 14.13, pp. 4-7, 26-27.
Technical Specifications A 56, pp. 58, 59a.
000032K301 (3.2/3.6)

000032K301 ..(KA's)

ANSWER: 066 (1.00)

c. [+1.0]

REFERENCE:

1203.021 R4, pp. 3-4.

AA51002-014 R3, LO 14.2, LO 14.3, LO, 14.13, pp. 4-7, 26-27.
TS A150, pp. 42-45.
STM 1-67 R3, p. 8.
000033A208 (3.3/3.4)

000033A208 ..(KA's)

ANSWER: 067 (1.00)

a. [+1.0]

REFERENCE:

AA51003-011 R0, pp. 12-13.
000038K306 (4.2/4.5)

000038K306 ..(KA's)

ANSWER: 068 (1.00)

c. [+1.0]

REFERENCE:

1202.006 R3, p. 13.
000038K306 (4.2/4.5)

000038K306 ..(KA's)

ANSWER: 069 (1.00)

d. [+1.0]

REFERENCE:

1202.006 R3, p. 15.
000038A215 (4.2/4.4)

000038A215 ..(KA's)

ANSWER: 070 (1.00)

a. [+1.0]

REFERENCE:

1202.003 R1, p. 5-6.
000040K107 (3.4/4.2)

000040K107 ..(KA's)

ANSWER: 071 (1.00)

a. [+1.0]

REFERENCE:

1202.003 R1, p. 3.
AA51003-008 R0, p. 5.
000011A101 (3.7/3.8)

000011A101 ..(KA's)

ANSWER: 072 (1.00)

a. [+1.0]

REFERENCE:

1203.27 R6, p. 1.
000054A205 (3.5/3.7)

000054A205 ..(KA's)

ANSWER: 073 (1.00)

c. [+1.0]

REFERENCE:

1103.006 R13, p. 2.
AA51002-001 r6, p. 25.
003000K407 (3.2/3.4)

003000K407 ..(KA's)

ANSWER: 074 (1.00)

c. [+1.0]

REFERENCE:

1202.012 R2, p. 6.
000015A121 (4.4/4.5)

000015A121 ..(KA's)

ANSWER: 075 (1.00)

d. [+1.0]

REFERENCE:

1107.002 R11, p. 28.
000056G007 (3.3/3.4)

000056G007 ..(KA's)

ANSWER: 076 (1.00)

b. [+1.0]

REFERENCE:

STM 1-68 R3, p. 4.
017020A302 (3.4/3.1)

017020A302 ..(KA's)

ANSWER: 077 (1.00)

c. [+1.0]

REFERENCE:

STM 1-54 R0, p.3.
000060A205 (3.7/4.2)

000060A205 ..(KA's)

ANSWER: 078 (1.00)

c. [+1.0]

REFERENCE:

1203.024 R7, p. 7.
000065A206 (3.6/4.2)

000065A206 ..(KA's)

ANSWER: 079 (1.00)

c. [+1.0]

REFERENCE:

STM 1-66 R2, pp. 4-5.
AA51002-024 R5, p. 68.
061000K501 (3.6/3.9)

061000K501 ..(KA's)

ANSWER: 080 (1.00)

a. [+1.0]

REFERENCE:

1203.002 R10, pp. 3, 24.
000068G011 (4.0/4.1)

000068G011 ..(KA's)

ANSWER: 081 (1.00)

b. [+1.0]

REFERENCE:

1203.002 R10, p. 19.
AA51002-003 R5, p. 54.
000068K308 (3.7/3.9)

000068K308 ..(KA's)

ANSWER: 082 (1.00)

d. [+1.0]

REFERENCE:

1203.029 R4, pp. 8-9.
000068G007 (3.4/3.5)

000068G007 ..(KA's)

ANSWER: 083 (1.00)

d. [+1.0]

REFERENCE:

1202.005 R2, p. 5.
000074K206 (3.5/3.6)

000074K206 ..(KA's)

ANSWER: 084 (1.00)

a. [+1.0]

REFERENCE:

1202.005 R2, p. 10.
000074K311 (4.0/4.4)

000074K311 ..(KA's)

ANSWER: 085 (1.00)

c. [+1.0]

REFERENCE:

1202.002 R2, pp. 7.
AA51003-007 R0, p. 5.
000009K101 (4.4/4.7)

000009K101 ..(KA's)

ANSWER: 086 (1.00)

a. [+1.0]

REFERENCE:

AA51003.016 R0, p. 5.
AA51003.001, R0 Att. B, p. 15.
000009K101 (4.2/4.7)

000009K101 ..(KA's)

ANSWER: 087 (1.00)

d. [+1.0]

REFERENCE:

1202.004 R2, p. 1.
000074A207 (4.1/4.7)

000074A207 ..(KA's)

ANSWER: 088 (1.00)

c. [+1.0]

REFERENCE:

1012.017 R0, p. 10.
194001K104 (3.3/3.5)

194001K104 ..(KA's)

ANSWER: 089 (1.00)

c. [+1.0]

REFERENCE:

1000.032 R11.
1012.026 R0, p. 12-13.
194001K113 (3.3/3.6)

194001K113 ..(KA's)

ANSWER: 090 (1.00)

a. [+1.0]

REFERENCE:

1000.027 R18, pp. 14-15, 18.
194001K108 (3.5/3.4)

194001K108 ..(KA's)

ANSWER: 091 (1.00)

d. [+1.0]

REFERENCE:

AA51002-007, L.O. 26
062000A401 (3.3/3.1)

062000A401 ..(KA's)

ANSWER: 092 (1.00)

a. [+1.0]

REFERENCE:

1202.012 R2, p. 17.
1103.006 R13, p. 3.
194001A102 (4.1/3.9)

194001A102 ..(KA's)

ANSWER: 093 (1.00)

a. [+1.0]

REFERENCE:

1015.001 R46, pp. 48-49.
194001K101 (3.6/3.7)

194001K101 ..(KA's)

ANSWER: 094 (1.00)

a. [+1.0]

REFERENCE:

1015.001 R46, pp. 17-21, 60.
194001A109 (2.7/3.9)

194001A109 ..(KA's)

ANSWER: 095 (1.00)

a. [+1.0]

REFERENCE:

1015.001 R 46, pp. 37-38.
194001A116 (2.5/3.4)

194001A103 ..(KA's)

ANSWER: 096 (1.00)

d. [+1.0]

REFERENCE:

1015.001 R46, pp. 26-28.
194001A106 (3.4/3.4)

194001A106 ..(KA's)

ANSWER: 097 (1.00)

d. [+1.0]

REFERENCE:

1202.001 R 24, p. 1.
AA51003-006 R0, pp. 3-7; LO 6.3; pp. 11-13.
194001A113 (4.3/4.1)

194001A113 ..(KA's)

ANSWER: 098 (1.00)

b. [+1.0]

REFERENCE:

1202.001 R24, p. 1.
AA51003-006 R0, p. 3.
194001A111 (2.8/4.1)

194001A111 ..(KA's)

ANSWER: 099 (1.00)

c. [+1.0]

REFERENCE:

1000.028 R17, p. 26
194001K102 (3.7/4.1)

194001K102 ..(KA's)

ANSWER: 100 (1.00)

c. [+1.0]

REFERENCE:

1012.017 R0, p 15.
194001K105 (3.1/3.4)

194001K105 ..(KA's)

(********** END OF EXAMINATION **********)

ENTERGY

Entergy Operations, Inc.
[illegible]
Jerry W. Yelverton
[illegible]

March 11, 1994

RER-94-00055

Mr. Joe Callan
Regional Administrator
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

SUBJECT: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
Initial Reactor Operator Written Exam

Dear Mr. Callan:

The Initial Reactor Operator written exam, administered to the Unit 1 Candidates March 1, 1994, was considered to be challenging. The exam was a good tool for determining the candidate's ability to operate a nuclear power plant. The pre-review comments during the week of February 14, 1994, were incorporated as stated and we feel this review was instrumental in ensuring an accurate and technically correct exam.

A post exam review was conducted and only 3 questions on the written, we feel, require commenting on. One was pointed out just prior to the examination, but there was no time to correct the question prior to the exam. This question was researched further by the training staff after returning from the Arlington exam review. Due to the fire in the NRC building in Arlington, the NRC evaluator could not be contacted prior to arrival. Another question was re-written during the pre-examination review but the correct answer was not updated on the key. The last one was simply overlooked during the pre-exam review as having two correct answers.

During the administering of the JPM's a question was uncovered that came from a deleted procedure. We have attached our procedure index showing this procedure deletion.

Should you require further information, please contact Bob Byford at (501) 964-6844.

Sincerely,

J. W. Yelverton

By Donald P. Denton

Attachments
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CMS File - Licensing

ANO-DCC

QUESTION: 011 (1.00)

WHICH ONE (1) of the following valves fails CLOSED on loss of instrument air?

a. Demineralizer bypass valve, MU-9.

b. Letdown orifice bypass valve, CV-1223.

c. Letdown orifice isolation valve, CV-1222.

d. Purification demineralizer inlet valve, CV-1245.

ANSWER: 011 (1.00)

d. [+1.0]

REFERENCE:

STM 1-04 R3, pp. 6, 8, 14-15.
1203.024 R7, pp. 15-16.
078000K302 (3.4/3.6)

078000K302 ..(KA's)

On question 11, per the reference material 1203.024 there are two correct answers "b" and "d". Per the same reference material recommend the following changes:

On choice "b" change the optional valve number to "RC pump seals total injection flow valve, CV-1207, as follows:

WHICH ONE (1) of the following valves fails CLOSED on loss of instrument air?

a. Demineralizer bypass valve, MU-9.

b. RC pump seals total injection flow valve, CV-1207

c. Letdown orifice isolation valve, CV-1222.

d. Purification demineralizer inlet valve, CV-1245.

ATTACHMENT B

MAJOR AIR OPERATED COMPONENTS AND ISOLATION VALVES

COMPONENT	DESCRIPTION	PREFERRED ISOLATION	BACKUP ISOLATION	FAILURE POSITION
A MFWP	Main Feedwater Pump A	IA-623	IA-554*	ZERO SPD
B MFWP	Main Feedwater Pump B	IA-568	IA-75*	ZERO SPD
CV-1207	RC Pump Seals Total INJ Flow	IA-217	IA-218*	OPEN
CV-1222	Letdown Orifice Block	IA-216*	IA-218*	AS IS
CV-1223	Letdown Orifice Bypass	**	IA-218*	CLOSED
CV-1235	Pressurizer Level Control	IA-216*	IA-218*	CLOSED
CV-1244	Purif. Demineralizer Inlet (T-36A)	IA-262*		CLOSED
CV-1245	Purif. Demineralizer Inlet (T-36B)	IA-262*		CLOSED
CV-1246	Makeup Filter Inlet (F-3A)	IA-223*	IA-246*	CLOSED
CV-1247	Makeup Filter Inlet (F-3B)	IA-223*	IA-246*	CLOSED
CV-1249	Batch Controller Flow CNTRL VLV	IA-269*		CLOSED
CV-1250	Batch Controller Outlet	IA-269*		CLOSED
CV-2214	Nuclear ICW Outlet	IA-463	IA-85*	AS IS
CV-2233	Nuclear ICW Inlet	IA-467	IA-85*	AS IS
CV-2234	Non-Nuclear ICW Inlet	IA-462	IA-85*	AS IS
CV-2238	ICW Pumps Discharge Crossconnect	IA-164*		CLOSED
CV-2239	ICW Pumps Discharge Crossconnect	IA-164*		CLOSED
CV-2240	ICW Pumps Suction Crossconnect	IA-164*		CLOSED
CV-2241	ICW Pumps Suction Crossconnect	IA-164*		CLOSED

* Isolates additional components listed in Attachment C.

** CV-1223 isolation is located in LNPR, north wall, behind CV-1223. Pear has been submitted to obtain valve number.

QUESTION: 026 (1.00)

WHICH ONE (1) of the following will trip an ESAS analog channel?

a. Placing the rotary switch on the pressure test module to "test operate".

b. Operating the toggle switch on a unit control module.

c. De-energizing the logic buffer trip relay.

d. Taking a pressure test module out of "operate".

ANSWER: 026 (1.00)

c. [+1.0]

REFERENCE:

STM 1-65 R1, pp. 8, 16.
AA51002-012 R3, pp. 29, 34.
013000K409 (2.7/3.1)

013000K409 ..(KA's)

On question 26, answers "A" and "D" are both correct and will trip the analog channel when taken out of the "operate" position as stated in paragraph 3.3.7.2 of reference material STM 1-65, pp. 8. Answer "C" is what occurs when the analog channel is tripped which is not necessarily and operator action that would trip the analog channel.

Suggest the following:

Change the "C" choice to removing a module as stated on page 8 of same reference material and then ask which one will NOT trip an ESAS analog channel as follows. The correct answer will now be "b".

WHICH ONE (1) of the following will **NOT** trip an ESAS analog channel?

a. Placing the rotary switch on the pressure test module to "test operate."

b. Operating the toggle switch on a unit control module.

c. Removing the pressure buffer amplifier module.

d. Taking a pressure test module out of "operate."

3.3.7 Module-Removal/Module-In-Test Interlocks

3.3.7.1 Module Removal

Each analog channel instrument module has an internal jumper. It is in series with the internal jumpers of the other modules. This series arrangement provides a module removal interlock circuit.

Removal of a module breaks the module removal interlock circuit's continuity. A module-removal/module-in-test relay is deenergized. This operates contacts to deenergize the logic buffer trip relay.

Deenergizing the logic buffer trip relay has the same consequences as tripping a bistable. A trip signal is passed to the digital subsystem.

When a module is removed from an analog channel, one trip signal will be sent to at least four digital channels. Depending on the module removed, a trip signal could be provided to as many as all ten digital channels.

Examples:

> The 1526 psig RCS pressure bistable in channel 1 is removed. A trip signal is sent to digital channels 1, 2, 3, and 4.
>
> The 4 psia RB pressure bistable in channel 1 is removed. A trip signal is provided to digital channels 1, 2, 3, 4, 5, and 6.
>
> The RB pressure buffer amplifier in channel 1 is removed. A trip signal is provided to all ten digital channels.

In each example, the affected digital channels are placed in a one-out-of-two trip condition. Only one more signal is required for the affected digital channels to trip.

This does not apply for the removal of a logic buffer module. Removal of a logic buffer eliminates the communications link between the analog and digital channels. This prevents a trip signal from being provided to the digital subsystem from the channel for that particular logic buffer's function (LPI, HPI, etc.).

The two digital channels associated with the removed logic buffer are placed in a less conservative configuration. Their logic would be two-out-of-two. Both of the other channels would have to trip to get actuation of the required digital channels.

Removal of a logic buffer is annunciated.

3.3.7.2 Module In Test

Except during testing, test modules are required to be in the operate position. In other positions, signals other than the monitored variable can be provided to the channels instrumentation. This could place ESAS in a non-conservative two-out-of-two coincidence logic. In this condition, a single failure could prevent ESAS from actuating.

If a pressure test module is not in "OPERATE", the associated module-removal/module-in-test relays are deenergized. For RCS pressure, the relays in the HPI and LPI logic buffers will be deenergized. When the RB pressure test module is out of "OPERATE", all five module-removal/module-in-test relays are deenergized. This results in one analog channel trip signal to all ten digital trip modules.

3.4 Digital Subsystem

3.4.1 Cabinets and Arrangement of Channels

The digital subsystem's ten actuation channels are divided into two groups. This provides separation of redundant ES functions. All equipment required to perform a specific function, such as a pump and its associated valves, are assigned to the same group.

Channels 1, 3, 5, 7, and 9, the odd channels, are assigned as one group. Their logic and actuation circuitry are housed in panels C86 and C87.

noise or small oscillations present in the output signal. When the reset value is reaches, the bistables using the feature will automatically reset.

The only ESAS bistables using this feature are those used to bypass the low RCS pressure actuation.

A memory circuit is included to indicate whether the bistable has been tripped. This circuit is manually reset on all bistables after they have tripped.

A bistable is packaged in a standard 2 unit wide module. On the front plate are lights to indicate the trip state of the bistable and the state of the bistable memory. There are two potentiometers with turn counting dials. One is used for adjusting the setpoint. The other is for the reset deadband. Test jacks are provided for measuring input, setpoint, and deadband.

4.4 Contact Buffers

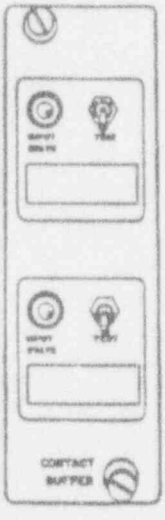

Figure 65-14

Contact buffers provide electrical isolation for signals originating outside ESAS. This assures that faults in the external circuit will not adversely affect ESAS. This electrical isolation is obtained by using the principle of impedance in transformers. (Discussion 65-21).

A contact in the secondary circuit of a transformer controls the a relay in the primary side circuit. This is accomplished with no direct electrical connection between the contacts and the relay.

The relay, in turn, operates contacts that are used to provide signals for ESAS, in both the analog and digital channels.

Front plate layout includes two neon indicating lamps and two toggle switches. The contact buffers are used for a variety of purposes in RPS and ESAS. Different internal wiring arrangements are available. Because of this, the state of the contact buffer lamp can vary from one application to the next. The primary purpose of the logic buffer lamp is to show the state of internal components during testing.

If a path for current flow exists on the secondary side of a transformer, then impedance is low; If there is no path for current flow on the secondary side of the transformer, impedance is high, blocking or reducing current flow on the transformers primary.

Discussion 65-2

4.5 Logic Buffers

The logic buffer modules provide the communication links between analog and digital subsystems. The links are between analog channel bistable modules and digital channel actuation logic.

There are five logic buffer modules in each of the ESAS analog channels. One is provided in each channel for each of the engineered safeguards functions.

- HPI and diverse containment isolation
- LPI and diverse containment isolation

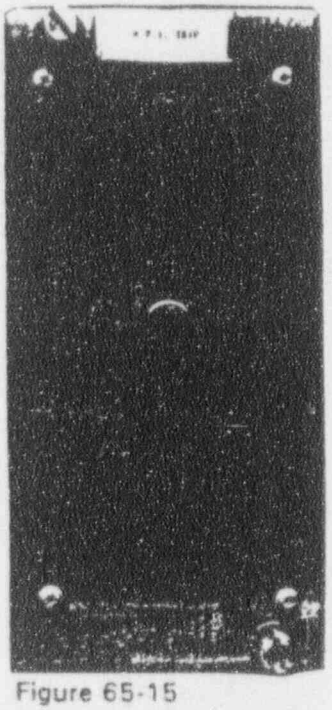

Figure 65-15

- Reactor building cooling and isolation
- Reactor building spray
- Reactor building spray chemical addition

Each logic buffer module contains a normally energized trip relay. The trip relay is deenergized by contacts opening in the associated bistable or bistables. The relay closes two contacts when it deenergizes. This applies a signal to trip logic modules in two of the ten ESAS digital channels.

A normally energized module removal/test relay in the is included in the logic buffer modules. (See discussion section on Module-Removal/Module-In-Test Interlock)

4.6 Auxiliary Relays

Auxiliary relays are used to "fan-out" signals, to provide multiple external signals from fewer internal signals. Each lamp provides indication of the state of an internal relay. Each relay may operate multiple contacts.

Auxiliary relays also serve to electrically isolate ESAS from external circuits.

A common use of auxiliary relays in ESAS and RPS is to provide signals for computer and annunciator alarms

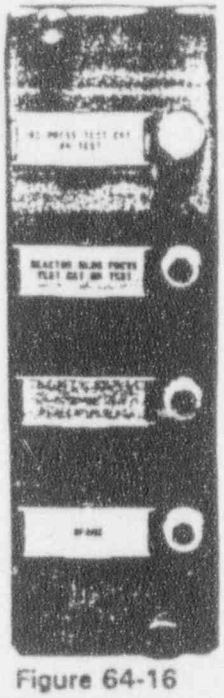

Figure 64-16

4.7 Trip Logic Modules

Trip logic modules contain the two-out-of-three coincidence logic circuitry. They also contain circuitry required for testing.

A trip logic module has nine lamps. One of these, the reset light, is normally lit (showing that the reset contact is closed.) The lamp next to it is lit if one or both of two manual trip relays are energized.

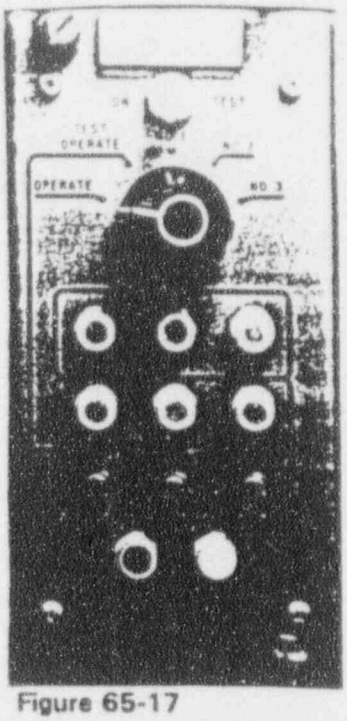

Figure 65-17

There are two rows of three lamps in each. The top row of three shows which set of coincidence contacts has a contact closed when lit. With one analog channel tripped two lights will be lit.

The second row of three lamps shows which analog channel inputs to the trip logic module are tripped when lit.

The ninth light is provided to indicate when the test switch is not in the operate position.

4.8 Unit Control Modules

One lamp is provided for each unit control circuit, two lamps per module. The lamp shows the status of the output relay of the circuit.
If the lamp is on, the relay is energized and an ES signal is present in the control circuits of the components actuated by that unit control circuit.

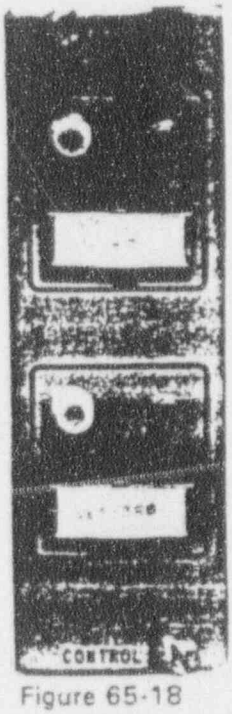

Figure 65-18

QUESTION: 095 (1.00)

WHICH ONE (1) of the following operators has exceeded overtime limits as established in Operations Administrative Procedure 1015.001, "Conduct of Operation"?

a. Operator A works 12 on shift and 5 hours in remedial training in a 24 hour period.

b. Operator B works two 12 hour shifts in a 48 hour period.

c. Operator C works four 12 hour shifts and three 8 hour shifts during his week on mid shift.

d. Operator D works holds over for 4 hours all 5 days of his day shift.

ANSWER: 095 (1.00)

d. [+1.0]

REFERENCE:

1015.001 R 46, pp. 37-38.
194001A116 (2.5/3.4)

194001A103 ..(KA's)

Question 95 is a question that was re-written during the pre exam review for clarification. The correct answer was changed from "d" to "a" during the re-write and the answer key was not updated to represent this change. The question is good as it stands but the key needs to be updated to "a" being the correct answer as shown per the reference material 1015.001, R 46, on pages 37 and 38.

10.13 Periodically, both the Shift Relief Sheets and the Shift Turnover Checklists should be forwarded to Records Management for retention.

10.14 Upon assuming operational responsibility, the Waste Control Operator and Auxiliary Operator shall make a tour of their assigned areas as soon as practical.

11.0 OVERTIME CONTROL

11.1 Unscheduled overtime which may result from illnesses and create an unforeseen vacancy on shift shall normally be filled as follows:

11.1.1 IF there is sufficient personnel on shift to meet the minimum shift complement (See Attachment 1) AND they are currently qualified for the stepped up position,
THEN first preference should be temporary step up of operators on the shift where the temporary vacancy occurs.

11.1.2 IF an operator is NOT available for step up on the shift where the vacancy occurs,
THEN an operator qualified in the classification where the vacancy occurs will work over an additional four hours, covering half the vacant shift.

11.1.3 IF an operator is required to work an additional four hours to cover half the vacant shift,
THEN the Shift Superintendent shall ensure an operator qualified in the same classification, from the crew scheduled to relieve the vacant shift is called in four hours early.

11.1.4 WHEN overtime is required,
THEN the constraints on overtime listed in Step 11.2.2 should be used as guidance in selecting personnel for overtime duties.

11.2 Scheduled overtime, which may occur from prescheduled vacancies resulting from extended illness or vacation of shift personnel, shall be arranged according to the following guidelines:

11.2.1 IF the scheduled vacancy can be filled without the use of overtime or loss of scheduled training,
THEN overtime should NOT be used.

11.2.2 IF overtime must be used for filling scheduled vacancies on shift,
THEN the following limits should be applied:

- An individual should not be permitted to work more than 16 hours straight (excluding shift turnover time)

- An individual should not be permitted to work more than 16 hours in any 24 hour period, nor more than 24 hours in any 48 hour period, nor more than 72 hours in any seven day period (all excluding shift turnover time)
- A break of at least eight hours should be allowed between work periods (including shift turnover time)
- Except during extended shutdown periods, the use of overtime should be considered on an individual basis and not for the entire staff on shift

11.2.3 IF due to unforeseen events it becomes necessary to deviate from the above four limits to maintain the minimum shift complement,
THEN ensure the following:

- Each case shall be approved by the General Manager, Plant Operations or the Unit Plant Manager
- Each case shall be documented in the Station Log

12.0 STATUS BOARDS

12.1 The following Status Boards are maintained:

- Plant/Safety System Status Board
- WCO
- AO

12.2 The Shift Superintendent/CRS is responsible for ensuring proper entries are made on the Plant/Safety System status board.

12.3 Safety Systems removed from service shall be entered on the Plant/Safety System status board.

12.4 WCO and AO status board entries shall NOT take the place of required Plant/Safety System status board entries.

12.5 Status boards for Waste Control Operators and Auxiliary Operators may serve the function of a Shift Relief Sheet for these positions.

12.6 Status boards should have entries made whenever special operating consideration must be given a specific system or component related to the watch station.

One Administrative topic question asked about entry into the reactor building without additional dosimetry. The referenced procedure series has been superseded. The current requirements are in procedure 1601.300, step 6.4.

Job Coverage allows entry into the Reactor Building under "emergency conditions" using regular issue TLD's, which are neutron sensitive. The superseded requirements were for regular issue TLD's that were not neutron sensitive.

DOCNO	DRVTYP	DRVNO	DDATE	DRVEFF	DOC-SUBJECT	DOCKEY	DSAFCL	DXDOC	DEQUIP
OP-1618.011	AP	02		880829	SAMPLING PREPARING NEUTRALIZING TANK	A72302	NS		
	PC	01		911018					
	PC	02		920506					
	PC	03		930319					
	PC	04		930913					
	PC	05							
OP-1618.012	AP	04		930907	SAMPLING SU BO ER	A72303	NS		
	PC	01		931019					
	PC	02		931210					
OP-1618.014	AP	07		921015	SAMPLING EDG COOLING WATER	A72305	SA	BIENNIAL	
OP-1618.020	AP	03		881214	SAMPLING MAIN CONDENSER ANO-1	P1673	NS		E-001
	PC	01		930826					E-001
	PC	02							
OP-1618.021	AP	03		940124	SAMPLING FW LO ANO-1	P1674	NS	MODEL-A	
								MODEL-B	
OP-1618.022	AP	03		940124	SAMPLING TG LO ANO-1	P1675	NS		
OP-1618.023	AP	02		931008	SAMPLING CONDENSATE POLISHER STORAGE TANK ANO-1	P1676	NS		T-005
OP-1618.024	AP	01		930930	SAMPLING TRNG CENTER DIESEL FUEL OIL TANK	P1677	NS		
OP-1618.025	AP	02		881214	SAMPLING INDIVIDUAL CONDENSATE POLISHER ANO-1	P1678	NS		T-005
	PC	01		931008					T-005
	PC	02							T-005
									T-005
									T-005
									T-005
OP-1618.027	AP	03		931206	SAMPLING ELECTROHYDRAULIC CONTROL EHC FLUID ANO-1	P2770	NS		
OP-1618.028	AP	03		920521	SAMPLING ED DAY TANK	P2833	SA	BIENNIAL	T-003
	PC	01		940106					T-003
	PC	02							
OP-1618.029	AP	03		930909	SAMPLING ANO-1 SW	P3210	NS		
OP-1618.030	AP	03		930129	SAMPLING EMERGENCY FIRE DIESEL COOLING WATER	P3433	SA	BIENNIAL	K-000
OP-1618.031	AP	02		910208	SAMPLING SECURITY DIESEL COOLING WATER	P3461	NS		K-000
	PC	01		920506					
OP-1618.032	AP	04		910208	SAMPLING TRNG CENTER DIESEL COOLING WATER	P3462	NS		K-000
	PC	01		920506					
OP-1618.033	AP	01		881214	SAMPLING HEATER DRAIN TANK ANO-1	P3655	NS		T-004
	PC	01		931008					T-004
	PC	02							E-001
									E-001
									E-001
									E-001
OP-1618.034	AP	01		881214	SAMPLING MSR ANO-1	P3656	NS		
	PC	01		931008					
	PC	02		931128					
	PC	03							
OP-1618.035	AP	03		920514	SAMPLE ANALYZE DIESEL FUEL OIL TRANSPORT	P3658	NS		
	PC	01		940106					
OP-1618.036	AP	01		931026	SAMPLING CST ANO-1	P3808	NS		T-004
									T-004
OP-1618.037	AP	00		880928	SAMPLING A & B LP TURBINE STEAM	P3994	NS		
	PC	01		930826					
	PC	02		931008					
	PC	03							
OP-1618.039	AP	00		931023	SAMPLING ANO-1 DG LOL	P9844	SA		
OP-1622.000					SERIES TITLE GENERAL RAD WORKER PROCEDURE	A72173			
OP-1628.000					SERIES TITLE SYS OP PROCEDURE	A72267			

6.3.2. N. 4. Restore the radiography area to former conditions by removal of radiography postings.

5. Escort the source to its storage area.

6.4 JOB COVERAGE FOR REACTOR BUILDING POWER ENTRIES

NOTE

Except in emergency situations or as approved by Supervisor, Health Physics, the initial power entry will be performed by Health Physics personnel to obtain environmental samples and survey information.

6.4.1. Required Preparations for Reactor Building Power Entries:

A. Upon notification that a power entry is required, determine if entry to be made is of an emergency nature.

B. IF entry is considered an emergency, THEN proceed with step 6.4.4 of this procedure.

C. Notify duty or on-call Health Physics Supervisor. A Health Physics Supervisor is required to be on site for all entries.

D. Initiate following documentation:

1. Specific RWP for the entry approved by:

a. The RWP writer
b. Independent Reviewer (not RWP writer)
c. HP Supervisor (not independent reviewer)

Independent Reviewer shall sign file copy of RWP.

2. Form 1601.300A, "Reactor Building Power Entry Check-Off List" approved, as required, by:

a. Superintendent, Health Physics Operations, or designee for entries outside the bio-shield, 354 elevation and above, excluding the refueling canal.

b. Manager, Operations, or designee, of applicable unit must approve entry. Shift Superintendent can initial that permission has been obtained.

c. Applicable Plant Manager and Manager, Radiation Protection/Radwaste for entry below the 354' elevation, inside bioshield or refueling canal.

6.4.1. E. Prior to allowing entry into either Reactor Building at power, verify that the personnel escape hatch is capable of being operated or that an alternate escape plan has been developed and approved by the PSC. (PSCA-91-132-01)

F. Due to the variations in neutron energies and the energy dependence of neutron TLDs, a review of available survey data along with personnel dose received from previous entries into the area of concern, if available, should be made and an evaluation performed prior to the entry. The possibility of a TLD vs calculated neutron dose discrepancy occurring is considered when calculating stay-times.

6.4.2 Initial Reactor Building Entry

NOTE
Initial entries into the Reactor Building at power require the use of SCBAs.

A. Notify the appropriate Shift Superintendent each time personnel enter and exit containment building.

B. Ensure back-up personnel and control point personnel are stationed and are aware of their responsibilities concerning the entry.

WARNING
Failure to perform tests for explosive atmosphere prior to obtaining radiological air sample can result in an explosion and subsequent personnel injury.

C. Obtain sample for combustible atmosphere.

D. IF results of air sample indicate greater than or equal to 10% LEL, DO NOT obtain radiological air sample as directed in step 6.4.2.F.

E. Obtain % oxygen sample. An oxygen reading of less than 19.5% indicates an oxygen deficient atmosphere. Terminate the entry if % oxygen indicates less than or equal to 16%.

F. Obtain radiological air sample and required survey information in accordance with 1601.301, "Radiological Surveys". The air sample shall include particulate, iodine, tritium, and Noble Gas.

6.4.2. G. During the initial entry, obtain neutron dose rate and time information necessary to complete Section 2 of Form 1601.201B, "Neutron Dose Tracking/Assignment Form".

1. Note the time entry is made into the containment building and the time of arrival at the area where the environmental samples are to be taken.

2. Note the average neutron dose rates encountered in route to the area where the samples are to be taken.

3. Note the dose rate at the sample location and the total time spent at that location, as well as, the neutron dose rate at the location.

4. Note the time upon leaving the sample location, the time exiting the containment building, and the average neutron dose rate observed while exiting.

5. Upon exiting the reactor building, record the information, noted above, on the Form 1601.201B for each individual making the entry.

6. Prior to returning the neutron TLDs to dosimetry, each Health Physics Technician providing information on a particular form, sign and date the form and deliver to a Supervisor, Health Physics for review.

6.4.3 Reactor Building Power Entries

A. Ensure RWP documents survey and air sample information. When possible, this should be the latest or initial entry survey information.

B. Complete documentation specified in step 6.4.1 of this procedure, as appropriate.

C. Ensure control point is stationed and back-up personnel are present.

D. Notify the appropriate Shift Superintendent each time personnel enter and exit containment building.

6.4.3. E. The Health Physics technician(s) covering the power entry leads the entry team at all times.

F. IF it has been greater than 24 hours since last air sample was taken, OR
IF primary leakage has increased significantly since last air sample,
THEN obtain a complete set of air samples upon entry.

G. DO NOT allow entry into:

1. areas not specified on the RWP, OR

2. areas which have not been surveyed or evaluated.

H. Obtain neutron dose rate and time information required by 6.4.2.G. to complete Section 2 of Form 1601.201B, "Neutron Dose Tracking/Assignment Form".

6.4.4 Emergency Reactor Building Power Entries

A. An "EMERGENCY ENTRY" is permitted when entry into an Action Statement time allowance for corrective measures prior to plant shut-down of four hours or less is imminent or has occurred.

B. Initiate Form 1601.300A, "Reactor Building Power Entry Check-off List".

NOTE

Only information immediately available needs to be provided on the form prior to the entry. The remainder of the information will be provided at the conclusion of entry.

C. Verify that an "EMERGENCY ENTRY" has been approved by the applicable Plant Manager, or designee.

D. Obtain and prepare necessary equipment.

E. Entry may be performed without an RWP if an "EMERGENCY ENTRY" is required. OTHERWISE, prepare RWP in accordance with step 6.4.1.

6.4.4. F. Health Physics will brief all personnel participating in the entry on specific radiological controls to be used during entry when an "EMERGENCY ENTRY" is to be made without preparing an RWP,

G. Regular issue TLDs are to be used when an "EMERGENCY ENTRY" is required. OTHERWISE, obtain neutron TLDs prior to entry.

H. Check out keys for reactor building Personnel or Emergency Escape Hatch in accordance with 1012.017, "Radiological Posting and Entry/Exit Requirements".

I. Notify the appropriate Shift Superintendent each time personnel enter and exit the containment building.

J. Ensure back-up personnel and control point personnel are stationed and are aware of their responsibilities concerning the entry.

```
##################################################################################
#                                  WARNING                                       #
#   Failure to perform tests for explosive atmosphere prior to obtaining         #
#   radiological air sample can result in an explosion and subsequent            #
#   personnel injury.                                                            #
##################################################################################
```

K. Obtain sample for combustible atmosphere.

L. IF results of air sample indicate greater than or equal to 10% LEL, DO NOT obtain radiological air sample as directed in step N, below.

M. Obtain % oxygen sample. An oxygen reading of less than 19.5% indicates an oxygen deficient atmosphere. Unless the entry involves personnel rescue operations, terminate the entry if % oxygen indicates less than or equal to 16%.

N. Obtain radiological air samples in accordance with 1601.301, "Radiological Surveys" to include particulate, iodine, tritium, and Noble Gas.

O. Obtain neutron dose rate and time information required by 6.4.2.G to complete Section 2 of Form 1601.201B, "Neutron Dose Tracking/Assignment Form".

6.4.4. P. On entries where multiple locations are visited for short durations, such as walkdowns or operators' tours, use either of the following to complete 1601.201B forms:

1. The total time spent in the building and the average dose rate observed, OR

2. The total time spent on each elevation and the average dose rate observed on each elevation.

Q. Upon completion of entry made without an RWP:

1. Initiate an RWP to describe all radiological controls employed, document radiological conditions of area(s) entered, and account for doses received.

2. Initiate condition report.

6.5 JOB COVERAGE FOR STEAM GENERATOR (PRIMARY SIDE) ENTRIES

6.5.1 Prerequisites for Steam Generator (Primary Side) Entries

****
* CAUTION *
* Removal of manway and handhole diaphragms allow access to extremely high radiation fields. Failure to adequately control the diaphragms and the openings to the steam generators can result in doses in excess of administrative dose control levels (ADCLs). *
****

NOTE

Use of the polar crane or other rigging to remove the manway covers on the steam generators will require that they be removed prior to the installation of a total containment. Ventilation cannot be established until the manway cover and diaphragm have been removed or collapse of the vent trunk/duct will result.

A. Erect a containment pen or tent upon removal of the primary manway cover, and prior to removal of the diaphragm.

B. Unless otherwise directed by HP Supervision, establish ventilation on the generator using either a HEPA unit or the Reactor Building exhaust ventilation.